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Competitiveness- Now Key

Now is the key time to bolster NASA and reassert US space dominance

Abbey & Lane 09 (George, former director of the Johnson Space Center (JSC) & Neal, Prof of Physics and Astronomy at Rice University, http://carnegie.org/fileadmin/Media/Publications/PDF/spaceUS.pdf 6/22/11) HD

If we were correct in our earlier paper to assert that the space program and NASA were at a critical juncture in 2005, in 2009 the future of the U.S. space program is very much in doubt. The narrow vision of the Bush administration in launching VSE and its subsequent failure to fund the effort adequately have led to serious questioning of the nation’s commitment to space and, consequently, to a steady erosion of NASA and the aerospace industry that supports its missions. NASA has been trapped by expectations it could not meet and promises not kept. Morale at NASA is at a low point, many of the agency’s most experienced workers are retiring, and NASA, as well as U.S. aerospace companies, faces dire manpower challenges. President Barack Obama’s early decisions regarding NASA will determine whether the United States continues to lead in space or cedes that position to other nations.

Space Program Key to Competitiveness

Space program is key to competitiveness – if we don’t seize the high ground China, Russia and India will.

Messier 11 (Doug, Journalist with a degree in Science, Technology and Public Policy from George Washington, Feb 8, http://www.parabolicarc.com/2011/02/08/house-members-cut-nasas-climate-research-fund-human-spaceflight/ 6/22/11) HD

Our space program attracts and inspires the world’s greatest minds and gives our young people inspiration to excel in math and science. Human spaceflight, however, is not simply a matter of national prestige. Our nation’s ability to access space is a critical national security asset and plays an important role in our future economic competitiveness. Space is the ultimate high ground and nations such as China, Russia, and India are anxious to seize the mantle of space supremacy should we decide to cede it.â€ â€œLimited resources force us to make important decisions with regard to the objectives of all federal departments and agencies, including NASA,â€ said Representative Bill Posey (R-FL). â€œNASAâ€™s primary purpose is human space exploration and directing NASA funds to study global warming undermines our ability to maintain our competitive edge in human space flight.â€ â€œAs NASAâ€™s human spaceflight program hangs in the balance, it is imperative that we ask ourselves: What is the future of NASA? With the current administration unable or unwilling to outline a plan or stick to their original promises, it is time to refocus NASA’s mission towards space exploration,â€ said Representative Sandy Adams (R-FL). â€œThat is why I am encouraging Chairmen Rogers and Wolf to reduce funding for climate change research, which undercuts one of NASAâ€™s primary and most important objectives of human spaceflight.â€ â€œIt is counterintuitive to direct millions of dollars to NASA for duplicative climate change programs and at the same time cancel its manned space flight program – the purpose for which the agency was originally created. Far too many forget that at one time in our nationâ€™s history we were losing the space race. With the creation of NASA, we emerged as leaders and have remained so ever since. If NASA’s manned space program disappears, our nation will once again experience a â€˜Sputnik Moment.â€™ Our country will again watch from the sidelines as countries like Russia, China and India charge ahead as leaders in space exploration and missile defense,â€ said Representative Rob Bishop (R-UT).

Space R & D key to Competitiveness

New space R&D is key to spur global competitiveness

Braun 11 (Robert, NASA Chief Technologist, April 20, http://mitworld.mit.edu/video/914, 6/22/11) HD

The recently minted NASA Space Technology Program (STP), under Braun’s wing, intends to seed R&D ventures -- whether in early stage innovation, experimentation or pilot demonstrations -- that may ultimately solve the kinds of problems hampering human space exploration. The program will also yield numerous other benefits, Braun predicts, in many other areas of science and engineering. These investments in disruptive technologies will pay off in turn by creating spinoff high tech industries, spurring new jobs, economic growth and global competitiveness.

Competitiveness I/L: Laundry List

Mars exploration is key to competitiveness- promotes education, economy, energy, and technology.

Whitesides, exec director National Space Society, 8

(George, Testimony to Congress, May 7, LexisNexis, JT)

Our nation's human spaceflight program can be about more than just being "great," it can also be about being "good," by meeting the urgent needs of all Americans and the planet as a whole. Such efforts offer NASA a vision the public will follow for the long haul, embracing as it does both economic opportunities for individuals and technological benefits for the common good. The nation faces an historic opportunity with regard to space this year. In a time of uncertainty, Congress and the next president can use human space exploration as a means to advance and improve this nation as part of a sustained commitment to solving the challenges we face today. Space exploration can provide a common keystone for the many issues confronting us today, from education to economic uncertainty to energy production, planetary health and safety, international cooperation, and economic competitiveness. A re-authorized Vision for Space Exploration, with the recommendations I've suggested, would be an excellent starting point for building a truly spacefaring civilization. Therefore, I encourage you to continue supporting human exploration beyond LEO, and onwards to Moon, Mars, and beyond.

Competitiveness I/L: Spinoffs

Mars leads to spinoff technology advances which are key to competitiveness

Urban, staff writer at Gannett Washington Bureau, 9

(21 October, Ganett News Service, p. ARC, LexisNexis, JT)

Nelson, who heads the Senate's science and space subcommittee, assembled the hearing Wednesday to promote the commercial, research and patriotic value of space exploration so that policymakers in the White House "recognize that space pays dividends." Dr. Stephen Katz of the National Institutes of Health pointed to two notable medical technologies that have come directly from NASA: a heart pump that can be used while a person waits for a heart transplant and a fiber optic probe that can reveal early signs of cataracts. And Helen Greiner, former president of iRobot Corp., told the panel that NASA was instrumental in moving her company from a startup to a publicly traded company that has sold more than 3 million Roombas to date. The autonomous household vacuum cleaners rely on robotic technology designed for Mars exploration. The tiny brains in these robots, which mirror those of insects, changed the way robots are designed, she said. "NASA funding is a proven investment in U.S. competitiveness," she said. Dr. Jeanne Becker, associate director of the National Space Biomedical Research Institute, said that research conducted on the International Space Station has led to a breakthrough in developing a vaccine for salmonella. Research in near-zero gravity found that salmonella grew more rapidly there. By altering specific genes, researchers were able to block the growth, providing a pathway for a vaccine. "So we hit a home run," she said. Lennard A. Fisk, a professor of space science at the University of Michigan, said that the space program touches the lives of every American. "We are dependent upon GPS signals for transportation; we coordinate our telecommunication networks, Internet infrastructure and electric grid and financial systems through the timing signals available from GPS. Our weather forecasts are based upon satellite observations. We have information on what is happening everywhere in the world at all times, in large measure due to satellite communications and observations," he said. But beyond the tangible gains, Fisk said, space exploration is needed to inspire future generations.

Competitiveness I/L: Skilled Workers

Mission to Mars maintains a highly skilled workforce which is key to global competitiveness.

Space Daily 10

(19 April, LexisNexis, JT)

The President's announcement that NASA will undertake the development of a heavy-lift vehicle for deep space missions to specific destinations, including asteroids and Mars, provides some clarity to the future direction of space exploration, planned by the Administration. We commend the President's efforts to help mitigate some of the job losses associated with the retirement of the Space Shuttle program and restructuring of Constellation. This highly skilled workforce is essential to the sustainment of our nation's preeminence in space, economic, and national security and global competitiveness. The erosion of this skill base would seriously affect the nation's industrial base and national security strategies.

Space exploration is key to competitiveness- development of technology and a skilled workforce

Aldridge 04 (E.C., Chair of the President’s Commission on Implementation of United States Space Exploration Policy, June, http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf 6/22/11) HD

Much of the United States’ current military strength and economic security rests on our technology leadership. Our technological and industrial base must constantly be renewed. Therefore, the United States must continue to lead, especially in those industries that require, and therefore build, technology skills. In addition to the aerospace industry itself, implementation of the space vision will rely upon, and thus drive, a broad spectrum of technology-driven disciplines, such as medical research, biotechnology, computing, nanotechnology, advanced composite manufacturing, and many others. Economic security is also a function of long-term competitiveness. Although the era of Sputnik has given way to an age of international cooperation in space, it remains a competitive frontier. The President rightfully indicated that the vision calls for “a journey, not a race” and he invites “other nations to join us on this journey, in the spirit of cooperation and friendship.” But with any journey, someone must chart the course and then lead the way. Other nations, against whom we compete for jobs in the global economy, are also intent on exploring space. If not us, someone else will lead in the exploration, utilization and, ultimately, the commercialization of space, as we sit idly by.

Long-term competitiveness requires a skilled workforce. The space exploration vision can be a catalyst for a much-needed renaissance in math and science education in the United States. The ability of our children to compete and prosper in the 21st century continues to decline. Comparing our competence with that of other nations in math, science, computer literacy, and engineering – 21st century equivalents of the 3Rs – we are becoming less, not more, competitive. 1 To compete in a knowledge economy, high-tech industries require these particular skills. The space exploration mission can be an important part of our national effort to galvanize and reform our educational system.

Competitiveness I/L: STEM Education

Space exploration is key to STEM education which is key to competitiveness

Culbertson, comm ISS expedition 3, 11

(Frank, Testimony before congress, 18 May, ProQuest, JT)

There is one other aspect of spaceflight that was brought home to me in deep and sometimes very personal ways virtually every day I spent in orbit - and still now as I'm stuck on the ground. That is the effect of space exploration on the educational goals of our youth. Most of the people of this country - and of most other countries - especially the young people, see eventual access to space as part of their future, and maybe even as much a right as access to airlines and highways. It's not clear that many people have a realistic understanding of the challenges of maintaining and growing our presence in orbit, much less through the solar system, but the ultimate product of that interest is the benefit to our educational system, the motivation for students to excel in STEM subjects, and hopefully to help maintain our leadership in the world on many fronts. I know from speaking to schools around the globe, both from space, and on my feet, that the space program's influence on education is profound, but still not fully capitalized upon. As Administrator Bolden said, "Through the science, research, and technology demonstrations conducted on the National Lab [in space], we will build foundational knowledge, advance economic competitiveness, and prepare for the grand journeys ahead.

Space exploration leads to innovation and future science breakthroughs - inspiration

Aldridge 04 (E.C., Chair of the President’s Commission on Implementation of United States Space Exploration Policy, June, http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf 6/22/11) HD

Exploration. Exploring the Moon, Mars, and beyond is a great journey worthy of a great nation. The impulse to explore the unknown is a human imperative, and a notable part of what animates us as a people. This endeavor presents an opportunity to inspire a new generation of American explorers, scientists, entrepreneurs, and innovators who will provide positive American leadership to the world.

Competitiveness I/L: Minerals

Mars is abundant with minerals that are easy and cheap to mine

Red Colony No Date

(<http://www.redcolony.com/features.php?name=whycolonizemars>, accessed: 23 June 2011, JT)

Mars is worth a lot of money. There are 144 trillion square meters of surface area, roughly the land area of the Earth, available for development. I'm not going to tell you how great all that land is for residential, commercial, and industrial use... go play Sim City. An important part of the fusion reaction process is deuterium, a stable isotope of hydrogen. Once we can contain a fusion reaction, the deuterium-tritium reaction has a high yield of energy for the small amount of fuel put in. Deuterium, or heavy hydrogen, is hard to obtain on Earth, but on Mars it is five times more abundant in the form of Hydrogen-Deuterium-Oxygen (See Also: Compositions). A milliliter of liquid heavy-hydrogen fuel would produce as much energy as 20 tons of coal. Deuterium is also important in chemistry because it reacts the same way as hydrogen, but can be distinguished from hydrogen by its mass. These reactions occur slower than normal hydrogen reactions. There is an abundance of rare metals on Mars such as platinum, gold, silver, and others. Shipping from Mars to Earth, as mentioned above, is much easier than the other way around. Even more promising is the proximity of the asteroid belt to Mars. Dactyl, the moon orbiting the asteroid Ida shown in this picture, is 1.4 kilometers in diameter, yet it contains more iron that the human race has used in its entire existence. These asteroids could be mined near Mars and shipped from the planet for little cost. What we could see develop is a triangle trade route, much like the one in the 18th century between Britain, the West Indies, and America. The economic potential is colossal.

Access to rare earth minerals is key to U.S. competitiveness

Lamborn, rep from Colorado, 11

(Doug, Federal News Service, 24 May 2011, LexisNexis, JT)

Now I'll recognize myself for five minutes, and then the ranking member. We are here today to discuss the nation's strategic and critical minerals policy and opportunities for improvement so the United States can better meet domestic needs, create jobs and strengthen our economy and national security by decreasing our foreign dependence on mineral materials. Today, we will gain valuable insights from the mining industry, users of mineral commodities and American resources advocate and the chairman of two National Research Council reports published in 2008 and a 2011 report issued by the American Physical Society and the Materials Research Society. Rare earth elements are important components for renewable energy technologies, telecommunications, medical devices, and maybe most importantly, military technology. They are used to make very small and powerful magnets. In fact, if you'll allow me to demonstrate, I have two such magnets here in my hands today, neodymium, and these are very powerful and are difficult to pull apart. And you should be careful when you do so because you can squeeze your finger when they let loose. So this is an example of a very small but powerful magnet that is not found in normal magnetic minerals that we just use in everyday use. Magnets like these can be used in the military drones that have played an important part in the war on terrorism. The industrialization of China and India is driving demand for non-fuel mineral commodities, sparking a period of resource nationalism. Steps taken by China to restrict exports of mineral commodities needed for the industrialization of their country highlights the need for the United States to assess the state of our nation's mineral policies and the opportunities to produce these and other strategic and critical minerals domestically. According to the National Research Council, one of the primary advantages the United States possesses over our strongest industrial competitors is our domestic resource base. In other words, we have a lot of mineral resources that could be developed.

Competitiveness I/L: Aerospace Industry/Tech

Increased US spaceflight is key to competitiveness- maintains superiority in critical disciplines.

Hauser 2009 (Marty, VP of Washington operations, research and analysis, at the Space Foundation, *Federal News Service,* “HEARING OF THE SPACE AND AERONAUTICS SUBCOMMITTEE OF THE HOUSE SCIENCE AND TECHNOLOGY COMMITTEE; SUBJECT: "THE GROWTH OF GLOBAL SPACE CAPABILITIES: WHAT'S HAPPENING AND WHY IT MATTERS"”, 11/19/2009,Lexis, KF)

We are losing our competitive position in some of the most critical disciplines such as launch, manufacturing, and services. We must work harder to preserve and retain strategic technical and commercial advantages to remain the market leader in any global technology field. In some cases, international capabilities provide opportunities for us in terms of technology exchange, exports, outcomes through direct foreign investment. In other instances the international capabilities may be competitive in nature and may reduce U.S. capability and economic opportunity over long term. It can also create rivals and I doubt that any of us want to hear about a Soviet- Chinese relationship and cooperation that goes on without involving the United States. From a purely pragmatic point of view, space is crowded and we need to reduce the debris that is up there because the potential for satellite collisions is great. Historically, the United States has held a position of space superiority. This means we have a more favorable position than most other nations in space. However, this space superiority is sliding quickly towards parity. A few quick examples: the Russians lead the world in space launch over the past five years and they intend to increase that dramatically. While Russia and the United States provide the most orbital launches from year to year, 2007 and 2008, the share of non-U.S. Russian launches grew from 34 to 41 percent. I don't envy your task, but I agree with much of what you both said in your opening statements. So for me, this is my personal view because it comes down to one simple question. Does the United States want to continue to be the leader in space? If the answer is no then we our already living our future. If the answer is yes, however, we must remember that our leadership position in space is not a birth right. Over the past 50 years, we have had to make bold decisions and earn that leadership position. To continue being the global space leader we must bite the financial bullet, roll up our sleeves, and get to work. If we apply our great minds and our great talent, find better and smarter ways, we make the trade-offs to do what is necessary to get to and work in space, rebuild international partnerships and share costs where no one else can. We stand up and lead the way we always have. We innovate, we educate, we produce, and we lead. Space is an enabler for people around the world in a multitude of industries that can better our world. But to better our world we must first, as the United States, once again enable space. Thank you for your time. I'm prepared to answer your questions later.

Competitiveness Key to Heg

Competitiveness key to Heg

Dabney 10 a former bioscience communicator at the University of California, San Diego, is a freelance writer based in Chula Vista, Calif., specializing in science and education, 15 August 2010 (Michael, The Epoch Times, U.S. Competitive Edge in Jeopardy, In)

In his seminal 2002 best-seller "The Creative Class," author Richard Florida had a thing or two to say about America's diminishing leadership in innovation. He wrote: "TheUnited Stags appears to have thrown its gearshift into reverse At all levels of government and even in the private sector, Americans have been cutting back crucial investments in creativity—in education, in research, in arts and culture—while pouring billions into low-return or no-retum public projects like sports stadiums ... If these trends continue, me U.S. may well squander its once-considerable lead." It is America's declining hegemony in high-tech innovation and research that has got decision makers in the U.S.—from the Oval Office and the National Science Foundation in Washington to researchers, business leaders, and educators across the country— concerned. "For more than half a century, the United States has led the world in scientific discovery and innovation. It has been a beacon, drawing the best scientists to its educational institutions, industries and laboratories from around the globe," The Task Force on the Future of American Innovation wrote in the report "The Knowledge Economy: Is the United States Losing Its Competitive Edge?" "However, in today's rapidly evolving competitive world the United States can no longer take its supremacy for granted. Nations from Europe to Eastern Asia are on a fast track to pass the United States in scientific excellence and technological innovation," the report said. Indeed, there are warnings on the horizon. Here are just some of them: Fewer graduates in science and engineering: America's educational system was once at the forefront of producing the best scientists and engineers; but today, undergraduate science and engineering degrees in the United States are being awarded less frequendy than in other countries. For example, according to the Council on Competitiveness, the ratio of first university degrees in natural sciences and engineering to the college-age population in the United States is only 5.7 degrees per 100. Some European countries, including Spain, Ireland, Sweden, the United Kingdom, France, and Finland, award between S and 13 degrees per 100. Japan awards 8 per 100, and Taiwan and South Korea each award about 11 per 100. Stagnant growth: Although the US remains a competitive leader in innovation, it has made the least progress of all developing nation s in competiveness and innovation capacity over the last decade, according to a 2009 report by the Information Technology and Innovation Foundation titled "The Atlantic Century: Benchmarking EU & U.S. Innovation and Competitiveness." A fall from grace in key high-tech sectors From 199Sto 2003, the balance of trade in the manufacture of aircraft—which for years was one of the strongest U.S. export sectors—fell from S39 billion to S24 billion, a loss of SI 5 billion, reflecting increased sales of foreign-made commercial aircraft to U.S. carriers. In areas of information technology, biotechnology, nanotechnology, and fusion energy ^-ienre, the United States is also losing ground to Asia and some countries in the European Union fEU). '"Can America compete?' is the nation's new Xo. 1 anxiety, the topic of emotional debate," wrote Fortune magazine's Geoffrey Colvin. "We're not building human capital the way we used to. Our primary and secondary schools are falling behind the rest of the world's. Our universities are ;r:". excellent, but the foreign students who come to them are increasingly taking then-educations back home. As other nations multiply their science and engineering graduates— building the foundation for economic progress—ours are declining, in part because those fields are seen as nerdish and simply uncool." To be sure, experts are quick to point out that despite these challenges, no one is saying that Americans can't adapt and get back on track. The Task Force on the Future of American Innovation report stated: "The United States still leads the In world in research and discovery, but our advantage is rapidly eroding, and our global competitors may soon overtake us.” To remain competitive in the global arena, the task force said, theUnited States must redirect its attention to the factors that have driven American innovation for years: research (especially that which is funded through federal and private entities for scienceand engineering), education, the technical workforce, and economic growth. ColumbiaUniversity professor Dr. Jeffrey Sachs, cited in Colvin’s article, underscores this point. In acompetitive global market, he said, it is science and technological breakthroughs thatfundamentally influence economic development, and in an economy where technology leadershipdetermines the winners, education trumps everything. That’s a problem for America, Bill Gatestold Fortune magazine. He said while American fourth-graders are among the world’s best inmath and science, by ninth grade they’ve fallen way behind. "This isn’t an accident or a flaw inthe system; it is the system,” said Gates. That is why America’s decline in producing top-notchscientists and engineers is such a serious concern, experts say. While America lags, “low-costcountries—not just China and India but also Mexico, Malaysia, Brazil, and others—are turningout large numbers of well-educated young people fully qualified to work in an information-basedeconomy,” said Colvin. For example, he said, China in 2005 produced about 3.3 million collegegraduates, India 3.1 million (the majority of them English-speaking), and the United States just1.3 million. In engineering, China’s graduates numbered over 600,000, India’s 350,000 and theUnited States’ only about 70,000, making it highly probable that the United States may berequired to outsource its research and development overseas eventually if this trend is notaddressed. “Americans who thought outsourcing only threatened factory workers and call-center operators are about to learn otherwise,” Colvin warned. While many studies exploring thecompetitiveness of America in science and technology indicate that America still leads other countries in key areas of these fields, the 2009 report from the Information Technology andInnovation Foundation found cause for both the United States and the EU to be concerned in theface of increasing Asian competition. The report evaluated and rated global innovation-basedcompetitiveness in science and technology of 40 nations and regions (including the EU-10 andthe EU-15) as they currently stand, and in terms of the progress they have made over the lastdecade. In it, the United States was rated fourth place in global competitiveness among all   nations , and the EU 18th place. However, the study found that   the United States has made theleast progress of the 40 nations and regions   in improvement in international competitiveness and   innovation capacity over the last decade , while   China was rated first in this category. The EU-15 region was found to have made more improvements over the last decade than the UnitedStates but slower than the overall average and, as a result, was ranked 29th among the 40 nationsand regions. “If the EU-15 region as a whole continues to improve at this faster rate than theUnited States, it would surpass the United States in innovation-based competitiveness by 2020,”the report said. However, with the positive showing of Asian nations in the study, the report’sauthors Robert Atkinson and Scott Andes wrote, “To find global leaders [in high tech], Asia isthe place to look.” The study’s findings also have significant implications for Europe and theUnited States, the authors said. First, the rise of global economic competition means that theUnited States and Europe need to think of themselves as a big state or a big nation, and proactively put in place national or continental economic development strategies

Competitiveness Key to Heg

U.S. competitiveness is key to hegemony; a loss of our edge will cause isolationism

Khalilzad, Rand Corporation 95 – (Zalmay, “Losing the Moment?” The Washington Quarterly, Vol. 18, No. 2, pg. 84, Spring, Lexis)

The United States is unlikely to preserve its military and technological dominance if the U.S. economy declines seriously. In such an environment, the domestic economic and political base for global leadership would diminish and the United States would probably incrementally withdraw from the world, become inward-looking, and abandon more and more of its external interests. As the United States weakened, others would try to fill the Vacuum. To sustain and improve its economic strength, the United States must maintain its technological lead in the economic realm. Its success will depend on the choices it makes. In the past, developments such as the agricultural and industrial revolutions produced fundamental changes positively affecting the relative position of those who were able to take advantage of them and negatively affecting those who did not. Some argue that the world may be at the beginning of another such transformation, which will shift the sources of wealth and the relative position of classes and nations. If the United States fails to recognize the change and adapt its institutions, its relative position will necessarily worsen. To remain the preponderant world power, U.S. economic strength must be enhanced by further improvements in productivity, thus increasing real per capita income; by strengthening education and training; and by generating and using superior science and technology. In the long run the economic future of the United States will also be affected by two other factors. One is the imbalance between government revenues and government expenditure. As a society the United States has to decide what part of the GNP it wishes the government to control and adjust expenditures and taxation accordingly. The second, which is even more important to U.S. economic wall-being over the long run, may be the overall rate of investment. Although their government cannot endow Americans with a Japanese-style propensity to save, it can use tax policy to raise the savings rate.

Science Key to Soft Power/Diplomacy

U.S. scientific strength key to soft power and diplomacy- solves war and boosts the economy.

Fedoroff, Science and Technology Adviser to the Secretary of State, 8

(Nina, Testimony Before the House Science Subcommittee on Research and Science Education , http://gop.science.house.gov/Media/Hearings/research08/April2/fedoroff.pdf, 4-2, pgs. 1-3, SRF)

 Chairman Baird, Ranking Member Ehlers, and distinguished members of the Subcommittee, thank you for this opportunity to discuss science diplomacy at the U.S. Department of State. The U.S. is recognized globally for its leadership in science and technology. Our scientific strength is both a tool of “soft power” – part of our strategic diplomatic arsenal – and a basis for creating partnerships with countries as they move beyond basic economic and social development. Science diplomacy is a central element of the Secretary’s transformational diplomacy initiative, because science and technology are essential to achieving stability and strengthening failed and fragile states. S&T advances have immediate and enormous influence on national and global economies, and thus on the international relations between societies. Nation states, nongovernmental organizations, and multinational corporations are largely shaped by their expertise in and access to intellectual and physical capital in science, technology, and engineering. Even as S&T advances of our modern era provide opportunities for economic prosperity, some also challenge the relative position of countries in the world order, and influence our social institutions and principles. America must remain at the forefront of this new world by maintaining its technological edge, and leading the way internationally through science diplomacy and engagement. Science by its nature facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities for all. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all. Science is also a common global language, able to bridge deep political and religious divides. Scientists share a common language. Scientific interactions serve to keep open lines of communication and cultural understanding. As scientists everywhere have a common evidentiary external reference system, members of ideologically divergent societies can use the common language of science to cooperatively address both domestic and the increasingly transnational and global problems confronting humanity in the 21 st century. There is a growing recognition that science and technology will increasingly drive the successful economies of the 21 st century. Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board’s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born. Finally, some types of science – particularly those that address the grand challenges in science and technology – are inherently international in scope and collaborative by necessity. The ITER Project, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor will harness the power of nuclear fusion as a possible Testimony of Dr. Nina Fedoroff Page 3 new and viable energy source by bringing a star to earth. ITER serves as a symbol of international scientific cooperation among key scientific leaders in the developed and developing world – Japan, Korea, China, E.U., India, Russia, and United States – representing 70% of the world’s current population.. The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. The elimination of the promised U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures. More problematically, it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the United States used science diplomacy as a means to maintain communications and avoid misunderstanding between the world’s two nuclear powers – the Soviet Union and the United States. In a complex multi-polar world, relations are more challenging, the threats perhaps greater, and the need for engagement more paramount.

Science Diplomacy key to Non-Prolif

U.S. Science diplomacy is the only way to scale down nuclear weapons and prevent proliferation-solves nuclear war

Dickson, director for Scidev.net, 10

(David, SciDev Net, 5-7, <http://www.scidev.net/en/editorials/nuclear-disarmament-is-top-priority-for-science-diplomacy.html>, 6-22-11, SRF)

The political climate is ripe for a new push to eliminate nuclear weapons; scientists can boost its chance of success. Earlier this year, US satellites detected the first plume of steam from a nuclear reactor in Pakistan that has been built to produce fuel for nuclear bombs, confirming the country's desire to strengthen its status as a nuclear power. The observation — coming shortly before this month's review conference in New York of the Nuclear Non-Proliferation Treaty (NPT) — is further evidence that the unregulated spread of nuclear technology remains closely linked to the dangers of nuclear conflict. The good news is that US President Barack Obama seems determined to make eliminating nuclear weapons a top priority. Indeed, last month he invited 47 heads of state to an unprecedented summit in Washington to promote disarmament and agree strategies to prevent nuclear terrorism and safeguard nuclear material. But the news from Pakistan, together with continued disagreement on how best to tackle other emerging nuclear states such as Iran and North Korea, illustrates how far there is to go — and the political hurdles that must still be scaled — before this goal is achieved. New hope Still, there is a sense of optimism for this year's review conference that was missing from the last meeting in 2005. Then, the aggressive stance taken by the Bush administration — describing North Korea as part of an "axis of evil", for example — doomed the discussions to stalemate. This time round, the prospects for agreement are significantly higher. Not only has Obama adopted a more moderate attitude towards international affairs in general, but he has already made significant achievements on the nuclear front. Last month, for example, Russia and the United States announced an arms control agreement under which both will significantly reduce their nuclear arsenals. And since then, Obama has revised his nuclear policy to state, for the first time, that non-nuclear states that have signed the NPT will never be targets of US nuclear weapons. Both agreements could have gone further. Some in Obama's administration wanted him to take the further step of banning the use of nuclear weapons against any non-nuclear threat or attack. And despite the new cuts, both Russia and the United States will still own enough nuclear weapons to destroy human life many times over. But the recent moves have nonetheless created a political climate in which significant agreement, at least between nuclear weapons states, looks more realistic than it did five years ago. There are even signs that the United States could eventually ratify the Comprehensive Nuclear Test Ban Treaty, the next major step towards global nuclear disarmament. Need for vigilance The reasons for optimism are not restricted to the shift in the US position. Equally influential has been a growing awareness within the developed and developing worlds of the threats of nuclear terrorism and the need to improve protection of nuclear materials. Eighteen months ago, for example, an armed group was caught breaking into a nuclear facility in South Africa in an apparent attempt to steal weapons-grade uranium that has been stored at the site since the early 1990s, under international supervision. The incident provides a stark reminder of the need for continued and effective vigilance. This need will increase as more developing countries turn towards nuclear power as a source of affordable energy — a trend that will be reinforced by international efforts to promote renewable energy as a strategy for tackling climate change. But the danger is that US-led initiatives will, with some justification, be seen as little more than attempts to defend American interests, influenced as much by political relationships as by a genuine desire for nuclear disarmament. For example, the nuclear cooperation deal between the United States and India that entered force in 2008 has been cited by the Carnegie Endowment for International Peace as an example of putting diplomatic and commercial interests ahead of non-proliferation responsibilities and was criticised for exacerbating nuclear tensions in South Asia. Scientists, diplomats or both? The only solution is for the developing world to accept that international nuclear non-proliferation is in its own interests — the only way to prevent regional conflicts escalating into nuclear exchanges. The scientific community has an important role to play in this process by explaining the threat posed by even relatively small nuclear weapons, and advising on how to develop safeguards without overly restricting the peaceful uses of nuclear energy. Scientists have already shown their worth when they kept communication channels open between the United States and the Soviet Union during the Cold War. The Pugwash Conferences on Science and World Affairs were instrumental to such 'science diplomacy' and it can be no coincidence that the approach is rapidly gaining favour in Washington, where John Holdren, who once headed Pugwash, is Obama's science and technology advisor. If such diplomacy, on the control of nuclear weapons or other scientific issues, is driven by the political and commercial interests of the developed world, it will remain suspect and doomed to fail. But if it can be truly international, the chances of success are much higher. Reaching a global agreement on the steps needed to eliminate nuclear weapons from the world would be a good place to start.

A2: Krugman

Krugman is in denial- countries do compete and the US is losing the game

Ezell 11 (Steven, Senior Analyst with the Information Technology and Innovation Foundation , January 25, http://www.innovationpolicy.org/krugman-dead-wrong-that-competitiveness-is-a, 7/3/11) HD

In a Sunday op-ed in the New York Times, "The Competition Myth,” Paul Krugman argues that “competitiveness” is a myth, a bad metaphor, a fundamentally misleading goal, and that it doesn’t make “any sense to view our current woes as stemming from a lack of competitiveness.” About this, Krugman is absolutely, dead-on, 100 percent wrong. For the reality is that the perilous state of the American economy has everything to do with faltering U.S. competitiveness—and more than that—much to do with the abject refusal of neoclassical economists like Krugman himself to recognize that competitiveness is an issue, that countries compete, and that U.S. economic policy should be directly designed to bolster the competitiveness of U.S. organizations and industries. Krugman’s like the young boy who finds himself losing a race with his buddies and who stops and yells, “I’m not racing!” Better to simply pretend that you aren’t racing than to lose. For if you can convince yourself that you aren’t in a race, you sure sleep better at night than if you admitted you were in a competition and were losing…That is, until you wake up one morning having lost ten million manufacturing jobs, have 10% unemployment, and have a horrifically bad trade balance. Moreover, when you refuse to even believe that you’re in a race, it’s a sure sign that you’re going to lose, as evidenced by the fact that the United States ranks 40th of out of 40 countries and regions in improving its innovation competitiveness over the past decade, as ITIF’s Atlantic Century report found. Krugman’s misguided perspective on competitiveness dates back to a 1994 Foreign Affairs article he wrote, “Competitiveness, A Dangerous Obsession,” in which he made the utterly astounding contention that, “The notion that nations compete is incorrect…countries are not to any important degree in competition with each other.” Like many U.S. elites, Krugman simply refuses to recognize that the U.S. is in global economic—and innovation—competition with other nations. This view remains readily apparent in the NYT article, where Krugman contends that “we’re in a mess because we had a financial crisis, not because American companies have lost their ability to compete with foreign rivals.” Krugman goes on, “But isn’t it at least somewhat useful to think of our nation as if it were America Inc., competing in the global marketplace? No.” So again, only companies compete with one another; and it’s not helpful to think of the U.S. as competing. Moreover, our companies are competing fine…so the problem must be a financial crisis (caused by a few malfeasant firms in the financial sector).

A2: Krugman

Krugman is wrong- competition between governments is critical

Ezell 11 (Steven, Senior Analyst with the Information Technology and Innovation Foundation, January 25, http://www.innovationpolicy.org/krugman-dead-wrong-that-competitiveness-is-a, 7/3/11) HD

First, an increasingly globalized economy means that countries have become price takers—not price makers—on international markets. In other words, companies now shop the world for the best locations to situate their globally mobile innovation activity, such as where to locate R&D facilities or build new factories. These companies look for which countries offer the best pools of talent (skilled scientists and engineers and a highly educated, highly skilled populace); which have the most attractive tax laws in terms of low corporate tax rates and generous and stable R&D tax credits; which have the most robust physical and digital infrastructures, the latter especially in terms of fixed and mobile broadband, electric smart grids, or intelligent transportation systems; which have the best high-skill immigration policies; the deepest pools of capital; the best funding for R&D; the easiest place to start a business; etc.. Collectively, these attributes constitute a nation’s innovation ecosystem, and governments play a legitimate and crucial role in shaping their nation's innovation ecosystem. In fact, it is these innovation ecosystems on which countries increasingly compete. As Greg Tassey, a Senior Economist at the Department of Commerce National Institute of Standards and Technology argues, “Competition among governments has become a critical factor in determining which economies win and which lose in the increasingly intense process of creative destruction.” But Krugman refuses to see this because “only companies compete.” This raises a consequent challenge again explained by Tassey: “Another underlying problem is that U.S. firms are attempting to compete largely as independent entities against a growing number of national economies in Europe and Asia in which government, industry, and a broad infrastructure (technical, education, economic, and information) are evolving into increasingly effective technology-based ecosystems.” Or as Wayne Johnson, Hewlett Packard’s Director of Worldwide Strategic University Customer Relations, said at a 2008 conference, “We in the United States find ourselves in competition not only with individuals, companies, and private institutions, but also with governments and mixed government-private collaborations.” In other words, the United States has a collection of players (businesses) running around competing against other players (nations) that are well equipped, well coached, and running specific plays.

\*\*Neg\*\*

AT: Space Dominance/Competitiveness

International Coop, not competition is key to soft power in space

Johnson-Freese 07 (Joan, Department Chair of National Security Studies at Naval War College, Space as a Strategic Asset, p.248) HD

In the 1960s, leadership was the motivation that took the United States to the moon, as the country wanted to show itself as the winner in a technology-based competition against the Soviet Union. It was a techno-nationalist show of prowess. Today, post–September 11 and equally or more important, with the ongoing war in Iraq, the United States needs to again recognize and embrace the leadership opportunity offered by manned space exploration but this time based on cooperation, not competition. Leading an international inclusive expedition from earth allows the United States to counter its unilateralist militarist image, which has prevailed due to both the Iraq war and U.S. moves toward space weaponization. Such a choice would go a long way toward rebuilding American soft power by positively leading the world on a global endeavor to step into space together for exploration development and applications useful on earth. It is the ultimate positive “big event” strategic communication message of leadership. From the global participants’ side, taking part in a grand space program does more than just help countries construct technology and create industries; it builds dreams and generatespride. Working cooperatively with other countries on a space venture would also alleviate fears about U.S. intentions to monopolize space.

Heg Defense- Low Now

Heg decline now- shift of power to China, India, Brazil, and Turkey

Rachman 11 (Gideon, columnist on foreign affairs, January/February, http://www.foreignpolicy.com/articles/2011/01/02/think\_again\_american\_decline?sms\_ss=blogger&at\_xt=4d2732d48e4effd8%2C0 7/3/11) HD

The Chinese challenge to the United States is more serious for both economic and demographic reasons. The Soviet Union collapsed because its economic system was highly inefficient, a fatal flaw that was disguised for a long time because the USSR never attempted to compete on world markets. China, by contrast, has proved its economic prowess on the global stage. Its economy has been growing at 9 to 10 percent a year, on average, for roughly three decades. It is now the world's leading exporter and its biggest manufacturer, and it is sitting on more than $2.5 trillion of foreign reserves. Chinese goods compete all over the world. This is no Soviet-style economic basket case. Japan, of course, also experienced many years of rapid economic growth and is still an export powerhouse. But it was never a plausible candidate to be No. 1. The Japanese population is less than half that of the United States, which means that the average Japanese person would have to be more than twice as rich as the average American before Japan's economy surpassed America's. That was never going to happen. By contrast, China's population is more than four times that of the United States. The famous projection by Goldman Sachs that China's economy will be bigger than that of the United States by 2027 was made before the 2008 economic crash. At the current pace, China could be No. 1 well before then. China's economic prowess is already allowing Beijing to challenge American influence all over the world. The Chinese are the preferred partners of many African governments and the biggest trading partner of other emerging powers, such as Brazil and South Africa. China is also stepping in to buy the bonds of financially strapped members of the eurozone, such as Greece and Portugal. And China is only the largest part of a bigger story about the rise of new economic and political players. America's traditional allies in Europe -- Britain, France, Italy, even Germany -- are slipping down the economic ranks. New powers are on the rise: India, Brazil, Turkey. They each have their own foreign-policy preferences, which collectively constrain America's ability to shape the world. Think of how India and Brazil sided with China at the global climate-change talks. Or the votes by Turkey and Brazil against America at the United Nations on sanctions against Iran. That is just a taste of things to come.

A2: Competitiveness- Krugman

Competitiveness is only true for competing industries, not countries

Krugman 11 (Paul, Nobel Prize winner for economics, Professor of Economics and International Affairs at Princeton University January 22, http://krugman.blogs.nytimes.com/2011/01/22/competitiveness/ 7/3/11) HD

Sigh. So it appears that President Obama is going to make “competitiveness” his main economic theme. To be fair, he could (and may well) do worse. But this is hackneyed stuff, and involves a fundamental misconception about the nature of our economic problems. It’s OK to talk about competitiveness when you’re specifically asking whether a country’s exports and import-competing industries have low enough costs to sell stuff in competition with rivals in other countries; measures of relative costs and prices are, in fact, commonly — and unobjectionably — referred to as competitiveness indicators. But the idea that broader economic performance is about being better than other countries at something or other — that a companycountry is like a corporation –is just wrong. I wrote about this at length a long time ago, and everything I said then still holds true.\* The hopeful interpretation of Obama’s embrace of the idea that he’s the CEO of America Inc. is that it might help fend off right-wing attacks on government action as a whole, helping him sell the need for public investment of various kinds. On the other hand, as Robert Reich says, this could all too easily turn into a validation of the claim that what’s good for corporations is good for America, which is even less true now than it used to be. All in all, it’s kind of sad. And the less said about Jeffrey Immelt’s vacuous op-ed, the better.

Obama’s rhetoric on competitiveness is just packaging to boost his credibility and put a good face on a bad economy

Krugman 11 (Paul, Nobel Prize winner for economics, Professor of Economics and International Affairs at Princeton University January 24, http://economistsview.typepad.com/

economistsview/2011/01/paul-krugman-the-competition-myth.html 7/3/11) HD

This may be smart politics. Arguably, Mr. Obama has enlisted an old cliché on behalf of a good cause, as a way to sell a much-needed increase in public investment... But ... talking about “competitiveness” as a goal is fundamentally misleading. At best, it’s a misdiagnosis of our problems. At worst, it could lead to policies based on the false idea that what’s good for corporations is good for America. About that misdiagnosis: What sense does it make to view our current woes as stemming from lack of competitiveness? It’s true that we’d have more jobs if we exported more and imported less. But ... ultimately, we’re in a mess because we had a financial crisis, not because American companies have lost their ability to compete... But isn’t it at least somewhat useful to think of our nation as if it were America Inc., competing in the global marketplace? No. Consider: A corporate leader who increases profits by slashing his work force is considered successful. Well, that’s more or less what has happened in America recently: employment is way down, but profits are hitting new records. Who, exactly, considers this economic success? Still, you might say that talk of competitiveness helps Mr. Obama quiet claims that he’s anti-business. That’s fine, as long as he realizes that the interests of nominally “American” corporations and the interests of the nation, which were never the same, are now less aligned than ever before. ... So what does the administration’s embrace of the rhetoric of competitiveness mean for economic policy? The favorable interpretation, as I said, is that it’s just packaging for an economic strategy centered on public investment, investment that’s actually about creating jobs now while promoting longer-term growth. The unfavorable interpretation is that Mr. Obama and his advisers really believe that the economy is ailing because they’ve been too tough on business, and that what America needs now is corporate tax cuts and across-the-board deregulation. My guess is that we’re mainly talking about packaging here. ... But even if he proposes good policies, the fact that Mr. Obama feels the need to wrap these policies in bad metaphors is a sad commentary on the state of our discourse. The financial crisis of 2008 was a teachable moment, an object lesson in what can go wrong if you trust a market economy to regulate itself. ... For whatever reason, however, the teachable moment came and went with nothing learned. Mr. Obama himself may do all right: his approval rating is up, the economy is showing signs of life, and his chances of re-election look pretty good. But the ideology that brought economic disaster in 2008 is back on top — and seems likely to stay there until it brings disaster again.

Competitiveness- Alt Caus

Alt causes-

A. Failing education and lack of skilled immigrants

Bartlett ‘6 [David,, President of Global Economics “Building a competitive workforce: Immigration and the US Manufacturing sector?” August 8, 2006 [<http://www.businessweek.com/magazine/content/08_38/b4100052741280.htm>]

Shortages of skilled labor constitute the foremost challenge confronting U.S. manufacturers who face growing competition from manufacturers in Asia, Eastern Europe, and elsewhere. Demand for professionals with university degrees is rising as manufacturing becomes increasingly high tech. But the U.S. educational system is not producing enough highly educated native-born manufacturing workers to meet this growing demand. Moreover, the pending retirements of Baby Boom generation workers will further constrain the growth of the manufacturing labor force. Bridging this gap between the supply and demand for skilled workers requires new investments in the U.S. educational system and the formulation of immigration policies that respond to the labor needs of the U.S. economy. Yet current immigration policies, especially since 9/11, have made it more difficult for highly skilled professionals from abroad to enter the United States.

B. Reverse brain drain

Bartlett ‘6 [David, President of Global Economics “Building a competitive workforce: Immigration and the US Manufacturing sector?” August 8, 2006 [<http://www.businessweek.com/magazine/content/08_38/b4100052741280.htm>]

In addition to the advanced industrialized countries, developing/emerging economies have become important rivals of the United States in the global war for talent. In FY 2003, India and China accounted for 45.7 percent of H1-B visas issued by the United States, well surpassing the shares of Canada (5.1 percent), the United Kingdom (3.5 percent), Japan (2.6 percent), Germany (1.6 percent), and France (1.5 percent). [[33]](http://www.ilw.com/articles/2006%2C0823-bartlett.shtm#_33#_33) These two emerging market giants also represented the dominant share (34.7 percent) of new employment-based LPRs in the United States in FY 2004 {Figure 8}. [[34]](http://www.ilw.com/articles/2006%2C0823-bartlett.shtm#_34#_34) These figures testify to (1) India and China's growing prominence as sources of scientists and engineers in the United States, and (2) the allure of the United States as a destination for talented professionals from those countries. Nevertheless, the danger facing the United States is "reverse brain drain," whereby young people from India, China, and other emerging markets acquire cutting edge skills in American universities and corporations and then return home. Any decrease in the supply of skilled foreign workers exacts a severe penalty on U.S. manufacturers who face growing competition from lower-cost manufacturers in Asia, Eastern Europe, and other emerging markets. Many of these same emerging market rivals of the United States are reaping the competitive advantages that come with the global diffusion of process technologies and operational best practices. Therefore, the prospect of reverse brain drain is particularly daunting for American manufacturers.

C. Economic factors and baby boom retirement

Bartlett ‘6 [ David,, President of Global Economics “Building a competitive workforce: Immigration and the US Manufacturing sector?” August 8, 2006 [<http://www.businessweek.com/magazine/content/08_38/b4100052741280.htm>]

At the same time, demographic and economic factors are constraining the supply of native-born manufacturing employees possessing these skills. Retirements of Baby Boom generation workers-a trend already underway and expected to peak in 2012-are depleting the ranks of experienced equipment operators in the U.S. manufacturing sector. The science and engineering (S&E) labor force is also declining: 26 percent of S&E workers in the United States are over 50, and growing numbers of these individuals will retire in the next two decades. [[5]](http://www.ilw.com/articles/2006%2C0823-bartlett.shtm#_5#_5)

Competitiveness- Alt Caus

Competitiveness will inevitably fall without a change to the education system.

Joris Evers. April 17, 2007. (Staff writer, CNET News. “Experts: Education key to U.S. Competitiveness.” <http://news.cnet.com/Experts-Education-key-to-U.S.-competitiveness/2100-1022_3-6176967.html>)

CUPERTINO, Calif.--Innovation and U.S. competitiveness will suffer if kids don't get a better education, a panel of experts said Tuesday. In particular, science, technology, engineering and math education in kindergarten through 12th grade needs a boost, according to panelists speaking at an event here that's part of a National Governors Association initiative. K-through-12 education has traditionally been a focus of governors because much of a state's budget is spent there. "In technology and engineering we're really doing nothing. In math and science we're basically teaching the same things we taught when I was in school and we're teaching it the same way," said Arizona Gov. Janet Napolitano, a Democrat who turns 50 this year. As current chair of the National Governors Association, Napolitano established the "[Innovation America](http://www.nga.org/portal/site/nga/menuitem.751b186f65e10b568a278110501010a0/?vgnextoid=e34e2bad2b6dd010VgnVCM1000001a01010aRCRD&vgnextchannel=92ebc7df618a2010VgnVCM1000001a01010aRCRD)" initiative. The goal is to come up with a list of policies and strategies governors across the U.S. can use to enhance the innovative capacity of their states and their ability to compete in this global economy, she said. Calling for improvements to U.S. education isn't new. Others, including Microsoft co-founder Bill Gates, have made [similar pleas to help the U.S. stay competitive](http://news.cnet.com/Gates-calls-for-infinite-H-1Bs%2C-better-schools/2100-1014_3-6165166.html). The Innovation America effort goes beyond lower education. It also aims to establish links with higher education and suggests incentives for entrepreneurship, such as tax credits for early investors and businesses that do research with universities, Napolitano said. "What is going to keep us competitive and what is going to help us in-source jobs? That is the investment in human capital and that is the investment in innovation," Napolitano said. The focus from governors is needed as [countries including China and India](http://news.cnet.com/Chinas-future--a-stroll-in-a-tech-park/2100-1022_3-6091265.html) increase their roles in the global marketplace. "The world is shrinking and now we're really competing for people all across the world," said Sean Walsh, special adviser to California Gov. Arnold Schwarzenegger, a Republican. California has attracted smart people from across the globe, but that actually points to shortcomings in the U.S. education system, Walsh said. "We are attracting the best and the brightest from all around the world, but that's making up for the fact that we're not necessarily producing some of the best and the brightest because our education is not up to snuff," he said.

Loss of competitiveness is inevitable-workers will leave to go to emerging markets.

David Bartlett. August 23, 2008. (President of the Global Economics Company. Immigration Daily. “Building A Competitive Workforce: Immigration And The US Manufacturing Sector.” http://www.ilw.com/articles/2006,0823-bartlett.shtm)

Any decrease in the supply of skilled foreign workers exacts a severe penalty on U.S. manufacturers who face growing competition from lower-cost manufacturers in Asia, Eastern Europe, and other emerging markets. Many of these same emerging market rivals of the United States are reaping the competitive advantages that come with the global diffusion of process technologies and operational best practices. Therefore, the prospect of reverse brain drain is particularly daunting for American manufacturers. In addition, many U.S. manufacturers do not have the option of offshoring their operations. As a result of the IT revolution, which has permitted the rapid and secure transmission of large information blocs across national borders, a growing share of back office business functions (finance, customer service, human resources) and professional services (legal, accounting, consulting, medical diagnostics) can be performed remotely. [[37]](http://www.ilw.com/articles/2006%2C0823-bartlett.shtm#_37) Some large OEMs have outsourced wide swaths of their manufacturing operations to contract manufacturers (a phenomenon especially visible in consumer electronics), while others have become global supply chain integrators more than manufacturers (e.g., Dell). These economic and technological changes have lowered the threshold for global operations, enabling some small- and mid-sized U.S. manufacturers to undertake foreign activities previously reserved for multinational-sized companies. But for most small/medium U.S. manufacturers-which are major sources of job creation and which fill market niches that are too small to be interesting to global OEMs-manufacturing remains a local activity requiring a skilled local labor force. Facing global rivals possessing unassailable cost advantages, U.S. manufacturers must attract employees with advanced training in science and engineering to meet the technical demands of modern manufacturing. Foreign-born professionals constitute a crucial part of the S&E workforce, underscoring the inextricable links between U.S. immigration policy and American manufacturing competitiveness.

Competitiveness- Alt Caus

Nothing can save declining US competitiveness – failed $5 trillion dollar investment proves

Mandel ‘8 [ Michael, Holds a Ph.D. in economics from Harvard University, [chief economist](http://en.wikipedia.org/wiki/Chief_economist) of the economic magazine [Business Week](http://en.wikipedia.org/wiki/Business_Week). “Can America Invent Its Way Back?” September 11, 2008 [<http://www.businessweek.com/magazine/content/08_38/b4100052741280.htm>]

But here's the conundrum: If money alone were enough to guarantee successful [innovation](http://bx.businessweek.com/innovation-economics/), the U.S. would be in much better shape than it is today. Since 2000, the nation's public and private sectors have poured almost $5 trillion into research and development and higher education, the key contributors to innovation. Nevertheless, employment in most technologically advanced industries has stagnated or even fallen. The number of domestic jobs in the computer and electronics sector continues to plunge while pharmaceutical and biotech companies lay off as many workers as they hire. And even the industry category that includes Google ([GOOG](http://investing.businessweek.com/research/stocks/snapshot/snapshot.asp?symbol=GOOG))—Internet publishing and Web search portals—has added only 15,000 jobs since 2003.