



## Remarks by

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To

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On The

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I'd like to begin by thanking Ranking Member Gordon and Representative Costello for inviting me and the IEEE-USA to participate in this roundtable discussion on America's science and technology workforce — a critically important national resource that faces increasing pressures and opportunities because of globalization. How America handles the challenge confronting its science and engineering workforce will have a major impact on the future technological competitiveness of the United States as well as its economic and national security.

My name is Ron Hira and I am an Assistant Professor of Public Policy at Rochester Institute of Technology. I am co-author of a new book, *Outsourcing America*, which examines many related issues in more detail. I am presenting my remarks today on behalf of the Institute of Electrical and Electronics Engineers – United States of America (IEEE-USA) where I am the Vice President for Career Activities, having previously served as Chair of the R&D Policy Committee and the Career and Workforce Policy Committee.

The Institute of Electrical and Electronics Engineers (IEEE) is a transnational technical and professional society made up of more than 380,000 individual members in 150 countries. The IEEE's primary purposes are to advance the theory and practice of electrical, electronics, computer and software engineering, improve the careers of its members and increase their ability to innovate and create wealth for the benefit of the societies in which they live and work.

IEEE-USA was established in 1973 to promote the professional careers and technology policy interests of IEEE's 225,000 US members.

Seventy percent of IEEE-USA's members work for private businesses, primarily in the aerospace and defense, biomedical technology, computers and communications, electrical and electronics equipment manufacturing and electric power industries. Thirty percent of our industry members work for firms with 500 or fewer employees. Ten percent of our members work for Federal, state and local governments. Another ten percent teach at American schools of engineering or work at non-profit research organizations. The remaining ten percent are self-employed and work as consultants to businesses and government.

### **Offshore Outsourcing And Offshoring Of Technology Jobs Is Having A Significant Impact On The US Workforce**

No one nor any organization has reliable figures on exactly how many information technology and engineering jobs have moved offshore in recent years. But even without definitive statistics, the negative impact of offshore outsourcing on high technology labor markets in the United States are observable. The resulting job displacements and depressed wages are also discouraging young people from studying these disciplines and choosing careers in science, engineering and technology.

US electrical and electronics engineers and computer scientists have experienced higher levels of unemployment in the past four years than any similar time-span since IEEE-USA was first established in 1973. And in 2003, for the first time, the unemployment rate for electrical and electronics engineers (6.2%) exceeded the national unemployment rate (5.6%). There are many reasons for the unusually high levels of unemployment among our nation's innovators, including the dot-com and telecom busts and a much broader economic downturn. There can be little doubt, however, that the transfer of high-wage jobs from the United States to lower cost overseas locations is a significant and growing cause of low demand for US engineers and computer scientists. While hiring has picked up in 2004 and 2005 job growth has not been robust enough to offset the losses in previous years.

Engineers whose jobs are offshored during a poor labor market face considerable burdens. Because they are likely to be unemployed for extended periods of time, they are deprived of significant opportunities to gain the hands-on experience needed to keep up with constantly changing technologies. If it's true that "the half-life of an engineer is three to five years," engineers who are out of work for a year or more risk losing cutting-edge skills much more rapidly than displaced workers in other occupations.

The poor labor market for electrical and electronics engineers and computer scientists is also causing wage depression. For the first time in the 31 years that IEEE-USA has been surveying its members median compensation actually declined in 2003.

Weak labor markets are also causing young people to shy away from technology disciplines, such as computer science, in significant numbers. The Computing Research Association recently reported a nationwide drop of more than 30% in BS degree enrollments in computer science

education programs between 2002 and 2004. Even at top schools like MIT, electrical engineering and computer science enrollments fell by 33% during the same two year period.

Students are responding rationally to what they perceive to be diminished long-term prospects in these fields. While Microsoft Chairman, Bill Gates has publicly decried declining enrollments in computer science, the reality is that his company only expanded its US workforce by 500 employees - 1.4% of its U.S. workforce - between 2003 and 2004. This pales in comparison to hiring by rapidly expanding offshore outsourcers like Infosys. Infosys, which hires very few Americans, increased its workforce by 11,000 over the same period.

An offshoring study issued last week by the management consulting firm, McKinsey & Co., concludes that the effect of offshoring on the US workforce will be small and that concerns about its impacts are “overblown.” These findings are surprising because they are at odds with a 2003 McKinsey study on offshoring which concluded that, while the US economy as a whole would benefit from offshoring, the US workforce would experience major losses in employment and wages.

It is important to note that McKinsey has a vested interest in the outcome of offshoring policy discussions. It advises clients on how to offshore and NASSCOM, the Indian IT industry association, is one of its clients. The McKinsey study, which is a forecasting exercise, is difficult to inspect by outside observers because it relies on proprietary data. The fact that so much attention goes to a study which cannot be fully scrutinized point to an important void in our understanding offshoring and its impacts: the lack of objective data. The policy discussion should be led by objective data not by studies conducted by management consulting firms.

The negative developments associated with outsourcing are alarming, but they should not be surprising because they match what we would expect to find when high-skill jobs are transferred to overseas locations.

### **The Employment Effects of Offshore Outsourcing Are Alarming But Not Surprising**

Most economists believe that offshoring has little or no long-term impact on the overall number of jobs and unemployment rates in the United States. They use a full employment model and assume that the US labor markets clear eventually as displaced workers find new jobs.

Many of these same economists agree, however, that in the short term offshoring causes: 1) job displacement for US workers; 2) a change in the mix of US occupations; and, 3) downward wage pressures on US jobs that are newly tradable across borders.

There is little disagreement that some US workers will lose their jobs as their work shifts to overseas locations. Just yesterday, for example, the Wachovia Corporation announced plans to move information technology jobs to India and told many of its US workers to prepare for layoffs. Based on the full employment theory, economists expect that most of these about-to-be displaced workers will be reemployed rapidly and at substantially the same wages. The reality is that this so-called ‘adjustment’ process has not been happening rapidly, if at all, for thousands of displaced technology workers. The reason appears to be the unusually low levels of cumulative job creation in the economy over the past few years. Many have called the on-going recovery from the 2001 recession, a job-less one. Unfortunately, there are few good explanations for why the recovery has not generated the number of jobs we would expect. Some have said that it is due

to productivity increases, but that explanation, which is tautological, is of little comfort to displaced workers.

The latest Bureau of Labor Statistics' Displaced Worker Survey, released in January 2004, provides some insight into reemployment rates for workers. For workers who were displaced between 2001-2003, it shows that 35% were still unemployed in January 2004, and of the 65% who were employed, only 43% earned as much as they had before displacement. So, the empirical data do not support the economists' hope that displaced workers will be reemployed rapidly (one-in-three remain unemployed) and at the same or higher wages (three-in-five took pay cuts).

These results are consistent with longer term results from displaced worker surveys conducted since 1979. Significant numbers of displaced workers are likely to remain unemployed for extended periods and many of those who find work take substantial pay cuts.

The second employment effect that economists predict is that offshoring will result in a change in the mix of US occupations as some jobs migrate to more efficient (lower cost labor) overseas locations. As the US loses engineering and other high skill jobs to more low-cost countries, Americans will simply move into other occupations, or so the theory suggests. There is no guarantee, however, that the new mix of US occupations will be better after offshoring.

To add to the uncertainty, economists can't predict what types of new jobs will be created. Even Federal Reserve Chairman Alan Greenspan gives vague answers about the jobs of the future, saying only that they will require higher skills. If we relinquish our engineering and computer programming jobs, will we be able to replace them with better jobs? This is a key policy question that no one can answer.

This is also a very practical question that I get asked at every IEEE meeting I attend. Invariably, someone asks, "What new jobs should I be training for? What new skill sets will I need?" I don't have answers for these kinds of questions and have yet to find anyone else who does.

Educators are grappling with the same questions. Engineering faculty want to adjust their curricula to make their students careers more immune to offshoring. But since most companies are reluctant to reveal their offshoring plans, we are all left to speculate about what kinds of jobs will go and what kinds will stay.

The third predicted employment effect is wage depression in jobs that are newly tradable across borders. All three of these effects, plus the lack of reliable data, are understandably creating a high degree of uncertainty and insecurity among US technology workers.

At the macroeconomic level, economists are debating whether offshoring is good for America. Nobel Laureate Paul Samuelson's recent article in the *Journal of Economic Perspectives*, for example, describes some very plausible scenarios in which offshoring can actually make America worse off. Ralph Gomory and William Baumol, in their 2001 book, "Global Trade and Conflicting National Interests" demonstrate that standard trade theory shows multiple outcomes for trading partners, some of which are mutually beneficial and others where one country gains while the other loses. Based on these important contributions we can conclude, contrary to the conventional wisdom, offshoring does not guarantee a better economic outcome for America.

It's important to keep in mind that conventional economic theories are generally developed around simplifying assumptions. For example, they use two or three-goods models and a limited number of trading partners. They do not explicitly take into account the impact of offshore outsourcing on technological innovation and national security. In reality, America's economic well-being is highly dependent on technological innovation, and that innovation cannot occur without a healthy and robust engineering labor market.

### **The Types Of Jobs Moving Offshore Are Increasing In Scale And Scope And Moving Up The Skill Ladder**

Some observers argue that only low level jobs are moving overseas. As one major news magazine put it, why should the US be concerned if 'mind-numbing' computer coding moves offshore. These pundits argue that offshoring simply frees up American workers to do more interesting tasks. This may comfort some but the empirical evidence does not support the notion that only low-level tasks are moving offshore.

It is clear that high-level engineering design has begun to move offshore, and the primary driver is lower wage rates. Many top technology firms, such as Microsoft, Intel, Google and others, have created research & development centers in low-cost countries. Venture capital firms, the institution many consider the lifeblood for future innovation and sunrise industries are increasingly requiring the start-up firms they fund to have offshore as much work as possible.

Another way to identify the types of jobs that are moving offshore is by searching the job openings posted on the websites of major technology corporations such as Intel and Oracle and others. My own analysis of these job sites shows many high level engineering openings at their Chinese operations. Many require advanced degrees and considerable practical experience.

High-level non-engineering support functions are also moving offshore. Professors Martin Kenney and Rafiq Dossani recently completed a revealing case study of a major US high-technology firm. The firm moved some of its financial operations to its office in Bangalore in 2001. The shift of tasks was so successful that the firm moved even more functions offshore. The firm was able to reduce costs, reduce headcount, improve quality and do so much more quickly than they had ever imagined.

There is no doubt that there will be some failures along the way, but it is clear that the overwhelming trend is for high-skill work to move offshore. One indicator of this is the remarkable growth of the offshore outsourcing companies in recent years.

### **Offshore Outsourcing Companies Are Not Small Players, They Are Market Leaders**

I have compared the financial reports for major IT services companies, and the results are striking. The table below shows that two of the major Indian IT services companies, Infosys and Wipro, have higher market valuations than their US based competitors, Electronic Data Systems (EDS), Computer Sciences Corporation (CSC), and Affiliated Computer Services (ACS). In 2004, for example, EDS had \$21 billion in revenue and a \$10.3 billion market valuation while Infosys, with only \$1.6 billion in revenue, had a \$20.5 billion market valuation. In other words,

**Infosys has twice the market capitalization of EDS on one-twelfth of the revenue.** This is important because IT services companies are priced based on revenues.

The reason for the high valuation of the offshore outsourcers is quite simple. The offshore outsourcers have higher profit margins. **In 2004, Infosys and Wipro had net profit margins of 31% and 20% respectively while EDS and CSC had net margins of 0.8% and 5.8%.**

### IT Services Business Models

	<u>Traditional Model</u>			<u>Offshore Outsourcing Model</u>		
	<u>EDS</u>	<u>CSC</u>	<u>ACS</u>	<u>WIPRO</u>	<u>INFOSYS</u>	<u>COGNIZANT</u>
<b>Market Cap (billions)</b>	\$10.3	\$8.1	\$6.2	\$15.3	\$20.5	\$6.5
<b>Employees</b>	117,000	90,000	43,000	46,500	36,800	15,300
<b>Sales (millions)</b>	\$20,669	\$14,059	\$4,106	\$1,865	\$1,592	\$587
<b>Net Profit Margin</b>	0.8%	5.8%	12.9%	19.5%	30.8%	17.1%
<b>Employee Growth</b>	-11%	0%	8%	45%	43%	66%
<b>Sales Growth</b>	0%	-5%	8%	39%	50%	59%
<b>Profit Growth</b>	-109%	56%	73%	58%	53%	75%

**Source: 2004 Annual Reports Submitted to US SEC**

These comparisons demonstrate that IT offshore outsourcers are not small players, they are market leaders. And rapid sales growth, for Wipro it was 39%, results in rapid job growth, 45% or 14,500 new workers. Infosys added as many employees in the last quarter, approximately 5,000, as it did in its entire preceding fiscal year. It is not uncommon for offshore outsourcers to double staffs from one year to the next. It is not simply coincidental that the IT job market in India is red hot, while the US market languishes. Many of the jobs being filled in India and other low-cost countries are substituting for US workers.

Rapid growth has enabled the offshore outsourcing firms to raise extraordinary sums from public offerings in the stock markets. At the same time that Google was raising \$1 billion on Wall Street last year, Tata Consultancy Services, the largest of the Indian IT firms, was raising a similar amount on the Indian stock exchanges.

Indian IT companies are able to earn significantly higher profit margins than their US counterparts, and therefore command higher price-to-sales and price-to-earnings ratios. They have higher profit margins because: 1) they use a higher proportion of offshore labor than their US competitors, 2) they benefit from generous tax incentives provided by the Indian government, and 3) they use US temporary work visa programs to fill rank and file positions.

The profit margins on work that is performed offshore are higher, and since the Indian companies have a larger share of their staff located overseas, they routinely earn much higher profit margins than their US competitors.

Adding to the profit margins, are Indian government tax holidays on software and Business Process Outsourcing (BPO) exports. This advantage is clearly observable in the effective tax rates for Infosys and Wipro, which were between 13% and 14%, while most US companies had effective tax rates of approximately 35%.

Lastly, many offshore outsourcing firms are using the US government administered H-1B specialty occupation and L-1 intra-company transfer temporary visa programs to gain competitive advantage. The vast majority of their employees in the US are H-1B or L-1 visa holders. They hire very few American citizens or permanent residents and in general do not sponsor their H-1B holders for permanent residence.

Conceptually, the H-1B visa program was intended to enable companies to hire foreign workers when American workers cannot be found with the necessary skills. In practice, most companies are not required to even try to hire American workers and many prefer to hire foreign workers on H-1B visas. The L-1 visa program allows companies to employ foreign managers and specialized knowledge workers at American facilities. Both programs have been and are being used in ways not intended by Congress. It is no longer just an issue of displacing US high-tech workers with H-1B and L-1 foreign workers with similar skills and at lower wages. The H-1B and L-1 programs are actually facilitating the export of US jobs and innovation.

Through these programs, enterprising foreign workers come to the US where they gain valuable experience and business contacts in their field. When their visas expire, many return to their home countries to establish or work for new entrepreneurial businesses that compete in the US market. Former H-1B and L-1 visa holders have significantly enhanced the competitiveness of India's IT services companies. Moreover, as confirmed in a recent study by Hal Salzman of the Center for Industrial Competitiveness at the University of Massachusetts, H-1B workers are being hired specifically by these companies to help transfer IT and other business services to their overseas locations.

On more than one occasion, IEEE-USA has offered to work with industry representatives in support of balanced reforms of the nation's permanent, employment-based immigration system. But so far the only immigration reforms that industry has advanced have been expanded H-1B visa caps and exceptions and weaker H-1B and L-1 visa workforce protections. H-1B and L-1 visas may help employers to find low-cost workers, but they do so in a manner that is unfair to both American and foreign workers. They are, in effect, a subsidy that facilitates the transfer of American jobs to overseas locations. Moreover, they undermine efforts to entice American students to choose careers in the sciences and engineering by reducing the students' chances of finding and retaining technical jobs whose rewards are commensurate with opportunities in other employment sectors.

Due to their relatively low profit margins, more and more US-based companies such as IBM, EDS and CSC are being forced to adopt the market leaders' business models and practices. For example, EDS announced they were moving 20,000 jobs from high-cost to low-cost countries.

Indian IT firms, concerned about the entry of even lower cost providers from China, are opening operations there. India may be the first-mover, but many other developing countries are trying to replicate India's success. So, the supply of low-cost, high-skill talent will continue to increase.

### **Companies Are Acting Rationally But So Are Workers**

By offshoring, company executives are pursuing what they believe is in the best interest of their shareholders. They believe that offshoring will improve their profits by cutting costs. Enough

companies have done it successfully to induce most other major firms to attempt it. We are at the stage when major companies are moving from pilot offshoring experiments to full deployment, and it is not unusual to hear of firms reaching 10,000 head counts in low-cost countries.

Executives should not be vilified for offshoring since they are pursuing what they believe is in the best interests of the companies. On the other hand, workers too are acting rationally by voicing very justifiable questions and concerns about how offshoring will affect current and future job opportunities in the United States.

But, as I said earlier, even mainstream economists agree that offshoring does not ensure that the US will be better off. What is good for companies' bottom lines may not necessarily be good for America. We should be focused on designing policies that ensure the very best outcomes for America, not just what is in the interests of multinational firms.

### **Compensation for Individuals Adversely Affected by Offshoring**

One proposed policy recommendation is to compensate those who are adversely affected by offshoring. Unfortunately, the offshore outsourcing of high-skill jobs has a number of characteristics that make it hard to compensate those who are adversely affected:

- It is often difficult to identify workers who have been displaced, many of whom may not even know that they have been displaced, because of trade. Companies are often reluctant to reveal offshoring their plans for fear of the bad publicity that will result. Many workers may be reluctant to publicly identify themselves, for fear of losing the severance package offered by their employers or being blacklisted by other employers.
- Even if were possible to identify workers who have been adversely affected by trade, it is not clear how we they should be compensated. Do we offer subsidized re-training in some other profession?
- Re-training and other types of transitional assistance programs have proven difficult and expensive to implement. Is it realistic to expect an electrical engineer with 20 years of experience to spend four years studying to become a nurse?

In sum, we think it is entirely misleading to characterize offshore outsourcing as a “Win-Win” proposition for America and for American workers, as offshoring advocates so often do. The burden of proof should be placed on those advocates to demonstrate how workers who have been adversely affected will be compensated and helped to become productive citizens once again.

These advocates assume, as part of their argument, that displaced American workers will be reemployed. Instead of assuming, we should ensure that such workers are reemployed in equally highly skilled and highly paid positions.

## **Technological Innovation, Economic Growth and National Security Implications**

America's economic competitiveness and national security are increasingly dependent on the superiority of our technology and technical know-how. There is a widespread belief -- almost a blind faith among many policy makers -- that as communications, semiconductor manufacturing, electronic devices and other key technological capabilities are offloaded to other countries, the United States will just move on to the next field, to the next "big thing."

Many observers, including government officials, argue that the next "big thing" is going to be nanotechnology, and that nanotechnology is going to generate enormous economic benefits and create many new jobs. We can only speculate on the impact that nanotechnology will have on the economy and jobs, and hope that it will be as significant as some predict.

At the same time, we should not be complacent. As a nation, we are not alone in our efforts to advance the frontiers of nanotechnology. China is the second largest producer of technical papers in nano-science and nanotechnology, even ahead of Japan. Given its very substantial cost advantages, we should anticipate that China will compete strongly for new nanotechnology jobs and manufacturing opportunities. China has also been increasing its science and engineering talent pool at all levels, especially with a rapid increase in the number of Doctorate holders.

History tells us that technological catch-up often occurs much more rapidly than expected. Russia and China acquired atomic capabilities very shortly after we did. We never expected the Russians to beat us into space with Sputnik. We also underestimated the speed at which Japanese companies would move up the value chain in manufacturing. We are not guaranteed our technological leadership and certainly can't afford to take it for granted.

The recent sale of IBM's PC line to Chinese manufacturer Lenovo was a watershed event in the history of information technology. As it was designing its PC in 1979, IBM outsourced two critical components (components that managers believed were not core), the microprocessor to Intel and the operating system to Microsoft. IBM did so in spite of its in-house ability to produce both the microprocessor and operating system. Clearly Intel and Microsoft have benefited the most from the PC revolution, and America as a country benefited since Intel and Microsoft kept most of their jobs in the US. Will America face the same fate as IBM as we outsource the critical components of our future to other countries?

U.S. manufacturing has also been hit hard by offshore outsourcing. This has important and serious consequences for US engineers and for technological innovation, economic growth and national security. Some wonder whether manufacturing matters very much any more since it only accounts for about 13% of the Gross Domestic Product. However, from a technological innovation point of view, manufacturing matters greatly. In 2003 nearly 41% of American engineers worked in manufacturing. According to the National Science Foundation, the manufacturing sector accounts for a disproportionately high, 62%, of all research and development (R&D) in the US. Given current management strategy to locate R&D as close to manufacturing production as possible, it seems inevitable that as manufacturing moves overseas, engineering design and R&D will follow.

A year or so ago, I dubbed the policy dialogue on offshore outsourcing as the New Competitiveness Debate because I think there are lessons to be learned from the manufacturing

competitiveness debate of the 1980s. Many of these have been extensively chronicled by Dr. Kent Hughes in his new book, *Building the Next American Century: The Past and Future of Economic Competitiveness*. The most important lesson is that it takes time and creativity to generate sound public policy. There were many significant policy changes that improved the competitive position of the US in the late 1980's, including the creation of the Technology Administration. Many of the best ideas came from the state and local levels, what policy academics often call the "laboratories of innovation." Some policies might even be called protectionist, like voluntary quotas in the steel, automobile and semiconductor industries.

The key difference between what I call the New Competitiveness Debate and the one in the 1980's is that today workers are much more likely to be adversely affected than companies. That reality changes the feasible region and constraints on potential practical and politically acceptable solutions, and I suspect makes it much more difficult to move forward. Many companies will be able to adapt to the new competitiveness challenge by substituting foreign for US labor. Even if they succeed against their competition it may be without US workers. The current competitiveness challenge has companies pitting US workers against foreign workers, as companies take the latest technology and capital to the lowest cost labor. This creates a practical problem because most of our established policy mechanisms are designed primarily to help companies succeed. For example, increased government R&D spending may lead to breakthroughs in nanotechnology in the US, but the bulk of the job creation from design, development and production may take place overseas as companies transfer the latest tools, technologies and techniques to low-cost overseas locations. That means we need to create new mechanisms that are focused on US workers so they can differentiate themselves from their foreign counterparts. This is much more difficult than most people realize.

## **Policy Recommendations**

The economic and employment challenges associated with offshore outsourcing are complex. There are no easy answers or silver bullets in terms of public policy recommendations. But there are some practical and immediate steps that we can take. I would note that to date the federal government has taken essentially no steps to respond to this major structural economic change.

- The federal government must begin regularly tracking the volume and nature of the jobs that are moving offshore. We commend Congressman Frank Wolf for earmarking \$2 million for an offshoring study in last year's omnibus spending bill. This should be viewed as an important first step in the right direction and one that more agencies should follow. We also commend Senator Joseph Lieberman for his report, "Data Dearth in Offshore Outsourcing: Policymaking Requires Facts."
- We need *different, not more*, engineers. The federal government must begin working with engineering professional societies and engineering faculty to explore how US engineers can differentiate themselves from foreign engineers. It is clear that US engineers cannot compete with foreign engineers on the basis of wages. In addition to the wage differential, companies are taking the latest tools and technologies to low cost foreign labor, thus blunting a traditional advantage for US engineers. Compounding all of these problems is the secretive manner in which companies are shifting work offshore. For US engineers to differentiate themselves from their

foreign competitors, they need to know which jobs are going and which ones are staying. More education does not make one immune from the negative effects of offshoring. We need engineers with a skill mix that matches the new demand profile.

- The federal government must make post-graduate engineering education attractive to US citizens and permanent residents by offering targeted scholarships with stipends high enough to attract the best and brightest students. We should continue to recruit students from abroad but we should also recognize they have many more options because of offshoring. Foreign students who study here are finding increasingly attractive opportunities at home and many of the best and brightest are eschewing graduate work in the US for better opportunities at home. It is obvious that we will have to become less reliant on foreign students to fill our graduate engineering programs. Because the opportunity costs for domestic students are much higher than their foreign counterparts, new and targeted stipends for domestic students should be set high enough to induce more US students to pursue graduate work in engineering.
- Companies should be required to give adequate advance notice of their intentions to move work offshore so that soon-to-be displaced employees can make appropriate plans to minimize the financial hardship and government support agencies can prepare to provide the necessary transitional assistance.
- Congress should rethink how U.S. workforce assistance programs can be designed to help displaced high-tech workers become productive again. We are in a new era of work and lifelong learning, and new and more flexible methods are needed to provide meaningful assistance.
- Congress should strengthen H-1B and L-1 workforce protections and enforcement mechanisms to ensure that the programs serve their intended purposes without adversely affecting employment opportunities for U.S. high-tech workers.
- Substantive changes in U.S. immigration law, such as those incorporated in the recent Chile and Singapore Free Trade Agreements, should be made by Congress, and not by trade negotiators.
- Congress should take affirmative steps to ensure that the U.S. retains the human talent and production capabilities needed to develop and utilize technologies deemed critical to U.S. national and homeland security.
- As globalization narrows U.S. technology leadership, the Department of Defense and other national security agencies will have to enhance their ability to acquire and assimilate foreign technologies.
- The U.S. will need a coordinated national strategy in order to sustain its technological leadership and promote job creation in response to the concerted strategies being used by other countries to attract U.S. industries and jobs. Senator Joseph Lieberman's proposal to create a Presidential Commission on the implications of outsourcing is a step in the right direction.