

IT Offshoring: Economic and Policy Analysis

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Table of Contents

Abstract.....3

Introduction.....4

1. Economic Considerations for Offshoring (Author: Aamir Alavi).....4

 1.1 Comparative Advantage.....5

 1.2 Cost-Saving.....5

 1.3 Labor Market Implication.....6

2. Non-Economic Factors In Offshoring (Author: Brad Struss).....8

 2.1 Offshoring Factors.....9

 2.2 Risks Associated With Offshoring.....12

3. US Public Policy To Manage Offshoring (Author: Jeongsoo Kim).....13

 3.1 Policy Input: Dynamics of Stakeholders.....13

 3.2 Policy Output: Legislations and Regulations on Offshoring.....17

 3.3 Current Public Policy Issues.....18

4. Interest, Education, and Competitive Advantage in the US IT Industry (Author: Mandy Chang).....22

 4.1 IT Education Trends.....23

 4.2 Factors of Deterrence.....23

 4.3 Recession Not the Sole Culprit.....24

 4.4 Management As A Partial Solution, And Education Curriculum Implications.....26

 4.5 Innovation As A Complementary Remedy.....27

 4.6 Getting The Right Combination.....28

Conclusion.....29

Bibliography.....30

Abstract

(Author: All)

In this brief we investigate the causes and effects of recent increased IT outsourcing to lower-waged countries. In the first section, we examine the economic considerations to outsourcing IT work abroad. The economic considerations include a cost/benefit analysis of the impact that outsourcing has on an individual firm and on the US market as a whole. This section provides insight into the economic incentives to outsource or not. Delving into the economics of outsourcing has important implications for policy because policy can alter decision making of whether to outsource or not by changing incentives.

We then analyze the non-economic issues involved in outsourcing. These include looking at the risks and benefits associated with project quality, public relations, employee morale, and time to market.

We then examine the politics of offshoring and issues in public policies that can affect the US IT industry. Although offshoring is still small relative to the total U.S. job market, it is likely to increase in the future. Thus analyzing IT offshoring across geographic and temporal boundaries, its short and long-term consequences, nationally and internationally is required. With careful consideration of all stakeholders mentioned here, and with thorough analysis of the strategies, outsourcing can be a “win-win” situation for all.

Finally, we narrow our focus to specifically address the educational curriculum in the United States, along with recent trends of views on the IT industry in the US. Through recent trend analysis we will provide an explanation for why outsourcing is a growing phenomenon.

Introduction

(Author: All)

The term “offshoring” refers to the relocation of jobs and production to a foreign country. The relocated jobs and production could be at a foreign office of the same multinational company or at a separate company located abroad. In contrast, the term “outsourcing” does not necessarily imply that jobs and production are relocated to another country.

There are a wide range of functions that have the potential for offshoring. This can include back office, customer contact, common corporate functions, and customer support. The criteria for generally more successful functions in offshoring are those that can be digitized or handled by telephone and ones where appropriate skills are available or easily developed at the offshoring vendor. Thus, less complicated functions were the first to be outsourced. This includes back office work where less skilled work such as basic data entry is performed.

With the high demand for IT professionals to make software changes in preparation for Y2K, corporate IT departments began to offshore at an accelerated pace. Beyond Y2K fixes, companies initially looked to outsource system maintenance, quality assurance, and application migration. Over time, even some higher-value works such as application development has been offshored. The most skill-demanding work, however, has yet to play a large role in outsourcing. This includes decision analysis and research or development.

1. Economic Considerations for Offshoring

(Author: Aamir Alavi)

According to the Outsourcing Institute and Dun & Bradstreet study, in 2000 IT headed the list of outsourced functions with 28% of the share of outsourced functions. Further, according to the same study, the U.S. market for outsourcing was \$100 billion in

1996 and it more than tripled to a market size of \$345 billion in 2000.¹ These facts lead to a great question. Why has outsourcing in the IT industry faced such explosive growth? Studying the reasons that outsourcing in the IT industry has grown so fast is essential because this trend is redefining the way that business is done. In this section, we will explore some of the more prominent economic issues surrounding the decision to outsource in the IT industry.

1.1 Comparative Advantage

Proponents of offshoring state that offshoring allows companies to take advantage of competitive advantages in the production of goods or provision of services. Economic theory suggests that exploiting comparative advantages makes firms more efficient and productive by focusing their energy on producing what they are best at while trading for goods or services from other firms that produce other goods relatively better than the first firm can. This specialization allows both firms to produce more of their specialty while trading for the goods that they did not produce. An important implication to this is that more of each good can be produced for cheaper, saving people valuable resources to invest in other areas.

1.2 Cost-Savings

A McKinsey&Company study shows that offshoring drives significant performance improvement. The study shows that **by offshoring, US companies save 65-70% of each dollar that they would have spent in production of the good or service at home.** After an initial increase in costs due to additional telecom and management, there is a large factor cost savings and reengineering savings.

Taking a look at the India offshore industry case from McKinsey&Company (MGI) offers further insight into the cost-savings that offshoring IT offers. India, which holds the second largest offshored services market (with \$7.7 billion of the market, second to Ireland with \$8.3 billion) captured \$0.33 from each dollar spent in offshore outsourcing by the US in 2002. \$0.10 of the dollar goes to labor, \$0.10 in profits is retained in India, \$0.09 revenue accrued to the supplier industries, and another \$0.04 goes

¹ Howard M. Lackow. 2001 "IT Outsourcing Trends," *The Conference Board*

to the central and state governments. The other \$0.66 spent breaks down as savings accrued to U.S. investors and/or customers (\$0.58), import of U.S. goods and services by providers in India (\$0.05), and transfer of profits by U.S. providers in low-wage country to parent (\$0.04). Thus:

- Americans capture \$0.58 of savings for each dollar they offshore.² These studies show that by outsourcing, the U.S. firm exploits the comparative advantage that overseas firms have in an aspect of production of their good.
- The overseas firm is able to produce the good at a much lower cost, allowing the U.S. companies the ability to shift resources to other higher value productive capacities.

A decade ago, U.S. companies began shifting much of their weight into IT services as much of the manufacturing has already been outsourced abroad. However, as IT services are also being offered abroad at lower cost and high quality, U.S. companies have been shifting their weight once again towards tailored services that require close interaction with customers.³ It appears as if U.S. companies are slowly losing their competitive advantages in the IT industry and finding fewer services to provide customers.

1.3 Labor Market Implications

A large fear associated with offshoring is that jobs at home are lost when production is outsourced to lower income countries. **In the short-run, jobs are frequently lost.** Studies by MGI estimate that about 11% of jobs in the economy, about 14.1 million jobs, are “at risk” to be offshored. The other 89%, or 113.8 million jobs, are in service industries such as retailing, catering, and personal care. This work, by its nature, cannot be moved abroad.⁴ In 2003, the number of jobs that were being offshored was 345,000, over triple the amount of outsourced jobs since 2000.⁵ IT jobs consist of almost of a third of these “at risk” jobs, which leaves over 4.5 million jobs at risk. Further, as functions outsourced moves from mechanization to more skilled labor, more

² McKinsey & Company Institute presentation on offshoring
<http://www.mckinsey.com/knowledge/mgi/rp/offshoring/>

³ “A Survey of Outsourcing”, *The Economist*, Nov. 13th 2004

⁴ Bardhan and Kroll, “The New Wave of Outsourcing,” Fall 2003, University of California at Berkeley

⁵ Howard M. Lackow. 2001 “IT Outsourcing Trends,” *The Conference Board*

and more white collar workers are being laid off from their companies as their jobs are shipped overseas.

IT offshoring causes wage deflation for US workers competing with offshore labor. As the market for labor is globalized, the supply of labor is expanded greatly. As more competitors enter into the labor market, wages will be driven down. For those jobs that can easily be offshored at a lower cost while ensuring good quality work, US wages likely decrease given that demand is constant. On the other hand, IT jobs that require more tailored skills that are not easily offshored, do not face such wage deflation.

However, proponents of outsourcing show that **in the long-run new jobs are created in new higher value services.** Because machines and foreign workers can perform the same work more cheaply, the cost of production falls. That means higher profits and lower prices, lifting demand for new goods and services. Looking back to the India example stated above, MGI estimates based on an analysis of historical U.S. reemployment trends that there is a \$0.45-\$0.47 added value per dollar offshored due to reemployment of U.S. labor in other productive capacities.

Thus, this study suggests that not only does offshoring reduce costs, but also one dollar previously spent in the U.S. creates a potential added value through **reinvestment of savings in higher value productive functions for employees to participate in.** As evidence of growing job functions at home, offshoring in manufacturing has been accompanied by growth in services. For the 20 year period from 1983-2003, an average of 3.4 million net new service jobs have been created per year as compared to a total of 2 million jobs lost to outsourcing throughout the entire 20 year period.⁶ Yet again, there is uncertainty about jobs of the future because in the long run, most of them will involve producing goods and services that have not yet been invented.

Now that we have examined some of the major economic issues associated with outsourcing in the IT industry, we shift our attention to non-economic factors that affect the incentives to outsource.

⁶ Forrester Research, "33 million U.S. service jobs to go offshore," November 2002. Bureau of Labor Statistics

2. Non-Economic Factors In Offshoring

(Author: Brad Struss)

In today's marketplace, proponents claim that there are many reasons why offshoring can give a company a competitive advantage. As detailed in the previous section, the primary driver is often economics. According to the Computerworld/InterUnity Group Survey, 44% of those surveyed cited cost reduction as the top reason for offshoring.⁷ While the potential economic benefits of offshoring are often the first reason corporations look to offshore, there are a variety of additional reasons they consider. When offshoring, companies must weight the potential benefits gained against the potential downsides that can be associated with a company offshoring.

What industry changes have enabled corporations to consider offshoring for their IT projects? The primary factors that have enabled this are (1) a highly trained international workforce, (2) improvements in telecommunications and related technology that better support disparate software development, and (3) the move within corporations to modular software development.

Companies that outsource solely to gain an economic advantage may put themselves in a risky position. While today the economics of offshoring appear good from a corporate perspective, there are also signs that the economic benefits may diminish over time. One early sign has been the high rate of turnover at many Indian outsourcing firms due to job switching between companies. This has been caused by the strong demand for skilled workers in India. At several major Indian outsourcing firms, competition for talented engineers has caused wages to increase by 15-17% per year.⁸ Furthermore, Gartner analyst Partha Iyengar predicts that demand for Indian IT outsourcing will exceed supply in five years.⁹ While the economic benefits may still be there in the future, given these trends, corporations are also looking to ensure they are finding benefits with outsourcing beyond cost savings.

⁷ King, Julie. "IT's Global Itinerary." Computerworld, September 15, 2003.

⁸ "A Survey of Outsourcing." The Economist, November 13, 2004. Page 13.

⁹ King, Julie. "IT's Global Itinerary." Computerworld, September 15, 2003.

2.1 Offshoring Factors

There are many factors beyond economics that companies must consider when making an outsourcing decision. These factors can be potential benefits for the company, but there are also associated risks with outsourcing. The major benefits¹⁰ that proponents say can be gained from offshoring include:

- Improved IT project quality
- Tackling new types of projects
- Flexibility in finding skilled workers
- Managing headcount efficiently
- Efficiencies from increased competition

The following sections analyze these benefits.

Improved IT project quality. Project quality is the double edged sword of offshoring. While many corporations see improved project quality, there are also many companies that do not see these gains.

Project quality can be improved in offshored projects because:

- International outsource vendors are often able to hire more highly qualified employees for a lower rate that U.S.-based corporations can.
- The lower operating costs at the offshore vendor allow for additional money to be spent on training and oversight.
- Offshore vendor employees may be more motivated because their jobs are high-end in their country, but often considered lower end in the US.
- Many offshore vendors have excellent ratings in their processes for software development. These ratings are often significantly higher than those of the

¹⁰ This list is a consolidation of survey's of IT professionals found in (1) King, Julie. "IT's Global Itinerary." Computerworld, September 15, 2003, and (2) Poole, William, and Rao, Madhu. "Global Information Technology Sourcing: Impacts and Implications for Washington State." RATEC and Seattle Chapter of the Society for Information Management, July 2004.

corporate IT departments they are working with. For example, according to MIS Quarterly, “the best known quality yardstick is the Capability Maturity Model, and a number of Indian IT firms have attained world-class levels of quality by implementing CMM processes.”¹¹ Major Indian offshore companies such as Wipro have also embraced the Six-sigma process quality focus.¹²

The main reasons why project quality may not improve are:

- Problems with the contract itself. Often times the issue is that the “contract doesn’t reflect business objectives”¹³ or that requirements are not stated specifically enough. Furthermore, it is critically important to a good contract that key people from each organization impacted (IT, end users, legal, etc.) are involved in the contract discussions.
- High rates of turnover or shuffling between projects at the offshore vendor. This can lead to constantly needing to bring new team members up to speed. To avoid this it is recommended that the contract provide the ability to limit team members moving between projects and to give companies the ability to interview and approve new team members.¹⁴

Tackling new types of projects. While economically related, IT outsourcing can provide companies the ability to tackle significant projects that would not have been possible prior to outsourcing due to cost, internal skill, or time to market considerations. For example, outsourcing has allowed companies to expand operations by providing more customer support for the same or less money. This increased customer support can result in better customer satisfaction.¹⁵

¹¹ Carmel, Erran, and Agarwal. Ritu. “The Maturation of Offshore Sourcing of Information Technology Work.” MIS Quarterly Executive Vol 1. No. 2, June 2002.

¹² “A Survey of Outsourcing.” The Economist, November 13, 2004.

¹³ Brandel, Mary. “Sinking Quality.” Computerworld, November 15, 2004.

¹⁴ Brandel, Mary. “Sinking Quality.” Computerworld, November 15, 2004.

¹⁵ Agrawal, Vivek, Farrell, Diana, and Remes, Jaana K. “Offshoring and beyond.” The McKinsey Quarterly, 2003 Special Edition: Global directions.

Flexibility in finding skilled workers. Offshoring can help solve the challenge of finding experienced workers in key technology areas by provide expertise that is not available inside of the corporation's IT department. Given how quickly technology is changing and evolving, corporate IT staffs are often unable to stay abreast of new developments, let alone be proficient in them. Moving projects to a qualified offshoring company can provide this knowledge much faster than would be possible by hiring or training staff in their internal IT departments.

Managing headcount efficiently in response to sways in IT demands. Corporate IT departments often go through cycles of demand for their services. This can create cycles of hiring and firing as they work to meet the ups and downs of the demand. Utilizing offshore vendors for rapid ramp up of their work force to handle peak demand can allow companies to avoid over hiring during cyclical business upswings. This in turn allows the company to avoid layoffs when business levels drop off.

Efficiencies from increased competition. Increased competition is big driver in reducing costs and improving IT efficiency. This is both between offshoring vendors and between vendors and a corporation's internal IT department. Firms have found that including their internal IT departments in the competition for projects has had many benefits. One benefit is that it provides insight into what needs to be included in a contract with offshore vendors, if the decision goes that way. It also provides the incentive for IT departments to be more efficient and creative in their planning and implementation, or as MIS Quarterly says, it puts "market pressure on internal IT units."¹⁶

Allowing US-based IT staff to focus on strategic projects. Many corporations begin by offshoring more mundane tasks. These tasks include quality assurance, porting, or product upgrades. This can benefit internal IT staff by freeing them from these mundane IT tasks and providing them the opportunity to work on more strategic projects.

¹⁶ Carmel, Erran, and Agarwal. Ritu. "The Maturation of Offshore Sourcing of Information Technology Work." MIS Quarterly Executive Vol 1. No. 2, June 2002.

2.2 Risks Associated With Offshoring

Moving projects to an outsource vendor is not without risks. The major risks for corporations to be aware of include:

- Impact on internal employees. This can include lower morale caused by concern about potential job loss or as one IT executive said he worries about the “unease it created among domestic employees.”¹⁷ This can be more perception driven than based upon reality. In a survey of ten major Washington corporations, only one layoff was tied to offshoring¹⁸. In fact, a Government Accountability Office report states domestic relocations are twice as likely to cause layoffs as offshore relocations¹⁹. To help employees overcome their concerns it is important that corporations have “clear policies regarding the impact that offshore resources are likely to have on employees”²⁰ and to involve IT employees in offshoring decisions.
- Public relations issues in community. Since outsourcing is a hot topic in the press today, it’s important that companies proactively manage communication with the press on their offshoring decisions.
- Lacking the right skills to manage external project. To be successful, outsourcing needs good internal oversight by employees with experience managing outside vendors including contract management, service delivery experience, and international experience.²¹
- Loss of IT core competencies. One danger of offshoring is the potential loss of internal capabilities in key technology and business process areas which can cause a company to be become dependant on an outside supplier. To avoid

¹⁷ Poole, William, and Rao, Madhu. “Global Information Technology Sourcing: Impacts and Implications for Washington State.” RATEC and Seattle Chapter of the Society for Information Management, July 2004.

¹⁸ Poole, William, and Rao, Madhu. “Global Information Technology Sourcing: Impacts and Implications for Washington State.” RATEC and Seattle Chapter of the Society for Information Management, July 2004.

¹⁹ United States Government Accountability Office, “International Trade: Current Government Data Provide Limited Insight into Offshoring of Services,” Report of Congressional Requesters, September 2004, p. 34.

²⁰ Carmel, Erran, and Agarwal. Ritu. “The Maturation of Offshore Sourcing of Information Technology Work.” MIS Quarterly Executive Vol 1. No. 2, June 2002.

²¹ Hoffman, Thomas. “Talent Drain.” Computerworld, November 15, 2004.

this it is critical companies retain the IT staff involved in critical projects and keep them up to speed on work being done at offshore vendors.

- Loss of IT training ground. With entry level jobs moved offshore, companies can be faced with lack of projects to allow new employees to gain experience. It is important for companies to develop policies that support continued training and education for less experienced employees.
- Project quality. As discussed above, project quality can suffer if project diligence is not followed.

3. U.S. Public Policy To Manage Outsourcing

(Author: Jeongsoo Kim)

The debate on offshoring calls for the attention of politicians, economists, legislators, corporate executives and workforces. We analyzed the factors and impacts of offshoring in terms of economic and non-economic considerations. Now we will turn our focus on policy: First, we will discuss the public policy input: Who is involved? What is their perspective? How do they interact? Second, we will examine the policy output; the current legislations, regulations and policies. Finally, we will analyze central policy issues that U.S. public policymakers have to deal with.

3. 1 Policy Input: Dynamics of Stakeholders

A diverse set of relevant stakeholders are involved in offshoring. Broadly speaking, there are two main actors in offshoring: offshoring countries and offshored, namely host, countries. The key stakeholders in each side are summarized in the table below.

OFFSHORING NATIONS	HOST NATIONS
Professional service workers losing jobs	Professional service workers being hired
Firms hiring foreign labor	Firms providing outsourcing service
Legislators responsible for economy	Policymakers responsible for economy
Regulators	Citizens not being hired for professional services
Government procurement	
Customers of professional services	

Source: Global Outsourcing of Professional Service. 200

The relationships among the key stakeholders are complicated. On one side of offshoring nations, there are displaced workers, who want to retain professional jobs within the U.S., and the interest groups they form strongly oppose offshoring. On the other side corporations pursue significant cost savings through an increase in offshoring.

The legislators who deal with the impact of offshoring on labor and the economy have to take into account short-term solutions. However, the solutions suggested so far such as better education, better infrastructure, and better intellectual property protection are long-term solutions which are irrelevant in the short-run in terms of their ability to resolve the issues faced by these stakeholders.²²

This research focuses on the offshoring nations, specifically the U.S., and examines views on offshoring from the perspective of each stakeholder.

Perspective of Political Actors

Offshoring, along with the sluggish U.S. economy, was one of the central issues during the presidential election of 2004. N. Gregory Mankiw, chairman of Bush's Council of Economics Advisors, said that offshoring was probably a plus for the economy in the long run. According to Mankiw, outsourcing (offshoring) is a natural part of the economic process and may be a good thing. Accordingly, the Bush administration supported offshoring under free trade.

Democrats used the outsourcing issue as a political lever in the 2004 presidential election and the sudden attention to outsourcing actually gave them a fulcrum. Democrats said taxpayers' money should not be used to send jobs overseas and heavily criticized N. Gregory Mankiw for suggesting that offshoring could help the U.S. economy. Mr. Kerry highlighted his plan to change American tax code and trade policies to encourage corporations to create jobs and keep them in the U.S.²³

The U.S. senate has backed a measure to restrict the exporting of jobs to developing countries such as India and many of the pending bills seek to curb offshoring. Baucus is one of several lawmakers, most of them Democrats, who have proposed

²² Seshasai, Satwik. 2004. Global Outsourcing of Professional Services. MIT Sloan School of Management Working Paper 4456-04

²³ Wenzel, Fritz. "Punish Job Exporters," *Tribune Business News*. February 29, 2004

legislation specifically aimed at offshoring. Some of these bills seek to collect more statistics on companies that hire out work to other countries, or to shame companies into thinking twice by requiring them to publicly report their outsourcing plans. Other bills would cut off federal contracts and loans to companies who create jobs overseas while eliminating them in the U.S.

While Republicans and Democrats have opposite perspectives regarding offshoring and related policies such as tax policy and trade policy, they have agreed that the U.S. has to make an effort to improve the education system, especially for math and science skills, to make the American workforce more competitive.

Perspective of Economists

Long-term view

According to economic theory, the cost savings and use of offshore resources “lower inflation, increase productivity, and lower interest rates. This boosts business and consumer spending and increases economic activity.”²⁴ Likewise, economic theory suggests that international trade will not reduce U.S. output or employment over the long run, and, in fact, such trade will likely have positive long-run effects. Exchange rate adjustments and newly-produced export opportunities for U.S. companies are expected to keep the economy operating at its long-run potential output.

Short-term view

Economists see that although service-sector offshoring will not reduce U.S. employment over the long run, a faster pace of offshoring may have short-run employment effects. Jobs losses due to offshoring are likely to be permanent in the sense that the workers will not be recalled to a similar position with that company. Workers whose jobs have been permanently lost are more likely to move to another state or switch occupations to find new employment. As a result, they may be unemployed longer than the average job loser, and they may experience greater long-term income losses.²⁵

²⁴ Hines, Matt. 2004. “Greenspan: Offshoring+laws+could+harm+US,” *CNET News*, March 12.
http://news.com.com/Greenspan+Offshoring+laws+could+harm+U.S./2100-1022_3-5172975.html

²⁵ Hall, Robert E. 1979. “A Theory of the Natural Unemployment Rate and the Duration of Employment,” *Journal of Monetary Economics*, April.

Perspective of Other Key Stakeholders

From producers and consumers point of view, moving jobs to minimize production costs means some combination of higher profits, lower prices, and improved economic conditions around the world. Financial institutions and service providers subsequently found offshoring to be a source of competitive advantage for their businesses. Business executives are increasingly convinced that offshoring of professional services can provide their companies with major cost benefits by allowing goods and services to be produced at the most economic prices without traditional barriers of national boundaries and corporate boundaries.

On the other side, trade union and unemployed individuals blame many economic woes to offshoring. From the perspective of the workers displaced and the families forced to downsize their expectations, the losses are much more personal and difficult to justify on the basis of the potential overall economic gains.

Perspective of Academics

A number of studies have been done by different research institutes, government agency, academies, consulting firms, and think-tanks in Washington DC. While their perspectives are diverse in accordance with their positions, such as conservative, liberal and bi-partisan, there has been consensus that they are faced with limited data.

According to the GAO, U.S. government data provides some insight into offshoring trends, but they are not accurate enough to analyze the full impact of offshoring.²⁶ The GAO report also states that federal employment data provides limited information about offshoring's impact on the workforce. Improving the data collection is one of policy agendas frequently discussed in academics. The Bureau of Labor Statistics has been asked to conduct the survey on a regular basis to better measure the extent of services work moving offshore and the changes in domestic employment, wages, and productivity that result. This will allow policy makers to make a decision based on more complete data.

²⁶ GAO, International Trade: Current Government Data Provide Limited Insight into Offshoring of Service. Report to Congressional Requesters. GAO-04-932.

3. 2 Policy Output: Legislations and Regulations on Offshoring

Bills on Offshoring

So far this year, eight states have taken up legislation aimed at preventing companies from offshoring, according to the National Conference of State Legislatures.²⁷ For example, the United States Workers Protection Act aims to ban offshoring in three areas of government work: privatization of federal work; federal purchase of goods and services; and state government procurements using federal funds.²⁸

Maryland, New Jersey, and several other states have pending bills that would prevent the offshoring of government IT jobs abroad. Other pending bills would require call center employees to identify themselves by their real name and the location they are based in (thereby discouraging offshoring of technical support and other types of customer support). In Michigan, one pending bill seeks to seize away state contracts from firms that hire foreign employees.²⁹

Bills have also been proposed over the past few years at the federal and state levels to reduce the quota of H1-B and L1 visas. This is designed to negatively impact companies who replace American jobs with offshore workers.³⁰

Bills on Privacy

Privacy concerns related to offshoring resulted in Congressional action as well.³¹ The Personal Data Offshoring Protection Act of 2004 (HR 4366) was introduced in the House of Representatives on May this year and it would prohibit the transfer of information identifying U.S. citizens to anyone outside the United States without the citizens being notified first.³² According to the legislation, within six months of the date

²⁷ Schneider, Greg. 2004. "Anxious About Outsourcing," *Washington Post*, January 31.

²⁸ Hines, Matt. 2004. "Greenspan: Offshoring laws could harm US," *CNET News*, March 12.

http://news.com.com/Greenspan+Offshoring+laws+could+harm+U.S./2100-1022_3-5172975.html

²⁹ Arora, Vasantha. "Proposed Michigan bill to ban outsourcing contracts." *Hindustan Times*, August 12, 2003.

³⁰ Nanda, Tanmaya K. "Bills galore to check outsourcing." *India Abroad*. September 12, 2003.

³¹ A few Indian and Pakistani workers last year threatened to post on the Internet medical records of U.S. citizens they had transcribed for U.S.-based organizations unless their demands for payment were met, according to news reports. (Psychiatric news, June 18, 2004, Volume 39 number 12.

³² Personally identifiable information covered by the new bill includes medical records, financial information, Social Security numbers, names, and addresses. House Bill, 108th Congress 2nd Session, H.R. 4366. <http://thomas.loc.gov>.

the bill is enacted, the Federal Trade Commission would develop regulations to certify countries with legal systems that adequately protect personally identifiable information.³³

The bills related to offshoring from the 108th Congress are summarized in the table below. Most of bills in the table seek to ban offshoring or to protect personal information of U.S. citizens.

Bills Related to Offshoring From The 108th Congress
Keeping American Jobs at Home Act (S.2531)
Increasing Notice of Foreign Outsourcing Act (S.2481)
Outsourcing Information Act (S.2926)
Consumer Privacy Protection Act of 2003 (H.R. 1636)
Manufacturing Technology Competitiveness Act of 2003 (H.R. 3598)
National Space Commission Act (S.1821)
Truthfulness, Responsibility, and Accountability in Contracting Act of 2003 (H.R. 3426)
Department of Defense Appropriation Act, 2004 (H.R. 2658)
National Defense Authorization Act for Fiscal Year 2005 (H.R. 4200)
Department of the Interior and Related Agencies Appropriation Act, 2005 (H.R. 4568)
Transport, Treasury, and Independent Agencies Appropriations Act, 2004 (H.R. 2989)
Personal Data Offshoring Protection Act of 2004 (H.R. 4366)
Jobs for America Act of 2004 (H.R. 4740), (S.2090)

3. 3 Current Public Policy Issues

Trade Policy

As service sector offshoring has increased, policymakers have come under increased pressure to restrict service imports. Offshoring proponents support policies that encourage free trade, free labor, and free capital while offshoring critics support protectionist policies. One of active opponent of offshoring, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), argued that trade agreements must be reformed to include enforceable protections.³⁴ In the same context, a provision in

³⁴ Bal Harbour. 2004. "Outsourcing America,"
<http://www.aflcio.org/aboutaflcio/ecouncil/ec03112004i.cfm>

a spending bill signed in early 2004 prohibited the federal government from awarding certain contracts to private companies that would perform the work overseas.³⁵

On the other hand, economic research found this protectionism is a costly way to preserve U.S. jobs. For example, the state of New Jersey required a computer-service contractor to relocate an 11-employee help center to Camden from Bombay at an extra cost to the state of nearly \$1 million.³⁶ As another example, Francois, Arce, Reiner, and Flynn estimates that protection of U.S. coastal shipping has cost Americans between \$200,000 and \$387,000 annually in reduced national income per job protected.³⁷

Both supporters and critics of offshoring agree that fair trade in international trade policy is key. According to both views, while the gains from free trade are clearly (or vaguely) true, the issue of fair trade must be considered. While the U.S. has relative openness to service trade it has to deal with high barriers to entry into other countries' service market. India is one such country with these barriers.

Education and Job Creation

Craig Barrett, the chief executive of Intel, has been quoted as saying that the shortage of skilled engineering graduates in the U.S is more likely to drive jobs abroad. Many proponents of offshoring, particularly from the corporate executive viewpoint, suggest skill mismatch is one of the main factors for offshoring. Federal Reserve chairman, Alan Greenspan agreed on that and among the recommendations Mr. Greenspan made for improving the American job market was to increase emphasis on math and science among school children and to offer more retraining programs for career changes.³⁸

It has been underscored in every field that the U.S. government must improve the U.S. education system to create and maintain a highly skilled workforce. This will strengthen U.S. competitiveness in a global economy and help create jobs in the future. Strategies that are discussed include: improving K-12 education; making science, math,

³⁵ Schneider, Greg. 2004. "Anxious About Outsourcing," *Washington Post*, January 31.

³⁶ Schroeder, Michael, and Timothy Aepfel. 2003. "Skilled Workers Mount Opposition to Free Trade, Swaying Politician," *Wall Street Journal*, October 10.

³⁷ Francois, Joseph, Hugh Arce, Kenneth Reinert and Joseph Flynn. 1996. "Commercial Policy and the Domestic Carrying Trade: A General Equilibrium Assessment of the Jones Act," *Canadian Journal of Economics*, February.

³⁸ Hines, Matt. 2004. "Greenspan:Offshoring Laws Could harm U.S.," *CNET News*. March 12.

engineering and technology education a national priority by increasing funding for math and science partnership; strengthening post-secondary education to ensure accountability for high student achievement; fostering teacher training in math and science; ensuring American workers are prepared for the high-skill jobs; supporting R&D in engineering and the physical sciences: and a permanent federal tax credit for R&D.³⁹

However, Bernstein pointed out a different view about a skill mismatch between the jobs the U.S. creates and the labor force coming out of U.S. schools. He argued that increasing offshoring, unemployment, and the slow job recovery are due to the problem of the labor demand side, not the labor supply side. According to Bernstein, it is white collar jobs and highly skilled jobs, such as accountants, computer programmers, medical technicians, and other professionals, etc. who worry about offshoring. These professionals are generally already at a high level in terms of education as well as skill. The lack of demand for these workers grew directly out of the lack of job creation in fields that disproportionately employ them. In this context, Bernstein worries that retraining program or skill improvement will unrealistically raise the bar in the job market. He argued that the government should focus more on the labor demand side, such as job creation.⁴⁰

Tax Policy

Critics of offshoring look at the current tax code as a source of offshoring. They point out that the current corporate tax system may encourage offshoring by permitting deferral of taxation on foreign earnings but not on domestic earnings, which results in the highest corporate tax burden. Accordingly, they proposed to end the preferential tax treatment of foreign earnings and lower the corporate tax on domestic earnings.⁴¹ Along with tax code reform, tax incentives focused on job creation in the U.S. are frequently proposed by offshoring critics. For example, state and local corporate tax relief targets to

³⁹ Strengthening U.S. Competitiveness in A Global Economy, The Voice of the innovation Economy, Tech Net. <http://www.technet.org/technetissues.global> competitiveness.

⁴⁰ Bernstein, Jared. 2004. "The Changing Nature of the Economy: The Critical Roles of Education and Innovation in Creating Jobs and Opportunity in a Knowledge Economy," Economic Policy Institute. March.

⁴¹ Brainard, Lael and Robert Litan. 2004. "Offshoring Service Jobs: Bane or Boon and What to Do?," The Brookings Institution. Policy Brief #132-2004.

companies that support their own communities with jobs that pay good wages and benefits.

Advocates of offshoring are raising the tax issue but from the different angle. Carafano argued that it is the tax code, not the companies, to be blamed for offshoring. The U.S.'s high corporate tax rate and "worldwide taxation" policy make it difficult for U.S. corporations to compete overseas.⁴² Currently, the federal government imposes a 35 percent tax on corporation income and states impose another 5 percent (on average). This cumulative 40 percent tax rate is higher than the 29.96 percent average corporate tax burden in OECD. Offshoring proponents are concerned that this tax system puts the U.S. companies at a disadvantage because most U.S. trading partners rely on "territorial taxation"-governments tax only income earned inside their borders.

Immigration Policy

Some observers have also linked service-sector offshoring to U.S. immigration policy. Critics of offshoring are concerned that temporary foreign workers in the IT industry acquired skills and business contracts during their U.S. stay that facilitated offshoring when those workers returned to their home countries.⁴³ When computer programmers and other technology workers were in short supply in the late 1990s, U.S. firms often temporarily hired skilled workers with H-1B visas. In October 2003, the annual quota for such visas declined to 65,000 workers from a limit of 195,000 workers in the previous three years.

Economists' view this matter differently. They argue that temporary immigration of highly skilled workers may have various economic effects. According to economic assessment, increased temporary immigration in the late 1990s may have held down the wages of some skilled U.S. workers. But according to economists, fluctuations in the number of temporary immigrations also may cushion U.S. employees against sharp downturns in demand because temporary workers often return to their home countries if they lose their employment in the United States.

⁴² Carafano, James and Tim Kane. 2004. "Protectionism Compromises America's Homeland Security," The Heritage Foundation. Backgrounder No.1777. July.

⁴³ Computer programmers and other technology workers were in short supply in the late 1990s, U.S. firms often temporarily hired skilled workers with H-1B visas.

Wage Insurance

Current law provides assistance to manufacturing workers displaced by international trade. In 2002, Congress amended the Trade Promotion Authority Act (TPA) to include a program providing wage insurance to workers older than fifty who can prove that trade is a “major cause” of their displacement. One of the opponents of offshoring, Brainard, proposed to lower or eliminate the age requirement and possibly to raise the compensation limit to reflect the likely higher income of many dislocated services workers.⁴⁴ His argument is that limiting the kinds of benefits available under the Trade Adjustment Assistance law to workers displaced by trade and offshoring raises fundamental questions of fairness.

Some economists, who support offshoring, advocate expanding and redirecting such programs, too. For example, Kletzer and Litan propose wage insurance for displaced workers as opposed to the current system, which emphasizes extended unemployment benefits. Under their proposal, wage insurance would reimburse eligible workers for some fraction of their wage loss, but the reimbursement would be paid only when the workers take a new job rather than remaining unemployed and would emphasize on-the-job learning instead of training programs.⁴⁵

4. Interest, Education, and Competitive Advantage in the US IT Industry

(Author: Mandy Chang)

As discussed in earlier sections, there are quite a few risks with offshoring. One such risk is dependence on outside suppliers, which stifles management, and leaves room for non-delivery. Others include loss of control when it comes to IT training, project direction and quality. Even with these potential risks, we still see rising rates of

⁴⁴ Brainard, Lael and Robert Litan. 2004. “Offshoring Service Jobs: Bane or Boon and What to Do?,” The Brookings Institution. Policy Brief #132-2004

⁴⁵ Kletzer, Lori G., and Robert E. Litan. 2001. “A Prescription to Relieve Worker Anxiety,” Institute for International Economics, *Policy Brief*, no.01-2, February.

offshoring. The risks are not enough to negate domestic hiring disincentive. In this section we will discuss education as a substantial factor of firms' decisions to offshore.

4.1 IT Education Trends

According to the 2002-2003 Taulbee Survey conducted by the Computing Research Association, we see a decrease of BS degree productions in the computer science and computer engineering fields within the US and Canada, beginning 2002. Prior to that, there was a steady increase in degree production. We see an even steeper drop of newly declared undergraduate majors in these fields. The most observable rationale for this occurrence is the burst of the dot-com bubble. In the late 1990's, computer scientists were in high demand – it seemed like a lucrative career choice as undergraduates were offered full-time positions even before they graduated. It was an era in which tech companies would vie for every computer scientist and engineer they could get, driving starting salaries sky-high. To meet the demands, there was a growing trend of computer scientists and engineers, as shown in the 1996-1997 Taulbee Survey. Enrollment in computer science and engineering majors in the United States and Canada grew as much as 40% annually, as we approached the new millennium.

4.2 Factors of Deterrence

The reason that there has been such a declining interest in computer science, computer engineering, and related fields is due to its loss of relative attractiveness. The dot-com frenzy eventually ended, and the tech field headed into a recession. Computer scientists who had previously pursued education, training, or careers in the computer science fields purely for money now had to reassess their career goals. Throughout 2001 and 2002, about half a million jobs nationwide were lost due to the recession, leaving the number of workers in the industry back where it had been before the dot-com boom. In addition to job loss, there was also a significant contraction in salaries paid out to workers in the IT industry. The Bureau of Labor Statistics reported in January 2003 that the unemployment rates for computer scientists and systems analysts are at 4.9%, computer programmers at 6.7%, database administrators at 3.4%, and networks systems and data

communications analysts at 7.4%. These figures do not take into account salary declines, benefit losses, and underemployed workers. Therefore the figures provided by the Bureau of Labor Statistics could well have understated the real effects on the workforce.

According to an evaluation of pre- and post-dot-com employment numbers, Professor Lazowska of the University of Washington suggests that there has been an increase of employment in the IT industry. It has been argued that a comparison of dot-com era salaries and employment to post-burst one over estimate the effects of the burst. However, if we compare employment during the dot-com era with employment in the current recession, we see a loss in attractiveness of the industry to workers. The reason we take on this comparison, is to show the short-term effects of unemployment on that sector.

4.3 Recession Not the Sole Culprit

Interestingly enough, the Office of Technology Policy of the Department of Commerce released a study recently that, “shows that between 1996 and 2006, the United States will require more than 1.3 million new high-tech workers to fill newly created jobs and to replace those workers exiting the high-tech field.” The question now is whether American universities are turning out graduates with the right skills that make them more employable than graduates in India, who are willing to work at a fraction of the wage.

As we have discussed in this paper, the key incentives to offshoring IT have economic and technological roots. Firms want higher profit margins, and by offshoring IT jobs to countries like India, firms can pay a fraction of the wage in the US for workers of equivalent caliber, thereby increasing their profits. However, one issue to discuss is the fact that there is a shortage of qualified human capital within the US. What the US is dealing with is not simply a discrete measurement of qualified workers but with a spectrum of worker productivity. What firms should really care about is the marginal productivity associated with employment in the US versus a country such as India.

There have been arguments that the US education curriculum is not structured to give workers the relevant expertise in IT. Critics of the education curriculum have

observed the skill sets produced by US universities and have concluded that the way computer science courses are taught in the US puts Americans at a disadvantage compared to workers in India. Computer science and related fields rank high on the list of industries supported by the Indian government. India's policy is such that the IT industry has financial and political support to develop at higher rates than in the US. According to a paper written by Craig A. VanLengen, "CIS Curriculum Development Post-dot-com", IT curriculum in the US has always focused on teaching students how to program. A curriculum focused on programming and theory of the field is not detrimental in itself, but one that lacks innovative training could be.

VanLangren states that, "Organizations want US IT workers to be project managers and business/IT liaisons. They must be able to manage IT projects where requirements are obtained from business units, communicate those requirements to in-house IT functions and offshore outsourcers. They must then be able to direct the assembly of the components into an effective functioning system for the business." The IT industry is no longer just about programming and troubleshooting, but about learning how to deal with other people, and manage projects. The IT industry now requires a workforce with hybrid skills. Not only does the worker have to be trained technically, but he must also be educated in the business world.

Recent headlines have many employees in the US IT industry even more worried. IT offshoring has always been occurring, but recently has accelerated due to the high domestic salaries of the dot-com era. The key for IT professionals seeking jobs in the industry is to develop skills that cannot be easily outsourced. "Proof that programming and other lower-level IT skills have become commodities is the concern of software companies and developers in India," noted VanLengen. In effect, the lower end IT jobs positions have been the first to be offshored in efforts to cut costs. Traits that make a job in the IT industry easy to offshore are:

- 1) Highly repetitive work
- 2) Physical distance to the consumer is of little importance

- 3) Easy to break down into smaller parts
- 4) Little constant collaboration is needed
- 5) There is a given protocol of how things are to run

The five traits listed above can be used to describe the most commonly offshored jobs: call centers, and software programming. Computer science and the IT field are even more of an evolutionary industry now than it was before. Educators now need to work even more closely with businesses to figure out what types of skills are needed; and more importantly, which ones are least likely to be outsourced. Some of the IT job functions that are less likely to be offshored are project management, security, and wireless networking, in which timing is essential, and which require a high degree of collaboration and innovation. In another paper published by Hoffman (Demand 2002), he states that based on a study done by ITAA/Dice on the IT industry, skills that are highly demanded include Oracle, SQL, C++, and Java.

4.4 Management as a partial solution, and education curriculum implications

All economic recessions eventually recover with time, but outsourcing can have a lasting effect on the industry. There is little that the US can do to compete with the costs of labor in foreign countries. Therefore it is imperative to keep the IT industry alive domestically and make outsourcing a relatively trivial aspect to the whole industry. Computer scientists should become involved in the processes that are occurring abroad. It is the time for traditional IT workers that had started out as programmers to move up the ladder and manage the outsourcing business. There is plenty of room for management because without proper management, firms might even see their profit margins dwindle due to increased costs of communications, increased potential non-delivery, and security breaches. However, management is not in itself a solution to outsourcing. The US IT industry still needs to keep a competitive advantage.

Some considerations that the government could take are to mandate university curriculum standards for computer science and related fields. Instead of solely requiring

theory and basic programming skills, curriculum should also revolve around innovative projects, business models, current events, international affairs, public policy, and economics. Many undergraduate programs require their undergraduates to take a separate track (or minor), such as in economics. But the introductory and intermediate courses offered are also theoretical, and lack real-world applications. Because the undergraduate engineering programs we are referring to are at four-year universities, there is a time constraint on how much an individual can learn. One option might be for government also to mandate higher high school standards, or increase availability of courses. Very few high schools offer courses in computer science, business, and sufficient economics to pass out of even the introductory courses at a university.

If less and less programming skills are required in the US because the jobs are being offshored to countries like India that have government legislation to encourage the IT industry, then what is left for the IT curriculum in America's universities? We have seen a significant decline in interest of the field through the Taulbee Survey, yet computer science classes are still being filled at top-notch universities like Carnegie Mellon. The question is how we keep IT thriving in the US, and what types of courses, skills, and methods are crucial to the industry. Curriculum needs to evolve with the industry. The US should take the management and innovation aspects of IT, and expand them.

IBM's Grady Booch discussed that, "[Computer scientists] are good at out-of-the-box thinking but weaker on fundamental business skills such as teamwork and project design. Many [American] universities teach people how to program, but they don't teach them how to work in projects. They don't teach them how to design."

4.5 Innovation As A Complementary Remedy

Like many industries, IT is one that is gradually becoming perfectly competitive. The only way to break free of this is to procure a competitive advantage and utilize it. Low cost is a competitive advantage that India has. As stated earlier, hiring an IT worker in India costs only a fraction of hiring an IT worker in the US.

Through observation we can tell that establishing a firm in the US is a lot more costly than establishing one abroad. Considering corporate responsibilities such as company benefits, and relatively higher salaries, the driving cause of IT firms still being born in the US is that the US is an environment in which information and innovation exists in greater amounts. The US's competitive advantage is that it has the resources to push innovation to higher levels.

Competitive advantage is something that can only be maintained by action. It is something that can be maneuvered by public policy. If innovation is the U.S.'s competitive advantage, then the government could fund more innovative projects, R&D, and offer monetary prizes as incentives. Moreover, the government must be conscious of problems of breach of trust and non-delivery in order to ensure an efficient allocation of funding. Much of the time, capability and level of conservatism on the part of proposers and researchers are hard to gauge. Government would need to generate specific guidelines to funding distribution, and monitor research closely.

4.6 Getting the Right Combination

One area particularly influenced by the downturn in the dot-com era, and by offshore employment in the tech industry is the Silicon Valley. There is an argument that offshoring could potentially be good for the tech industry in the US: if the important jobs are kept domestic and the routine ones are sent abroad, then there is more room for innovation and management in the US. This way, the US IT industry could stay one step ahead of all other foreign competitors like India. On the flip side, if offshoring occurs without sufficient innovation domestically, we will have a case where competitors in other countries catch up technologically. In the case of the Silicon Valley, if innovation does not keep up, then eventually more and more IT jobs will be sent abroad, and other countries will outdo the US IT industry. According to the Bureau of Labor Statistics, a programmer in San Jose earns a mean of \$77,690 every year plus benefits, and the same job pays about \$10,900 in India (according to salary information firm PayScale)

"Silicon Valley has always been on top of the technology food chain," Kroll said. "It's always managed to stay one step ahead. If this region stays on the cusp of innovation, the theory goes, new industries will be invented here, and because of Silicon Valley's unique cross-pollination of businesses, venture capitalists and talented workers, even ideas born in other places will be nurtured into moneymaking concerns here. These new industries will create new, high-paying jobs locally, at least in the early years."

Public policies altering education curriculum and training programs can be implemented, but logistically, the effects will not be visible in the near future. Some other policies that the government can implement to slow the process of outsourcing immediately take on political, economic, trade and immigration factors. One of the most commonly mentioned solutions to offshoring is for the government to offer tax breaks to US firms so that they will hire domestically. How feasible this is as a permanent solution, we will discuss in the following section, along with other considerations.

Conclusion

In this paper, we have examined the most pertinent economic and non-economic considerations to offshoring in the IT industry. Through our research, we have found that although there are several costs and risks associated with offshoring in this industry, the benefits to offshore are great enough to have made IT offshoring the leading outsourced function. Moreover, by examining the incentives to offshore in the IT industry, important insight is revealed as to what the future of IT offshoring may look like and what role public policy has to play in shaping the future of U.S. companies who offshore.

Thus, in the second half of the paper, we examined how public policy can influence US competitiveness in the IT industry. We find that even though the US has had a relative advantage over low-wage countries such as India, it can slowly lose its foothold if US public policy does not promote education, management skills, and innovation in the IT industry. If properly implemented, these policies can be designed to make IT a "win-win" industry for all.

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