Implications of Offshore Outsourcing
Remarks
by
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This document is a set of rough informal observations on some of the characteristics and potential impacts of offshore outsourcing and offshoring on the U.S. It also proposes some potential policy responses.

1. Synopsis

There's a growing debate among technology companies, workers, economists and policymakers as to whether the movement of high-skill jobs overseas is good or bad for America.

A number of self-serving studies by companies such as McKinsey declare that offshore outsourcing is a 'win-win' for both the U.S. and the countries gaining those jobs. These studies do not acknowledge that there are many uncertainties in any economic change. It's quite likely that the world economy will be a winner, as other nations enjoy increased access to U.S. investment, markets and technology. But will the U.S. be better off? We really don't know, and anyone who provides a definitive answer one way or the other is practicing fortune telling.

What we do know is that there will be winners and losers in the U.S. Many American workers and organizations will suffer. We also know that large U.S. companies believe that it is within their interest and they will benefit by moving work overseas and will lobby for the unfettered ability to do so. They have already begun to label any idea that they disagree with as 'protectionist', a term with such negative political connotations that potentially useful solutions are forced off the table before they can even be considered.

The real question is not whether offshore outsourcing is good or bad, because it is already happening and will continue to accelerate, but how we find effective ways to mitigate its significant negative impacts. In this vein, I suggest that the government take the following actions.

1. The government must begin regularly tracking the volume and nature of jobs moving offshore. The lack of objective data distracts us from the real issue of solving the problems created by offshore outsourcing.

2. Congress should reform the temporary visa programs for high-skilled guest-workers. They have been misused by many to import cheap labor and accelerate the pace of offshore outsourcing. It is difficult enough for American technology workers to compete with low cost labor from halfway around the world; it is unreasonable to expect them to compete with low cost guest-workers here because of visa regulation loopholes. Certain types of work, because of its nature, must be done in the U.S., and it is reasonable to expect that this work should be done by American workers. Instead we have a guest-worker policy that displaces American workers in favor of foreigners for work that cannot be done overseas.

Of the bills pending in Congress that would reform the H-1B and L-1 visa rules, the Dodd/Johnson bill seems to be the most sensible because it adds safeguards for U.S. workers without reducing the benefits the programs provide to America's technological competitiveness. Similarly, fundamental changes in U.S. immigration law, such as restricting Congress' ability to improve the H-1B and L-1 programs, should not be made by trade negotiators. The recently approved Chile and Singapore Free Trade Agreements severely limit Congress' ability to add safeguards for American workers to the visa programs.

3. Congress should rethink how U.S. workforce assistance programs can best help displaced high-tech workers become productive again. That is no easy task. What exactly will you retrain people to do? Will it be a set of skills that doesn't quickly diffuse overseas? Who will pay for resources required to do this? IBM's CEO and other proponents of education and retraining as the answer for displaced workers are vastly underestimating the cost and difficulty in retraining. Nevertheless, we need to begin the experiments immediately.

4. The U.S. needs a coordinated national strategy designed 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.

We can learn many lessons from the policies implemented in response to the decline of U.S. manufacturing beginning in the 1980s. For instance, it will take time, creativity, and a collective will to generate good policy responses. However, a key difference makes the search for solutions more difficult: workers alone are being adversely impacted whereas in the 1980s both companies and workers lost. Advocates of offshore outsourcing must ensure (not just assume) that we do not have a great deal of idle human capital in the U.S. It is not sufficient to call their displacement 'painful' and hope for rosy redeployment scenarios. We should set aside the labels and begin to work constructively together to address the real losses - human, economic and innovation - that America will experience from it. If this is done sensibly it will make offshore outsourcing an actual, rather than hoped for, 'win-win'.

2. A Quick Review of the Rise of Offshore Outsourcing as an Issue

In November 2002, John McCarthy, an analyst for Forrester Research, Inc., predicted that 3.3 million white collar jobs would move from the U.S. to developing countries. Picking up on this prediction, Pete Engardio and his staff at BusinessWeek prepared a cover story for the February 3rd, 2003 edition with the ominous title, Is Your Job Next? The subtitle was, "A new round of Globalization is sending upscale jobs offshore. They include chip design, engineering, basic research – even financial analysis. Can America lose these jobs and still prosper?" This was and still is the appropriate question to ask and try to answer.

Three weeks following this cover story syndicated columnist and former Reagan Treasury official, Paul Craig Roberts, wrote a column called, "Lethal Outsourcing", in which he characterized the offshoring trend described in the BusinessWeek article as potentially lethal to the U.S.

After that things were relatively quiet in terms of coverage of the issue. In fact, in March 2003, I went to Bangalore, India to present a paper on India's Information Technology (IT) industry. There were a number of businesspeople there who were confident that they would begin to capture further white collar services work, but I must admit that I was skeptical. I felt that there were limits on the amount of work that could be done offshore effectively and efficiently. Also, the job market in India in March, 2003 was lukewarm at best. Engineers from the top universities were getting placed, but pull and connections were still a large part of the process.

By June, 2003, there was an increasing number of news stories appearing in the Indian press (thanks to the internet they were easily accessible) of companies expanding operations in India. What surprised me most was that it was no longer niche players such as IGate or the India IT firms like Infosys, but now the major U.S. IT companies like EDS and Texas Instruments (TI). New announcements appeared almost daily and the numbers were beginning to add up. Planned additions of 2,000 positions and/or plans to double staffs in India were quite common. My cousins in India confirmed that the IT job market had changed markedly between March and June – in their words it was in a "frenzy". There were two things about these trends that startled me. First, these were major U.S. multinational companies and they were new to using India a source of labor. While General Electric had been doing this for some time and TI had some operations in Bangalore, this was a very new thing for EDS. Second, these same companies were holding employment flat in the U.S. and in many cases laying people off in the U.S. Another interesting element to this story was that the U.S. press was not reporting any of these developments.

During this same time, U.S. electrical and electronics engineers (EEs) and computer scientists were facing the worst job market ever recorded by IEEE-USA. Unemployment for EEs were at unprecedented heights and at nearly every local IEEE section the first topic of conversation was jobs and job security.

On June 11th, 2003, I had the opportunity to present some of these ideas to the Council on Competitiveness' Breakfast Bytes meeting sponsored by the Sloan Foundation. The following week, under the leadership of Chairman Manzullo (R-IL), the House Small

Business Committee held a hearing on the issue at which I testified. After that hearing, the U.S. press began to take notice of the issue and some of its implications.

And as more announcements came, the American press began to report the story in increasing intensity. Andy Grove's, founder of Intel, comments at a Business Software Alliance meeting brought even more attention to the issue, spurring another hearing by the House Small Business Committee. Today it has reached what seems to be a fevered pitch. Interestingly enough, the issue is not unique to the U.S. The U.K. and Australia are also grappling with offshoring of jobs and even Singapore is devising strategies to move up the value chain as more of its staple work moves to lower cost centers.

2.1 Some Definitions
Before I go any further, I'd like to clear up some confusion in terminology.

Outsourcing is simply a customer deciding that they no longer want to make part of their product or process in-house, but would prefer to purchase it from some other organization. This is also known as a classic 'make or buy' decision, something that everybody does everyday such as whether we would like to clean our own house or outsource it to a maid service. In the IT services industry, it is an important term because many large companies decided over the past decade that they no longer wanted to manage their own internal Information Systems department and instead outsourced the whole function to an IT services firm. An example of this is when Procter & Gamble decided to outsource its IT function to Hewlett Packard in a contract worth about $3 billion.

Offshore Outsourcing is where companies service their customers from overseas locations. Some companies in this business include, Cognizant, Infosys, IGate. On the other hand, *Offfshoring* is the practice of a single multinational moving work from its domestic sites to locations overseas – the prominent case in the past few weeks is IBM, which plans on moving nearly 5,000 of its programming positions to India and China.

There are also many additional combinations with interesting modifiers, like Best Shore, Near Shore and Blended Sourcing.

Lastly, there are companies engaged in *on-site offshore outsourcing*, such as Tata, Wipro, Infosys and Satyam. In this case companies bring in lower cost foreign labor on guest-worker visas such as the H-1B or L-1 to do work on-site in the U.S. An example of this is what Tata Consultancy Services (TCS) proposed to do with a $15 million State of Indiana IT contract, which was subsequently canceled. TCS planned on bringing approximately 65 guest-worker programmers to service that contract. According to TCS, those workers would be paid approximately $36,000 per year, which is significantly below the starting salary of a graduating computer science major.
These distinctions are important because they may lead to very different policy prescriptions.

Additionally, in the language game, observers need to be on the look out for new code words, like *rebalancing* the workforce. Many of the companies now engaged in 'offshoring' have been using this euphemism to represent the shift of its labor force from America to overseas locations. This is akin to the euphemisms of the early 1990's like re-engineering and rightsizing used in place of downsizing.

Within the offshoring jargon, there are a few other terms that are important to note. *Business Process Outsourcing (BPO)* is a set of basic business services that are outsourced or offshore outsourced. These business services can be any basic back office operation from accounting and tax preparation to insurance claims processing. BPO is sometimes called, *IT Enabled Services (ITES)*, in India.

2.2 Why Do Companies Utilize Offshore Labor?
Improvements in telecommunications technologies, such as the internet and lower long distance costs, have all facilitated or enabled the ability of firms to work with remote locations. The larger trend of Globalization has also provided the right kind of environment for this process. There are a number of other elements that have contributed to the increase in offshoring.

First and foremost is cost. High-skill educated labor is far cheaper in many developing countries than in the U.S. The labor cost savings can be as high as a factor of 90%, but when one counts the additional burdens of management and other costs the net advantage is probably closer to 30% or so. Why is high-skill labor so much cheaper in other countries? Part of the reason has to do with excess labor in those countries, but one of the more important reasons is that the workers can afford to be paid less. The cost of living for them is significantly lower.

Salary Requirements for Equally Well-Off Engineers		
Country	PPP	Salary
U.S.	1.0 * $70k	$70,000
Hungary	0.367 * $70k	$25,690
China	0.216 * $70k	$15,120
Russia	0.206 * $70k	$14,420
India	0.194 * $70k	$13,580

The table above shows the salaries for equally well-off workers in various countries. The factor, PPP, being multiplied in the second column is Purchasing Power Parity, a cost of living measure created by economists to show the differences in price that are not captured by currency valuations. So, a Russian engineer earning $14,420 would live an equally good life as an American engineer with a $70,000 salary. The PPP numbers in the table are sourced from the World Bank and ICP program.

PPP is only a rough estimate, since not all goods and services are available in each country, but I think there might be an important implication. It makes the prospects of a Russian or Indian living in their country less likely to demand salaries much in excess of what makes them quite well off. In other words, some people speculate that wages for Indian engineers will skyrocket soon, but I think that the enormous PPP disparity will act as a governor on those salary demands. It should also be clear that these foreign workers are not being paid their marginal product. Lastly, U.S. engineers cannot afford to compete on price with many of the engineers because they live in a high cost of living country.

In addition to cost, there are other claims about why work is moving offshore. For example, some argue, particularly in industry, that there is a shortage of technically trained U.S. workers. I am skeptical about this line of reasoning for two reasons. First, enrollments in engineering, computer science and information technology are up significantly in the past few years. Second, the following table showing the third quarter unemployment statistics for technology workers which shows that there is abundance of technology workers in the U.S.

Third Quarter, 2003, Unemployment Rates for IT Occupations		
Occupation	**Workers (000's)**	**Unemployment Rate (%)**
All Managers	14,815	2.9
Computer & Information Systems Mgrs	375	5.5
Engineering Managers	79	8.0
All Computer Occupations	3,047	6.0
Computer Scientists & Systems Analyst	748	4.8
Computer Software Engineers	802	4.6
Computer Programmers	598	7.1
Computer Support Specialists	334	7.3
Network & Computer Systems Admin	141	7.6
Network Systems & Data Comm Analyst	424	5.0
Computer Hardware Engineers	135	6.9
Electrical & Electronics Engineers	374	6.7

To put a more historical perspective on it, below is the unemployment rates for the civilian population, electrical engineers and computer scientists for the past 20 years.

Unemployment Rates for Selected Occupations: 1983 - Present
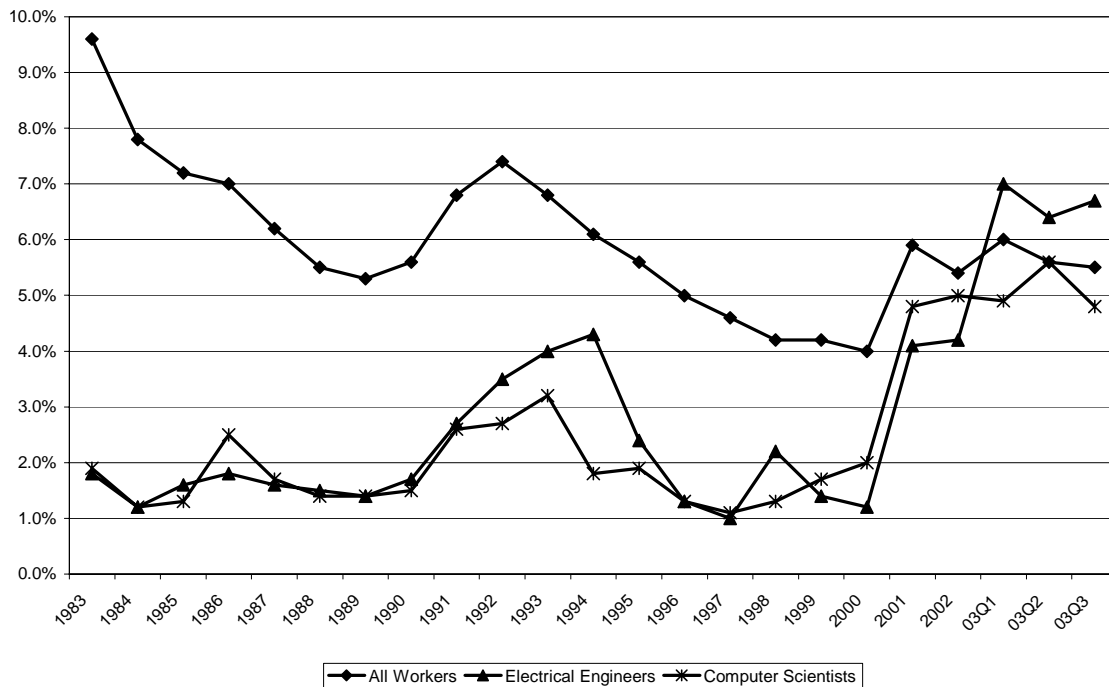
As you can clearly see, the rates for EEs and CS workers have jumped rather dramatically relative to general downward trend for all civilian workers. In the 30 plus years that the Department of Labor has been collecting statistics, the past two years are the first in which unemployment rates for electrical, electronics and computer engineers are higher than the unemployment rate for all workers. For comparison purposes, the unemployment rate for electrical engineers was 1.2% in 2000, less than one-fifth its current level. And throughout the 1980s, at a time when unemployment rates for all workers got as high as 9.5%, electrical and electronics engineering unemployment rates never rose above 2%. This employment situation is not just because of the 'dot-com bust' or 'telecom meltdown', this is a structural change in the labor market. There are many engineers who were gainfully employed long before the dot-com boom/bubble who cannot find work now.

Everyone agrees that investments in education are important to all segments of society in order to improve technical literacy and enhance skills. But it should be noted that increased education spending to expand the pool of highly skilled U.S. scientists and engineers will fail if there are not rewarding and reasonably secure career opportunities in those fields upon graduation. In that regard, I would point to the observations of noted demographer Dr. Michael Teitelbaum in a recent article (Do We Need More Scientists?) for *The Public Interest* (No. 153, Fall 2003):

> Instead of raising the false flag of shortages, those concerned about the
> future of science and engineering in the United States should encourage

objective appraisals of current career paths, as well as innovations in higher and continuing education designed for more agile adjustments to inevitable changes in these dynamic fields. The overarching goal should be to find ways to make these careers attractive relative to the alternatives, for this is the only sustainable way to ensure a supply commensurate with the United States' science and engineering needs.

Companies also choose to move work offshore because of the industrial policy strategies by foreign governments. For example, Russia agreed to purchase Boeing planes only if it located some of its design engineering in Russia. China also seems to be quite good at ensuring technology transfer in its deals. On the carrot side of the carrot-stick equation, some countries are involved in active smoke-stack chasing, where they provide tax holidays for targeted industries and exports. The Indian IT is a case in point.

Other reasons cited for moving offshore include the ability to take advantage of time zone differences and provide 24/7 production capability.

But the most important reason why companies are moving work offshore is that the managers are now aware of it as a possibility, and more importantly perceive it as something they must do because their peers are. The practice is becoming institutionalized at so many companies. A new job title - "Global Supply Coordinator" – has even been created to describe a new cadre of managers who are responsible for figuring out how best to move work to overseas locations and how best to manage it when it gets there.

3. What Are the Likely Impacts of Offshore Outsourcing and Offshoring?

3.1 How Will Offshore Outsourcing Impact the U.S.

This is *potentially* a major shift in how our economy operates and it will have some impact on economic growth, national security, the distribution of income, and the workforce. These impacts will be both positive and negative.

On the positive side, the hope is that it will help lift U.S. economic growth and development by lowering input costs of services and expand and open new markets abroad. There are also positive geo-political consequences from increased trade and having poor countries begin to develop.

There are number of areas in which there is some uncertainty on the direction of the impact. We don't know how this shift will affect U.S. competitiveness and our national innovation system. America's economic competitiveness and national security is increasingly dependent on the superiority of our technology and technical know-how. There is a widespread belief -- almost a blind faith -- that as communications, semiconductor manufacturing, electronic devices and other key technological capabilities are off-loaded 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 significant as some predict. However, we should not be complacent. As a nation, we are not alone in our pursuit of the frontiers of nanotechnology. China is currently the second largest producer of technical papers in nanoscience and nanotechnology, even ahead of Japan. With great cost advantages in addition to this advanced technical knowledge, we should anticipate that China will compete strongly for new nanotechnology jobs and manufacturing opportunities.

U.S. manufacturing has also been hit hard by offshore outsourcing. This has important and serious consequences for U.S. engineers and for technological innovation, economic growth and national security. Some wonder whether manufacturing matters very much since it only accounts for about 15% of the Gross Domestic Product. However, from a technological innovation point of view, manufacturing matters greatly. Nearly 48% of American engineers work in the manufacturing sector. The manufacturing sector also accounts for 62% of all research and development (R&D) in the U.S. The prevailing management approach is to locate R&D as close to manufacturing production as possible. As manufacturing moves overseas, it is inevitable that both engineering work and R&D will follow.

At this stage in the process, in spite of the rhetoric by industry, the jobs being created abroad are to a reasonable extent at the expense of workers here. Many American workers are being displaced and are not being redeployed in our current jobless recovery. The implications, with respect to taxes and the economy, of this are obvious. The chilling effect it is having on technology professionals is immeasurable. Job insecurity is extremely high and many of our nation's best and brightest students are already shying away from studying technology disciplines in college. They don't see a viable and stable career in IT work.

What all of this does not capture is some of the more subtle aspects of the innovation capacity of a country. Does it matter whether these companies keep technology jobs here? I think there is a compelling case to be made about the spillover benefits from these industries and these jobs. Many of the entrepreneurs who start the technology companies of the future will get their own start in today's technology companies. There are countless stories of technologists who learned the ropes from an established technology company only to split off later and begin their own successful firm. Intel got its start out of Fairchild Semiconductor. Ross Perot worked for IBM before starting EDS. The German software maker, SAP, got its start when its founders left IBM in Germany. Thomas Siebel, founder of Siebel systems, worked for Oracle.

There are even less visible impacts on innovation, such as who gets to set technical standards for the next generation of technologies. Technical standards setting is an increasingly complex process and is becoming more critical for technology businesses. A recent story about how the Chinese government is setting its own software standards for

the next generation of wireless computers, mobile phones, and DVD players might be an indication of this.

We've had an active policy for the past 58 years to maintain a strong science and engineering workforce in the U.S. for economic and national security reasons. Again, there are many spillover benefits to having this technical human capital here. As more work moves offshore, the Defense Department will have to beef up its ability to acquire and assimilate foreign technology. There are also potential questions about the critical data being housed offshore for Homeland Security.

As a nation, we've benefited enormously from the so-called brain drain of other countries. The best and brightest from all over the world have been attracted to the opportunities that America affords them. Offshoring seems to have already changed the relative level of attractiveness for the best and brightest. Opportunities in their home countries are already much more attractive than they once were.

There are other issues of international governance. Intellectual property rights enforcement is weak in many of these countries, but companies themselves will need to evaluate whether the reward is worth the risk.

3.2 How Will Offshoring Impact Developing Countries
From the perspective of the developing countries who are gaining these jobs, there are many positive impacts. Many of them have identified this as the best path to growth as many of them try to replicate India's success. Their comparative advantage is low labor costs. They are not only gaining technological knowledge, but more importantly they are learning the business practices of the leading corporations in the world. They are also moving up the ladder of innovation and there are many macroeconomic advantages, particularly with respect to current accounts. Most importantly, these countries have finally found a way to begin to utilize a hitherto idle labor force.

If I was advising these countries, I'd point out some of the potential risks that they might face. As companies figure out how to move these jobs from America to one developing country, it will likely be easier for them to move again. Right now, the Mexican Maquiladoras seem to be losing the battle with Chinese manufacturing, and this may be something that is replicated in services, as more developing countries target these jobs and industries. In fact, in some ways it might even be easier to move services jobs, potentially leading to something akin to a race to the bottom as countries begin to smoke-stack chase.

The bottom line is that offshoring will create positive impacts in both the U.S. and developing countries, but there could be some serious negative impacts in the America. We also don't know the extent of those impacts.

4. What Types of Jobs and How Many Are Moving Offshore?

A spate of recent studies from forecasting firms predict the number of jobs that will move overseas. I am reluctant to quote any one of them because they are all speculative in nature. However, it is clear from all of these studies that there is a growing consensus that offshore outsourcing of high-skill jobs will not only continue but accelerate and expand to include an ever widening cluster of occupations.

Let me also emphasize that these are not low-level jobs that no Americans would want, but high-skill/high value added positions filled by some of our best and brightest engineers and computer scientists. I have heard enough anecdotal evidence from experienced engineers with advanced degrees facing problems to believe that it is becoming more common. Companies are not only moving production overseas, but engineering design and research and development as well. In some cases, American engineers have even been given the choice of being laid off or moving to another country, but at a much lower level of compensation than they had been earning in the United States.

Having said that, the bottom line is we really don't know which positions and how many will move offshore. There are a few reasons for this uncertainty. First, most of the reports come from 'research' firms that also happen to have consulting practices in helping companies shift work overseas. They may have an interest in overestimating the trends a bit in order to convince clients that this is something the clients' peers are already doing. Second, the companies shifting jobs overseas are doing it in a hush-hush manner. They do not want to call attention to their plans or activities in fear of a public backlash and more importantly a stateside employee backlash. Third, and most importantly, the government has yet to publish any objective statistics, which I assume is because the agencies haven't collected the data.

4.1 Uncertainty Provides Opportunities for Competing Studies
We have heard many people debate whether offshoring or offshore outsourcing is good or bad. Anyone who tells you it is all bad or all good for the U.S. is being very simplistic in their reasoning. We have seen a number of 'studies' that declare that outsourcing is a "Win-Win". One study in particular by McKinsey has been promoted by them as "The *Real* Economics of Outsourcing." There are many weaknesses in this study, but I will only highlight a few:
- Much of the data in the study is gathered from case studies done by McKinsey consultants – the data is not available for others to review
- There are no models provided in the study, so there is no way to even discuss whether the assumptions and models are realistic and/or to complete a sensitivity analysis on the models
- The study *assumes* that workers who are displaced by offshore outsourcing will be "redeployed" soon at substantially the same wages. This seems to be a very strong assumption considering the job creation of the past three years.
- The study's most critical weakness is that it's devoid of any discussion on potential impacts (costs and benefits) on U.S. innovation and security.

Any study that calculates the value of offshoring to the U.S. at the confidence level of a penny on the dollar is extraordinary.

The study authors do not reveal the financial interests that McKinsey Consulting has in the direction of the offshoring market. If the offshoring market increases, McKinsey is sure to benefit. McKinsey has had NASSCOM, the Indian Software Services Industry Association, as a long-standing customer and they have jointly issued a number of reports on the Indian IT industry. Additionally, McKinsey sells offshoring consulting services. This study would be surprising if it did not come to the 'Win-Win' conclusion.

Anyone who has followed the exhaustive discussion for the past twenty years about the Information Technology Productivity Paradox will attest to how difficult it is to calculate returns on investment at the firm, industry or country levels. In fact, Professor Robert Solow from MIT won his Nobel Prize by showing that more than 50% of economic growth of the U.S. in the first half of the last century could *not* be explained. By chance he happened to call the residual, *technological change*. Keep in mind it is the *unknown* part of economic growth that happens to be labeled technological change.

The point is that there are many uncertainties in any economic change, and offshoring is no exception. Like most structural changes, there are winners *and* losers in offshoring. Will the world economy overall be a winner? Most likely.
Will the U.S. be better off? We really don't know. Anyone who provides a definitive answer one way or the other is practicing fortune telling.

If we look within the U.S. economy there is certain to be many people and organizations made worse off because of offshoring. The real question is not whether it is good or bad, but how one compensates those who are going to be adversely affected by it.

It is a moot point to discuss why U.S. corporations have decided to offshore more of their work because they view it as a way to improve their operations. Their pat answer is that it is the great force of "global competition" that is beyond their control. We could debate the credibility of this faceless un-attributable explanation, but at this point it is rather unimportant. In our current environment, there seems to be little to be gained by hoping to appeal to their role as a U.S. company, and one really can't blame their actions. The corporate managers are doing what they believe is in the best interests of the company.

5. A Potpourri of Proposed Policy Solutions

5.1 The Comfortable Solution – Education & Retraining
Rather than debate the why, we should begin to move the dialogue along to searching effective solutions. Some in industry have begun this discussion. Most (like Andrew Grove) have zeroed in on the idea of making U.S. workers more productive by improving education and re-training efforts. This seems to me to be a good and obvious answer. Unfortunately, it is a problematic answer, because none of the proposals that I am aware of have gone beyond the generic talk about education and productivity. This is one of those proverbial, devil's in the details, kinds of proposals, in which no one has put forward concrete details, let alone resources (read $s) for this. I have doubts about how these programs could be designed and implemented to be effective. What exactly will

you retrain people to do? Will it be a set of skills that doesn't quickly diffuse overseas? Who will come up with the resources to do this?

Let me provide you an example of why I'm a little skeptical about this seemingly good potential solution. Sam Palmisano, CEO of IBM, is the co-Chair of the Council on Competitiveness' New Initiative on Innovation (NII). At the kickoff of the NII, Mr. Palmisano announced that IBM was setting aside $200 million to re-train 100,000 of its workers. Sounds like a lot of money until you do the math and figure out that it is $2,000 per trainee, about the cost of a college course. My sense is that proponents of education and retraining are vastly underestimating the cost and more importantly the difficulty in re-training.

Also, it is often difficult to directly identify workers who have been displaced, many of whom may not even know that they have been displaced because of trade. Companies are increasingly reluctant to reveal their plans for fear of the bad publicity that will result. Many workers are too intimidated to publicly identify themselves. They fear losing the severance package offered by their employers or that they will be blacklisted if they speak out.

Even if we could identify those who have been adversely affected by trade, it is not clear how we should compensate them. Do we offer subsidized re-training in some other profession? Is it realistic to expect an electrical engineer with 20 years of experience to spend four years studying to become a nurse, an occupation that is *predicted* to grow?

Others claim that displaced U.S. workers are now 'freed' up from tedious work and can work on more interesting things such as 'project management' which will stay onshore and colleges should focus on that training. This thinking is flawed for two reasons. First, the assumption that project management will remain onshore, because it should be close to the customer, is balanced by the need to locate project management activities offshore close to where the work is being done. Second, this assumes that freshly minted graduates can leap right into managing a project without ever having any experience working on a project. As someone who teaches project management, I can attest to the fact that it is much more experiential and learning by doing than something that can be taught in a classroom. The future technology managers are nurtured through a natural maturation process that includes getting your hands dirty as a technologist.

5.2 The Holy Grail Solution – Increase Software Productivity
If I understood his speech at the Business Software Alliance correctly, Andy Grove also suggested that we try to double software productivity by investing presumably in R&D and new technology. The idea is to eliminate the labor cost advantages of developing countries by making American software engineers more productive. This again seems like a very good thing to do, but it again poses a few problems.

First, can it be done? Software makers have been searching for ways to automate the process for years because it is still essentially a labor intensive craft industry whose major input cost is labor. In fact it is the holy grail of software development. DARPA has been

pumping money into Computer Aided Software Engineering (CASE) tools for years, and while there has definitely been some progress in automating the processes and making software production more reliable, it has been mostly incremental in nature. I believe that Mr. Grove used a figure of about $1 billion in his talk. Microsoft alone spends about $4 billion per year on R&D.

Second, if it could be done, what prevents the better technology or know-how from diffusing quickly to developing countries?

5.3 When The Only Tool You Have is a Hammer Everything Looks Like a Nail - Solutions That Make Sense But Don't Solve the Offshoring Problem

Since Mr. Mehlman is on the same panel, I'll address the recent Computer Systems Policy Project report Choose to Compete. This document has many sensible recommendations such as improving K-12 education, making permanent the R&D tax credit, increasing natural science research spending, and improving the technology infrastructure. However, almost none of the recommendations, save for a very small reference to worker retraining, addresses the how one solves the problems that offshoring creates for American technology workers. This document looks like it could have been written 3 years ago, long before anyone was discussing offshoring.

There is no doubt that American technology workers are dependent on the health and vitality of American technology companies, and will benefit to some degree if any or all of these recommendations were implemented. However, the degree to which they benefit is being attenuated by the fact that American technology companies are rebalancing their workforces. If the problem is affecting workers, then shouldn't we be thinking about policies that are worker-centric?

5.4 What's in a Label? Politics, Ideology and Nothing of Much Practical Use – Or Good Solutions That Never See the Light of Day

There are other elements that have impeded progress in the policy discourse. For example, potential policy responses are often grouped in the vague artificial categories of either "free-trade" or "protectionism". The political culture construes protectionism negatively, and as a result, many potential policy responses have been slowed or stopped because they have been tagged as *protectionist*. Industry groups with an interest in accelerating the movement of work offshore have targeted any policy proposal they don't like and labeled it protectionist. Some of these ideas include government procurement policies and better enforcement of guest-worker visas regulations.

Remember that many of these same industry groups favored the "protectionist" relief in the 1980's when their firms were under assault. I'm not just talking about steel and autos, but instead semiconductors. There were voluntary quotas instituted, major subsidies with the formation of Sematech, etc. It is interesting how some are able to suspend their orthodoxy to pragmatically help companies under the rubric of the economy or national security but not even consider options that might help workers?

5.5 The Techno-Optimist Solution – Be Patient for the Next Big Thing
The other answer proposed is to just wait for the "next big thing." The U.S. will be able to move 'up the ladder of innovation.'

The techno-optimists say that it will be biotechnology or bioinformatics or nanotechnology. In fact our own National Science Foundation, a bastion of techno-optimism, has predicted that there will more than 2 million jobs will be created in nanotechnology. I certainly hope that this comes true. We can only speculate on the impact that nanotechnology will have on the economy and jobs, and hope that it will be significant as some predict, and considering the current employment situation that it happens soon. However, we should not be complacent and believe that no countries will be able to leapfrog that ladder of innovation. As a nation, we are not alone in our pursuit of the frontiers of nanotechnology. China is currently the second largest producer of technical papers in nanoscience and nanotechnology, even ahead of Japan. With great cost advantages in addition to this advanced technical knowledge, we should anticipate that China will compete strongly for new nanotechnology jobs and manufacturing opportunities.

5.6 U.S. Government Policies that Accelerate & Encourage Offshore Outsourcing – Solutions That Hurt

Let me preface this section by saying that I believe that the H-1B and L-1 visas have been important policy tools that have improved America's technological prowess. As someone who has worked most of his career in research labs and universities, I can attest to this firsthand. They should not be eliminated, but reformed.

My own research, forthcoming in the journal *Technological Forecasting & Social Change*, has shown that a number of offshore outsourcing firms have stretched the guest-worker visa regulations (H-1B and L-1) to gain competitive advantage in the U.S. market. This process of exploiting the lax visa regulations has actually *accelerated* the process of offshoring and offshore outsourcing. Many of the offshore outsourcing and offshoring business models rely very heavily on H-1Bs and L-1s. It is long overdue for Congress to align the law and enforcement to its and the American people's intent on guest-worker visas. The visas should be used as a last resort, not a first choice for cheap labor. With current IT and engineering unemployment rates, it is unfathomable that industry is likely to use up its quota of H-1Bs for FY 2004.

It is difficult enough for American technology workers to compete with low cost labor from halfway around the world; it is unreasonable to expect them to compete with low cost guest-workers here because of visa regulation loopholes. Certain types of work, because of its nature, must be done in the U.S., and it is reasonable to expect that this work should be done by American workers. Instead we have a guest-worker policy that displaces American workers in favor of foreigners for work that cannot be done overseas.

The current H-1B and L-1 system is tantamount to dumping, defined by the U.S. International Trade Commission as, "the sale or likely sale of goods at less than fair

value." In this case, companies are bringing in labor from abroad and selling it at below fair value. There is no way that competitors could hire equivalent U.S. workers at that cost. For example, EDS proposed, in its FY 2001 Labor Condition Applications, to pay its 452 H-1B's a median salary of $71,251, while Wipro proposed salaries of $50,648 for 3,120 H-1B's and Tata $36,502 for 11,982 H-1Bs. See my paper with the handouts for more details.

Many of these H-1B dependent companies are also on the GSA Federal Supply Schedule. So, not only are they bringing in cheaper foreign workers, but also winning some of Uncle Sam's business with them. These are substantial businesses with some of the largest market capitalizations in the world and gross and net profit margins that are significantly higher than their U.S. rivals.

Guest worker visas are critical to many of the offshore outsourcers' business models, which is clear from NASSCOM's (the Indian S/W Services Association) lobbying efforts – direct and indirect through ITAA. In fact the Prime Minister of India's recent comments at an EU summit echo NASSCOM's efforts. He warned that the U.S. would be foolish not to raise the H-1B cap because otherwise more work will move offshore. Here is an excerpt from the San Jose Mercury News article dated November 29th.
> "Prime Minister Atal Bihari Vajpayee attributed the recent surge in outsourcing to visa restrictions blocking the movement of skilled workers to rich countries.
> …Both the United States and some European countries have instead tightened visa regulations.
> `In the absence of a liberal regime, outsourcing is inevitable,' Vajpayee said."

Why would the PM of India be making an argument that on the face of it would favor the U.S. over his own country? The more work that moves offshore the more that India has to gain. In fact profit margins on work done overseas is greater than work done with H-1B and L-1 visa holders. These companies are offshoring as much as they can. Why would the PM of India be so concerned with the U.S. economy? It seems that this is one India's strategies because they believe it sounds convincing. Another indicator of how important the visas are to Indian IT firms is revealed in the public financial statements of many of these companies, who list potential tightening of U.S. immigration regulations as a major source of risk.

For some, the free movement of people is an ideological mission (the Cato Institute comes to mind), but if its implications were explained to the average American it is likely that he or she would be taken aback. The free movement of people is covered by trade agreements under the World Trade Organization's General Agreement on Trade in Services (GATS). The U.S. already has specific commitments in GATS from the Uruguay round that cover the H-1B and L-1 visas.

The trade policy process is the most opaque and undemocratic U.S. government process that I have personally encountered, and I teach public policy. I philosophically favor free trade and understand that it requires tough choices and that there will be losers from those choices. But the current process by which the U.S. Trade Representative (USTR) receives input needs some serious overhaul. A narrow set of special business interests seems to carry disproportionate weight in helping the USTR shape negotiations. One just needs to

review the Senate debates about immigration policy being made unilaterally by the USTR in the Singapore and Chile Free Trade Agreements. So, yes, the WTO disturbs me, not because I went to Cancun to protest, but because it is philosopher king rule by vested interests, and democracy seems to be a better form of governance.

6. How to Move Forward

The economic and employment challenges we will face because of offshore outsourcing are complex. There are no easy answers or silver bullets in terms of public policy recommendations. However, there are some practical and immediate steps that we can take.

So, what do we do?

1. The federal government (read Departments of Labor and Commerce) must begin regularly tracking the volume and nature of the jobs that are moving offshore. The lack of objective data creates too many opportunities for dueling studies. With the data, we can make some progress in trying to solve problems instead of expending more effort on debating whether it is a problem or not. It was good to read Commerce Undersecretary Cooper's remarks at the press conference earlier this week at the unveiling of *Digital Economy 2003* about an initiative to begin counting offshoring and offshore outsourcing trends.

2. Congress should strengthen H-1B and L-1 workforce protections and their enforcement to ensure that the programs serve their respective purposes without adversely affecting employment opportunities for U.S. high-tech workers. There are bills pending in Congress that would reform the L-1 and H-1B visa rules. The Dodd/Johnson bill seems to be the most sensible, and it should be passed.

3. Companies should be required to give adequate notice of their intentions to move work offshore so that the displaced employees can make appropriate plans to minimize the financial hardship, and government support agencies can prepare to provide the necessary transition assistance. It is obvious that companies are concerned about revealing their true plans of moving work offshore and will not voluntarily reveal this information.

4. 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. This recommendation will require extensive experimentation and resources.

5. Fundamental 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.

6. Congress should take affirmative steps to ensure that the U.S. retains the domestic human resource and production capabilities needed to develop and utilize technologies deemed critical to U.S. national and homeland security.

7. As globalization narrows U.S. technology leadership, the Department of Defense and other government security agencies will need to enhance their ability to acquire and assimilate foreign technologies.
8. The U.S. needs a coordinated national strategy designed 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.

I have dubbed the dialogue on offshore outsourcing as the *New Competitiveness Debate* because I think there are many lessons to be learned from the manufacturing competitiveness debate of the 1980s. The most important one is that it takes time and creativity to generated policy responses. There were many significant policy changes that improved the competitive position of the U.S. including the creation of the Technology Administration. Many of the ideas came from the state and local levels, what policy academics often call the "laboratories of innovation."

The key difference between the New Competitiveness Debate and the one in the 1980's is that workers are being adversely affected *rather* than companies. That changes the feasible region and constraints on potential practical and political solutions, and I would suspect makes it much more difficult to move forward.

However, I am an optimist and I really do believe in the value and arguments in favor of free trade. I believe that offshoring can be a key to revolutionize the economies of many developing countries that have heretofore been stagnant. As someone with close family still in developing countries, in India in particular, I have personal interest in witnessing the revolution of tapping the incredible amount of idle human capital and knowledge in these countries. I see enormous possibilities to help bring many more people into the modern world. As an engineer, I am comfortable with and completely agree with the need to cut costs through automation. I think that most engineers would agree with this outlook. My sense is that most did *not* get into this profession because they wanted make-work or the government to preserve their jobs.

It is equally important for offshoring advocates to figure out how to *ensure* (not just assume) that we do not have a great deal of idle human capital in the U.S. It is not sufficient to call it 'painful' and hope for rosy redeployment scenarios. Offshoring advocates should have an obligation, because it is within our country's own self-interest, to make sure that those who are displaced through no fault of their own have the means to transition into productive positions.

We should set aside the labels and begin to work constructively together to address the real losses, human, economic and innovative that America will experience from offshore outsourcing. If we can pull this off in an ethical and reasonable way, it will do far more to bolster arguments in favor of free trade than any study or economic equations would hope to demonstrate and make offshoring an actual rather than hoped for 'Win-Win'. This is the challenge before policymakers and business leaders.