United States Government Accountability Office

GAO

Report to Congressional Committees

November 2005

OFFSHORING OF SERVICES

An Overview of the Issues

G A O

Accountability * Integrity * Reliability

GAO-06-5

November 2005

OFFSHORING OF SERVICES

An Overview of the Issues

GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-06-05, a report to congressional committees

Why GAO Did This Study

Much attention has focused on the "offshoring" of services to lower-wage locations abroad. Offshoring generally refers to an organization's purchase of goods or services from abroad that were previously produced domestically. Extensive public debate has arisen about both the potential benefits of services offshoring, such as lower consumer prices and higher U.S. productivity, as well as the potential costs, such as increased job displacement for selected U.S. workers.

In response to widespread congressional interest, GAO conducted work under the Comptroller General's authority to help policy makers better understand the potential impacts and policy implications of services offshoring. This report: (1) provides an overview of experts' views on the potential impacts of services offshoring, (2) describes the types of policies that have been proposed in response to offshoring, and (3) highlights some key areas where additional research might help advance the debate about offshoring.

In its comments, the Department of Commerce generally agreed with the findings of this report. Commerce, Treasury, and the Office of the United States Trade Representative also provided technical comments that have been incorporated as appropriate.

www.gao.gov/cgi-bin/getrpt?GAO-06-05.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Sigurd Nilsen at (202) 512-7215 or nilsens@gao.gov.

What GAO Found

Analysts of the offshoring phenomenon have expressed a range of views about the likely impacts of offshoring on four broad areas. The differing views reflect several factors: the fact that services offshoring is a relatively recent development whose impact is not fully known, the limitations of available data on offshoring, and different theoretical expectations about how services offshoring will impact the U.S. economy. These four areas are:

- *The average U.S. standard of living*: Traditional economic theory generally predicts that offshoring will benefit U.S. living standards in the long run. However, some economists have argued that offshoring could harm U.S. long-term living standards under certain scenarios, such as if offshoring undermines U.S. technological leadership.
- *Employment and job loss*: While economic theory generally predicts that offshoring will have little effect on overall U.S. employment levels in the long-run, there is widespread recognition that pockets of workers will lose jobs due to offshoring, though there is disagreement about the expected magnitude of job loss and implications for displaced workers.
- *Distribution of income*: Some economists maintain that offshoring could increase income inequality in the U.S., while others argue that changes in the income distribution are driven primarily by factors other than offshoring, such as technological change.
- *Security and consumer privacy*: Experts express varying degrees of concern about the impact of services offshoring on the security of our national defense system and critical infrastructure—such as utilities and communication networks—as well as the privacy and security of consumers' financial and medical information.

A wide range of policies has been proposed in response to concerns about offshoring and its potential effects. These proposals can be categorized into four areas by the concerns they seek to address: (1) improving U.S. global competitiveness, (2) addressing effects on the U.S. workforce, (3) addressing security concerns, and (4) reducing the extent of offshoring. Some analysts have recommended policies in more than one area.

Determining appropriate policy responses to the offshoring phenomenon is challenging due to the limited state of knowledge about the extent and impacts of offshoring. Nonetheless, there are some key areas where additional research might help advance the debate, such as trends in the wages and skill levels of jobs being offshored, reemployment experiences of workers displaced by offshoring, and the extent to which current laws and practices in different sectors of the economy mitigate any increased security-related risks posed by offshoring. In the face of limited federal data, researchers have begun using a variety of approaches to examine such areas.

Contents

Letter 1

Results in Brief 2
Background 5
While Traditional Economic Theory Predicts That Offshoring Will Benefit the Overall Economy, Concerns Have Been Raised about Four Areas of Potential Impact 13
A Wide Range of Policies Have Been Proposed to Address Concerns about Offshoring's Potential Impacts 40
Additional Research in Key Areas May Help Advance the Offshoring Debate 50
Concluding Observations 59
Agency Comments 60

Appendix I **Scope and Methodology** 64

Appendix II **List of Experts Interviewed** 66

Appendix III **Comments from the Department of Commerce** 69

Appendix IV **GAO Contacts and Staff Acknowledgments** 70

GAO Related Products 71

Bibliography 73

Table

Table 1: Some Key Areas for Additional Research on Services Offshoring and Possible Approaches for This Research 54

Figures

Figure 1: Overall U.S. Trade Balance and Trade Balance in Services 8
Figure 2: Timeline of Legislation Enacted in Response to Trade-Related Concerns 12
Figure 3: Four Areas of Potential Impact of Offshoring 14
Figure 4: Real Hourly Wage Growth and Labor Productivity Growth, Wages, and Labor Compensation as a Share of National Income 21

Abbreviations

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BPT	business, professional, and technical
COTS	commercial off the shelf
DOD	Department of Defense
GAO	Government Accountability Office
IT	information technology
MLS	Mass Layoff Statistics
TAA	Trade Adjustment Assistance
VAT	value-added tax
WARN	Worker Adjustment and Retraining Notification
WIA	Workforce Investment Act of 1998
WTO	World Trade Organization

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

November 28, 2005

Congressional Committees

Although "offshoring" has existed for decades in the manufacturing sector, recently concerns have been raised about the emergence of services offshoring. Offshoring generally refers to the practice, by either U.S. companies or government entities, of replacing goods or services previously produced domestically with goods and services produced abroad. Advances in information technology (IT) and developments in the management of business processes, coupled with a large pool of educated workers in other countries, allow companies to move services work outside of the U.S. as part of a larger trend toward global interdependence. For example, U.S. companies are now able to move software programming, accounting, or telephone call center services to lower-wage locations such as India, the Philippines, and Eastern Europe. While U.S. government data have limitations, these data indicate that in recent years the imports of services associated with offshoring have been growing.[1] This has contributed to heightened public debate about both the potential benefits of services offshoring, such as lower consumer prices and higher U.S. productivity, as well as the potential costs, such as increased job displacement for U.S. workers.

Services offshoring raises issues on a wide array of topics, including the economy, workforce, consumer privacy, and national security. Moreover, various pieces of federal and state legislation have been introduced, such as bills to restrict the offshoring of some government services or to provide more assistance for displaced workers. In response to widespread congressional interest, we have prepared this report under the Comptroller General's authority to help the Congress understand and examine the potential impacts and policy implications of services offshoring. As this report may prove helpful in the deliberations of committees with oversight responsibilities or jurisdiction over issues raised by offshoring, we have addressed this report to these committees. Although this report focuses on services offshoring, much of our discussion is applicable to offshoring in the manufacturing sector as well.

[1]GAO, *International Trade: Current Government Data Provide Limited Insight into Offshoring of Services*, GAO-04-932 (Washington D.C.: Sept. 22, 2004).

This report addresses three broad areas. First, it provides an overview of experts' views on the potential effects of offshoring. Where possible, we identify empirical research that provides support for various views. Where experts express different opinions on the potential effects of offshoring, we highlight the key issues that underlie the debate. However, the report does not attempt to resolve such differences in views. Second, the report provides an overview of the various types of policies that have been proposed in response to offshoring. We generally categorize policy proposals on the basis of the broad concerns that they seek to address, and we provide illustrative examples of policies that have been proposed. Third, the report highlights some key areas where additional research might advance the debate about the effects and policy implications of offshoring. Our discussion identifies some relevant data sources and potential approaches for such research.

To carry out this study, we conducted an extensive literature review and interviewed a wide range of experts, often with conflicting points of view, from academia, government, think tanks, industry groups, and labor groups (see app. II for a list of experts interviewed). In addition, we attended several conferences to hear presentations on services offshoring and dialogue with experts during the course of our work. We conducted our review from May 2004 through November 2005 in accordance with generally accepted government auditing standards. See appendix I for a detailed discussion of our scope and methodology.

Results in Brief

While traditional economic theory predicts that offshoring is likely to benefit the overall economy, concerns have been raised about four areas of potential impact: on the average U.S. standard of living, employment and job loss, income distribution, and security. Observers of offshoring have expressed a range of views about the likely impact of offshoring on each of these areas. These debates reflect several factors: the fact that services offshoring is a relatively recent development whose impact is not fully known, the limitations of currently available data about the extent of offshoring and its impacts, and different theoretical expectations about how services offshoring will impact the U.S. economy.

- **Potential impacts on the average U.S. standard of living**: Traditional economic theory on international trade predicts that in the long run, offshoring is likely to be beneficial for the average U.S. standard of living; however, some economists have argued that offshoring could harm U.S. living standards if it contributes to the erosion of important U.S. industries, undermines U.S. technological leadership, or leads to a

decrease in average U.S. wages. Underlying this debate are different predictions about what new areas of comparative advantage the U.S. will develop as globalization intensifies—that is, what new goods and services will be developed that are produced most efficiently in the U.S.—and different assessments about whether offshoring is contributing to downward pressure on U.S. wages.

- **Potential impacts on employment and job displacement**: Many economists agree that offshoring is not likely to affect aggregate U.S. employment in the long run but acknowledge that in the short run some workers will lose their jobs when employers relocate production abroad. In addition, some economists argue that an important effect of offshoring and increased trade are structural changes that will generate permanent shifts in the types of work conducted by the U.S. labor force. However, there is debate about the expected magnitude of job losses related to offshoring, the implications of job displacement for those workers who are directly affected by it, and the expected direction of any structural changes in the labor market caused by offshoring.

- **Potential impacts on distribution of income**: There is disagreement among economists about whether offshoring is likely to significantly affect the distribution of income in the U.S. Some economists have expressed concern that offshoring could accelerate income inequality in the U.S.; however, others argue that changes in the income distribution are driven primarily by factors unrelated to offshoring, such as technological developments, and still others point out that offshoring could potentially decrease income inequality. Underlying these disagreements are debates about the extent to which, in the long run, offshoring will change the demand for U.S. workers at various income and skill levels.

- **Potential impacts on national security and consumer privacy**: Experts express varying degrees of concern about the impact of services offshoring on the security of our national defense system and critical infrastructure—systems and structures that are essential to the nation, such as utilities and communication networks—as well as the privacy and security of consumers' financial and medical information. Underlying these debates are unresolved questions about the extent to which offshore operations, such as software development or medical records processing, pose increased security risks and the extent to which current laws and practices mitigate these risks.

Analysts of the offshoring phenomenon have proposed a broad range of policies in response to offshoring, and these proposals represent a diverse set of potential directions for public policy in this area. We have

categorized these proposals into four areas; some analysts have recommended policies in more than one area.

- **Proposals to improve U.S. global competitiveness**: Many observers view offshoring as one aspect of a much broader process of increasing global interdependence and propose policies that seek to improve the ability of U.S. firms and workers to compete in the global economy. Proponents of these policies contend that increased foreign competition signals a need for policies to help the U.S. economy strategically develop new areas of comparative advantage. Examples of these proposals include increasing government support for research and development and improving education and training of U.S. workers.

- **Proposals to address effects on the workforce**: In response to concerns about job displacement due to offshoring, many have proposed policies to assist displaced workers who bear the immediate costs of offshoring. Some proposals would build on existing programs, such as extending the Trade Adjustment Assistance program to dislocated services workers. Currently, the program provides workers in the manufacturing sector who are dislocated due to trade with extended unemployment benefits and subsidized retraining. Other proposals would involve broader and more extensive reforms, such as instituting a wage insurance program to replace a portion of wages at reemployment for workers who experience wage declines after displacement or establishing universal or portable health insurance.

- **Proposals to enhance security**: Some proposals seek to address concerns that offshoring could pose risks to national security, critical infrastructure, or the privacy of personal data. These proposals can be broadly categorized into two types—those that would restrict the type of work that can be sent to foreign locations and those that would strengthen requirements governing security and data protections.

- **Proposals to reduce the extent of offshoring**: Some policy proposals address concerns about offshoring by government agencies or the private sector by seeking to reduce the extent of offshoring's occurrence. For example, some proposals would prohibit or constrain offshoring in government procurement. Other proposals seek to modify firms' incentives to offshore by altering tax provisions or enhancing incentives for firms to locate work in the U.S.

Determining appropriate policy responses to the offshoring phenomenon is especially challenging due to the limited state of knowledge about offshoring and its effects. Nonetheless, areas where further research might

help advance the debate about the impacts and policy implications of services offshoring include

- impacts of offshoring on various sectors of the U.S. economy, particularly sectors that are emerging as new sources of comparative advantage;
- impacts of offshoring on the workforce, such as numbers of workers displaced and their reemployment experiences;
- impacts of offshoring on the U.S. income distribution, including trends in wage levels of jobs moving offshore; and
- any increased security-related risks posed by offshoring and the extent to which these are mitigated by current practices and laws.

Further research in these areas could help inform policy making by providing more information about the nature and magnitude of any problems resulting from offshoring. Researchers have begun to use a variety of approaches to examine these areas, such as in-depth studies of services offshoring in particular industries (e.g., semiconductors and radiology) and statistical methods applied to current federal data series (e.g., to obtain information on the re-employment experiences of workers dislocated due to trade). While these approaches face various challenges and limitations, they offer some prospect for additional insights on aspects of the services offshoring phenomenon.

In its comments, the Department of Commerce generally agreed with our observations. Commerce stated that it appreciated the thoroughness of our review and that the report will be a useful reference starting point for discussions of the causes and impacts of offshoring. Commerce, Treasury, and the Office of the United States Trade Representative also provided technical comments, which we incorporated into the report as appropriate.

Background

Defining Offshoring

Offshoring generally refers to a company's purchases from abroad (imports) of goods or services that were previously produced domestically. A company may offshore services either by purchasing services from another company based overseas or by obtaining services in-house through an affiliate located overseas. For example, a U.S.-based

company might stop producing parts of its accounting and payroll services in-house and instead outsource them to a foreign-based company. A U.S.-based multinational company might also offshore by moving parts of its accounting and payroll services from its domestic operations to its foreign affiliate, thus keeping the services in-house. Importing services that had previously been acquired domestically or relocating services to foreign affiliates both can result in the displacement of U.S. service production and employment, though as we discuss later, will likely have other economic effects, such as on consumer prices and productivity.

However, other business activities that do not directly result in the displacement of U.S. workers are sometimes included in broader definitions of offshoring. Offshoring could include other business activities that may result in foregone job creation domestically but would not result in job losses. For example, a U.S.-based company might expand its accounting and payroll services through a foreign company or affiliate, but do so without affecting its U.S. workforce.[2]

Broader definitions of offshoring sometimes include the movement of production offshore. This definition of offshoring focuses on U.S. companies' investing in overseas affiliates. Offshoring defined in this way could but would not necessarily result in the displacement of U.S. service production or employment. For example, a U.S.-based company investing in its overseas affiliate to produce accounting and payroll services to sell to other companies abroad might do so without affecting its production and employment levels in the U.S.

Types of Services Associated with Offshoring

Types of services associated with offshoring tend to be those that are capable of being performed at a distance and whose product can be delivered through relatively new forms of advanced telecommunications. Examples of these business functions include software programming and design, call center operations, accounting and payroll operations, medical records transcription, paralegal services, and software research and testing.

More than three-quarters of U.S. private-sector employees are in service-providing industries; however, not all services jobs are likely to be at risk

[2]For more information about the definition of offshoring, see appendix II of GAO-04-932.

from offshoring.[3] Many services jobs, such as child care providers and hairdressers, require face-to-face contact with customers. Other jobs, such as transportation workers, construction workers, and auto mechanics, require hands-on contact with physical equipment. In addition, some work, such as marketing and creative design, may be done more efficiently and productively in close proximity to customers and other workers.

U.S. Trade and Foreign Direct Investment

While government data on trade and foreign direct investment offer limited insight into the extent of offshoring, the data provide some evidence that services imports are growing.[4] Trade data from the Department of Commerce's Bureau of Economic Analysis (BEA) show that imports of services associated with offshoring are growing. For example, U.S. imports of business, professional, and technical services grew from $20.8 billion in 1997 to $40.7 billion in 2004—an increase of about 10% per year.[5] It is important to note that these import data show that U.S. entities have been purchasing these services offshore, but the data do not indicate whether these entities had previously been purchasing these services from domestic U.S. sources.

The U.S., Canada, and the United Kingdom are among the world's leading exporters of services. According to World Trade Organization data, the U.S. was the world's largest exporter of commercial services in 2004.[6] BEA data show that in 2004 Canada and the United Kingdom accounted for 42 percent of the U.S.'s imports of unaffiliated business, professional, and technical (BPT) services, or BPT services traded between firms that are separate entities from each other.

The U.S. currently exports more services than it imports and therefore maintains a trade surplus in services overall. In 2004, this surplus was nearly $48 billion, according to BEA data. However, since 1997, the trade surplus in services has generally been shrinking. At the same time, the

[3]Goods-producing industries may also employ workers in "services" occupations (e.g., computer programmers at a computer manufacturer or accountants at an automobile company).

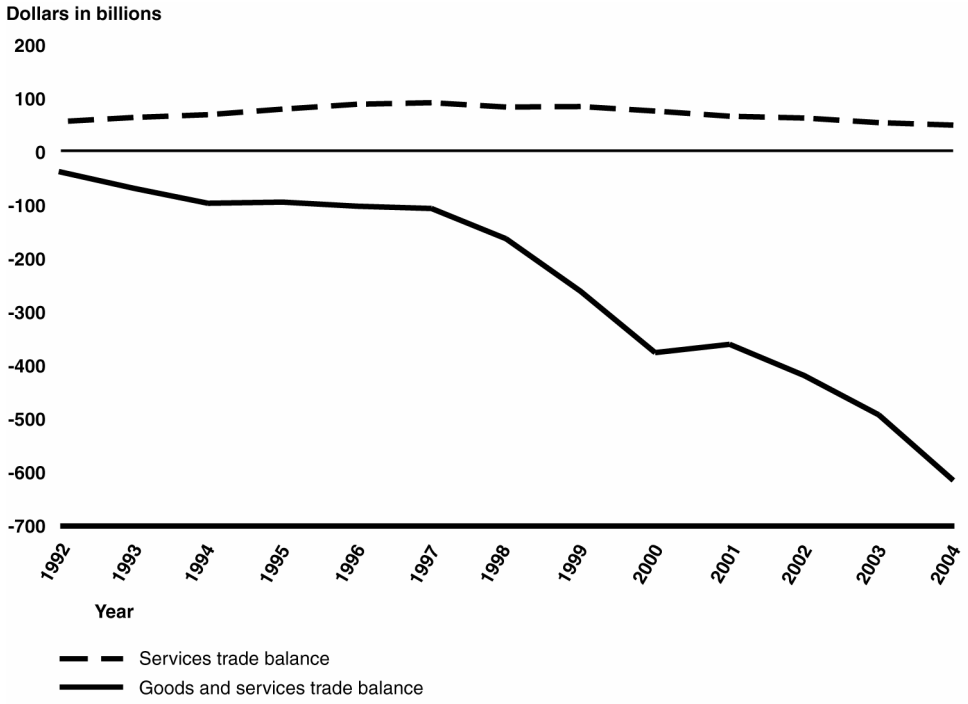
[4]See GAO-04-932.

[5]These numbers have not been adjusted for inflation.

[6]The World Trade Organization defines commercial services as services (as defined by the International Monetary Fund and Commerce Department's Bureau of Economic Analysis) less government services.

overall trade deficit has generally been expanding (see fig. 1), though imported services comprise a small share (about 17 percent) of total U.S. imports of goods and services.

Figure 1: Overall U.S. Trade Balance and Trade Balance in Services



Source: GAO presentation of Bureau of Economic Analysis.

BEA data on direct investment abroad capture U.S. multinational companies' establishment of affiliates abroad, including establishment of affiliates to produce services. The data suggest that most services produced abroad by U.S. majority-owned foreign affiliates are sold to foreign markets rather than to the U.S. In addition, the data show that U.S. direct investment abroad tends to be concentrated in other developed countries, rather than in developing countries frequently associated with services offshoring. For example, according to BEA data, 61 percent of U.S. direct investment abroad in 2004 took place in the European Union, Canada, and Japan. In the same year, U.S. direct investment in developing countries that are frequently cited as suppliers of offshore services (e.g., India, the Philippines, Malaysia, and China) was relatively small—about

1 percent or less of total U.S. direct investments in each case.[7] In addition, BEA data from 2003 show that over nine-tenths of services sold by U.S.-majority-owned nonbank foreign affiliates are sold to foreign markets rather than to the U.S.

BEA data also show that the U.S. receives large amounts of direct investment by other countries. In 2004, the U.S. received nearly $96 billion in foreign direct investment. The countries that are the largest recipients of U.S. foreign direct investment abroad are also the largest foreign direct investors in the U.S., with the European Union, Japan, and Canada accounting for 82 percent of foreign direct investment in the U.S. Foreign firms investing in the U.S. employ U.S. workers. U.S. affiliates of foreign multinational corporations employed 5.3 million U.S. workers in 2003, accounting for 5 percent of total U.S. employment in private industries.[8]

Enabling Factors and Incentives for Offshoring

Firms have been offshoring long before the recent trend in services offshoring. In previous decades, U.S. manufacturing companies were motivated to offshore because of the low costs and availability of skilled labor, production and supply networks in some developing countries, and reductions in cost of transporting goods. At the same time, U.S. companies divided their production processes into discrete pieces, which allowed them to offshore some of the components. As a result, some businesses offshored total production, and others offshored parts of the production process. Firms generally retained higher-end, higher-skilled services functions in the U.S., such as management, finance, marketing, and research and development.

Offshoring has recently expanded into services due to three key factors. First, technological advances, such as advances in telecommunications and the emergence of the Internet, have enabled workers in different locations in the world to communicate and be connected electronically and has also facilitated the digitization and standardization of activities needed to complete business processes. These changes in turn have allowed business processes to be divided into smaller components, some of which could be done in different locations. For example, standardized software has made it possible for firms to outsource financial or human

[7]BEA's country-level foreign-direct investment data is valued on a historical cost basis.

[8]These numbers refer to employment by majority-owned nonbank U.S. affiliates of foreign multinational corporations.

resources activities to a separate overseas company that performs them for many clients, rather than handling the functions internally.[9] Thus, in many cases, the offshoring of services constitutes an outgrowth of outsourcing business functions. Second, countries such as India, China, Russia, and much of Eastern Europe have increasingly opened their borders to the global economy. Third, other countries have highly educated populations with the technical skills for performing services and technology-related work.

According to several business studies, a primary reason that organizations engage in offshoring is to reduce costs.[10] The cost savings from offshoring are primarily the result of differences between the U.S. and developing countries in the unit cost of labor, the worker compensation (wages and benefits) that must be paid to produce one unit of goods or services. Unit labor costs are lower for certain services in developing countries primarily because workers' wages in those countries are lower than in the U.S. However, unit labor costs also depend upon the productivity levels of workers. Although labor costs in a developing country may be lower than in the U.S., it may still be possible for the unit cost of labor to be lower in the U.S. than the other country if U.S. workers' productivity is much higher, meaning than the U.S. worker can produce many more or higher quality products within a certain time frame than a worker in the other country. Differences in unit labor costs can also result from differences in costs of employee benefits, such as health care and pension benefits. In addition, cost savings can be affected by currency exchange rates, countries' tax policies, and government-provided incentives such as tax rebates.

Aside from cost savings, firms may have other incentives to offshore. Access to a workforce in different time zones across the globe may enable companies to conduct work around the clock and consequently meet worldwide customer needs. Establishing a presence in foreign countries can provide companies access to overseas markets. In addition, offshoring

[9]Rafiq Dossani and Martin Kenney, "Went for Cost, Stayed for Quality? Moving the Back Office to India," *Berkeley Roundtable on the International Economy Paper*. BRIEWP156 (Berkeley, Calif.: University of California, Berkeley, 2003).

[10]Forrester Research, Inc., *Offshore Outsourcing: The Complete Guide* (Sept. 7, 2004); Booz Allen Hamilton, *Business Process Offshoring: Making the Right Decision* (December 2003); The Boston Consulting Group, *Capturing Global Advantage: How Leading Industrial Companies Are Transforming Their Industries by Sourcing and Selling in China, India, and Other Low-Cost Countries* (April 2004).

non-core services can enable companies to focus their resources on their core functions. By outsourcing non-core functions to overseas firms that specialize in them, businesses may also experience improvements in the quality of these functions.

Although firms may have many incentives to offshore, they may also face disincentives to offshore. Offshoring has several costs associated with it, including costs to start up an offshore operation and to manage and train an offshore workforce. In addition, some experts have noted that wages of workers in developing countries are rising more rapidly than U.S. wages, therefore shrinking the cost savings of offshoring over time.[11] Furthermore, offshoring carries potential risks, such as possible political instability in overseas locations, less reliable civil infrastructure, exchange rate volatility, less developed legal and regulatory systems, and risks to intellectual property.

Legislation Enacted in Response to Trade-Related Concerns

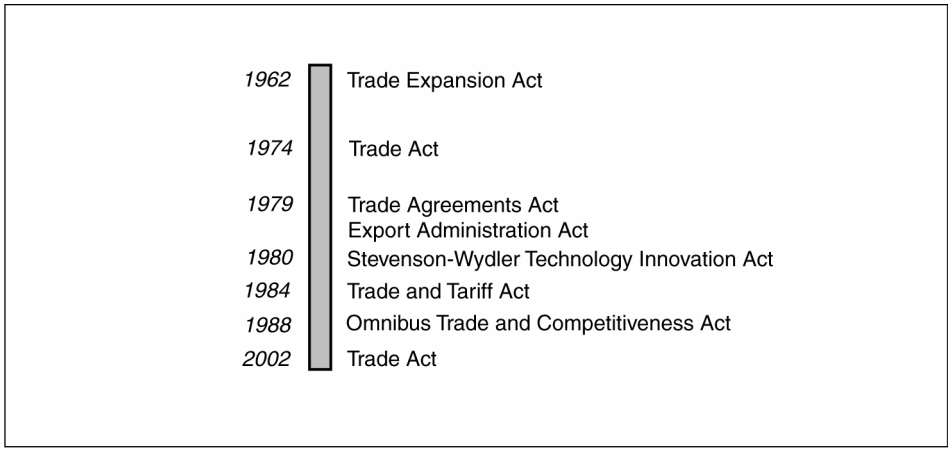
In the last few decades, the Congress has enacted various pieces of legislation related to trade and increasing global interdependence, primarily due to concerns about their effects on the manufacturing sector. (See fig. 2.)[12] This legislation sought to expand U.S. exports; establish fair trading practices; assist workers, firms, and communities adversely affected by trade; and improve U.S. competitiveness through support for education and research and development. For example, trade acts of 1962, 1974, and 1979 sought to expand U.S. exports by establishing mechanisms for negotiating and entering into trade agreements. The trade acts also established remedies for industries hurt by import competition through unfair trade practices. The Trade Act of 1974, as amended, established a trade adjustment assistance program to provide financial assistance and

[11]Deloitte Touche Tohmatsu, *Making the Off-Shore Call: The Road Map for Communications Operators* (2004); Nirupam Bajpai, Jeffrey Sachs, Rohit Arora, and Harpreet Khurana, "Global Services Sourcing: Issues of Cost and Quality," *CSGD Working Paper* 16 (New York, N.Y.: The Earth Institute at Columbia University, June 2004). However, some experts note that although wages are rising in some developing countries, the wage differential between the U.S. and developing countries is likely to remain sizable for some time to come. In addition, as wages rise in some developing countries, firms could turn to other countries where labor costs remain low.

[12]These include the Trade Expansion Act of 1962 (Pub. L. No. 87-794), Trade Act of 1974 (Pub. L. No. 93-618), Trade Agreements Act of 1979 (Pub. L. No. 96-39), Export Administration Act (Pub. L. No. 96-72), Stevenson-Wydler Technology Innovation Act of 1980 (Pub. L. No. 96-480), Omnibus Trade and Competitiveness Act of 1988 (Pub. L. No. 100-418); and the Trade Act of 2002 (Pub. L. No. 107-210).

retraining to workers involved in the manufacturing of articles who lost their jobs due to foreign competition. In addition, the act also established a program that enabled manufacturing firms and communities hurt by trade to receive technical assistance and financial support to develop new strategies to improve their competitiveness. Congress enacted various other legislation to enhance the competitiveness of the U.S. economy by improving education and supporting research and development. Among others, these included the Stevenson-Wydler Technology Innovation Act of 1980, which authorized the creation of various technology centers. With regard to services specifically, the Trade and Tariff Act of 1984 required the Commerce Department to establish a program on international trade in services and to issue a report every 2 years.[13] In addition, the Omnibus Trade and Competitiveness Act of 1988 directs the Secretary of Commerce to conduct a benchmark survey of services transactions.

Figure 2: Timeline of Legislation Enacted in Response to Trade-Related Concerns



Source: GAO analysis.

Aside from these laws, other legislation enacted by the Congress may address some concerns raised by trade and globalization. For example, under the Workforce Investment Act of 1998 (WIA), the Department of Labor oversees an employment and training system operated by states and localities to assist displaced workers in obtaining new jobs, which could include workers who become displaced due to trade-related reasons.[14]

[13]Pub. L. No. 98-573; 19 U.S.C. § 2114b.

[14]Pub. L. No. 105-220; 29 U.S.C. § 2801.

WIA funds may also be used to provide training for employed workers to upgrade their skills.

While Traditional Economic Theory Predicts That Offshoring Will Benefit the Overall Economy, Concerns Have Been Raised about Four Areas of Potential Impact

Traditional economic theory predicts that expansion of international trade, including offshoring, will have beneficial effects on the U.S. economy, but a number of concerns have also been raised about the potential economic and social impacts of offshoring. We have identified four areas of concern about the potential impacts of offshoring: potential impacts on the average U.S. standard of living, including average wages; employment and job displacement among American workers; the distribution of income; and national security and consumer privacy. Economists and other policy analysts have expressed in literature and in interviews with us a range of views about the likely impacts of offshoring on each of these areas. This diversity of views reflects several factors: the fact that services offshoring is a relatively recent development in international trade whose impact is not yet fully known; the limitations of currently available data about the extent of offshoring and its impacts; and different theoretical expectations about the likely impact of expanded trade in services on the U.S. economy. The issues identified in this section may not be exhaustive; others may raise concerns about offshoring that are not discussed in this report. Figure 3 summarizes experts' different views about the four areas of potential impact for the U.S. that we identify.

Figure 3: Four Areas of Potential Impact of Offshoring

Impacts on the average U.S. standard of living

- Economic theory generally predicts that offshoring will be beneficial for average U.S. living standards in the long run.
- However, some economists have argued that offshoring could harm average U.S. living standards in some circumstances.
- Underlying these disagreements are different predictions about what sectors of the U.S. economy will emerge as new sources of comparative advantage and whether offshoring will contribute to downward pressure on U.S. wages.

Impacts on employment and job displacement among American workers

- Many economists expect offshoring to have little effect on long-run aggregate employment, though offshoring could affect the structure of the U.S. job market.
- There is widespread recognition that offshoring will cause some job losses but considerable disagreement about the expected magnitude.
- Underlying these disagreements are different predictions about the expected extent of job losses due to offshoring and the costs of displacement for those workers who experience job losses.

Impacts on the distribution of income

- Some economists expect that offshoring could increase income inequality by changing the distribution of wage income among U.S. workers.
- However, there is disagreement about the expected magnitude of this impact, and some believe offshoring is not the primary cause of increasing income inequality.
- Underlying these disagreements are different predictions about the characteristics of jobs (e.g., wages, skill levels) that will be lost due to offshoring and the characteristics of jobs that will be created.

Impacts on national security and consumer privacy

- Many experts have raised concerns that offshoring could pose risks to government defense programs, critical infrastructure, and the protection of personal information.
- However, some believe offshoring may not pose major security risks.
- Underlying these disagreements are different predictions about the extent to which offshore operations inherently increase security risks, and the extent to which existing laws and practices mitigate the risks.

Source: GAO analysis.

Potential Impacts on the Average U.S. Standard of Living

Traditional economic theory on international trade predicts that offshoring is likely to be beneficial for the average U.S. standard of living in the long run; however, some economists have argued that offshoring could harm U.S. living standards. Economists who contend that offshoring will increase average U.S. living standards expect that it will do so through raising productivity (and thereby increasing national income), increasing average wages for American workers, and providing consumers with

lower prices and access to a broader range of goods and services.[15] In addition, they expect that U.S. companies will respond to the challenges of international competition by developing new areas of specialization in the global economy. Economists who argue that offshoring may lower U.S. average living standards focus on the possibility that offshoring may contribute to a decline in the strength of some U.S. industries and may threaten U.S. leadership in innovation and technological development. Some economists also focus on the possibility that offshoring may lead to downward pressure on U.S. wages even if it has positive effects on the U.S. economy overall. Underlying these disagreements are different predictions about what areas will emerge as new sources of comparative advantage in the global economy, as well as different assessments about whether offshoring is contributing to downward pressure on U.S. wages.

Traditional Economic Theory Predicts that Offshoring Will Benefit Average U.S. Living Standards in the Long Run

Effects on Productivity: Offshoring of services represents an expansion of trade into sectors of the economy that in the past were relatively untraded; as such, many economists we interviewed or who have published literature on offshoring expect offshoring to increase productivity in these sectors. Offshoring is expected to lead to productivity increases through several mechanisms. First, increased

[15]Productivity is a measure of the efficiency with which an economy uses its resources, often defined as increases in output per hour worked, and economists believe that productivity is key to long-term per-capita income and real wage growth. Labor productivity is defined as output per hour of labor worked and depends on (1) the skills (or "quality") of the workforce, (2) the amount and quality of the technology available to the workforce, and (3) additional factors such as the efficacy of management. Labor productivity is the most commonly used productivity measure. This measure is convenient for researchers because the Bureau of Labor Statistics (BLS) produces quarterly measures of labor productivity. A broader productivity measure that is sometimes used is multifactor productivity (MFP), also known as total factor productivity (TFP). The BLS produces two sets of MFP indexes. One multifactor productivity index, produced by the Major Sector Multifactor Productivity program, is produced for major sectors of the U.S. economy (private business and private non-farm business), the manufacturing sector in aggregate, and 20 2-digit Standard Industrial Classification (SIC) manufacturing industries and the utility and gas industries. The multifactor productivity indexes for the private business and private nonfarm business sectors measure output per combined unit of labor and capital input, while the multifactor productivity indexes for total manufacturing and for the 2-digit SIC manufacturing industries provide measures of sector output per combined unit of capital (K), labor (L), energy (E), materials (M), and purchased business services (S) inputs—called KLEMS inputs. A second multifactor productivity index, produced by the Industry Multifactor Productivity Program, is produced for 140 3-digit SIC manufacturing industries and the railroad transportation industry. The industry multifactor productivity measures are constructed in a manner similar to the manufacturing sector series. The sector multifactor productivity measures and the KLEMS multifactor productivity measures are available annually.

competition could lead to pressures for greater efficiency, causing least productive firms to exit the market so that firms that remain in the market are increasingly focused on managing for greatest productivity. Second, offshoring—like domestic outsourcing—could enable U.S. firms to specialize in the core functions in which they add the greatest value, while moving lower-value job functions out of the country. As U.S. firms reallocate resources toward higher-value activities, moving lower-value activities overseas, the U.S. economy overall could see productivity gains. Third, offshoring could enhance productivity by promoting reductions in the costs of technology and other inputs that improve the efficiency of business processes. For example, some economists have argued that offshoring of IT services will reduce the cost of these services, making IT-enabled products and services more affordable and leading to increased diffusion of productivity-enhancing technology throughout many industries.[16] For instance, the lower cost of offshored health-record transcription services might encourage more health care providers to keep digitized medical records, improving the efficiency and productivity of the health care industry.

Because the acceleration in services offshoring is a relatively recent phenomenon, empirical evidence about its effects on the productivity of the U.S. economy remains preliminary. However, the effects of offshoring in manufacturing have been observed over many years and can shed some light on the potential impact of services offshoring on U.S. productivity. A number of research studies suggest that offshore outsourcing contributed to productivity improvements in U.S. manufacturing. Catherine Mann, among others, has argued that offshoring in the production of computer hardware—along with domestic innovation—kept prices of new hardware low and thereby played a role in the deepening of IT investment

[16]IT-enabled services are broader than IT services. IT-enabled services are those services that have been transformed by information and communications technology, enabling them to be digitized, codified, and fragmented and therefore able to be undertaken at any distance from the core business and final customer. These services include those often associated with offshoring, including accounting, financial analysis, call-center services, architectural drafting, and health-record transcription, among other services activities. See Catherine L. Mann, "Offshore Outsourcing and the Globalization of U.S. Services: Why Now, How Important, and What Policy Implications," *The United States and the World Economy: Foreign Economic Policy for the Next Decade*, ed. C. Fred Bergsten and the Institute for International Economics (Washington, D.C.: Institute for International Economics, January 2005), 281-312.

throughout the U.S. during the 1980s and 1990s.[17] Since the mid-1990s, the U.S. has experienced a period of unusually rapid productivity growth, which many attribute to accelerating investment in IT and the rapid diffusion of new applications and uses that occurred in the 1980s and 1990s.[18]

New Areas of Comparative Advantage: Traditional economic theory also predicts that increased trade—including offshoring—will increase economic growth, and therefore average living standards in the long run, by driving the economy to develop new innovative and high-value areas of comparative advantage—that is, to specialize in the creation of high-value goods and services that are produced most efficiently in the U.S.[19] Although increased competition due to offshoring and other trade may lead to contraction of production and employment within some U.S. industries, trade is also expected to reallocate the resources of the U.S. economy to sectors that are comparatively more efficient, such that U.S. companies are expected to eventually develop new areas of comparative advantage in the global economy that will lead to continued economic growth. Some economists contend that advantages that the U.S. has over less developed countries, such as a relatively high-skilled workforce, abundance of capital, and well-developed financial markets and investment opportunities will enable the U.S. economy to specialize in higher-value work. In particular, they expect that offshoring will

[17]Catherine L. Mann, "Globalization of IT Services and White Collar Jobs: The Next Wave of Productivity Growth," *International Economics Policy Briefs* PB03-11 (Washington, D.C.: Institute for International Economics, December 2003). This paper has also received criticism for its methodology. See L. Josh Bivens, "Truth and Consequences of Offshoring: Recent Studies Overstate the Benefits and Ignore the Costs to American Workers," *Briefing Paper* #155 (Washington, D.C.: Economic Policy Institute, Aug. 2, 2005).

[18]For a summary of this literature, including references to both case studies and analyses based on aggregate data and industry and firm level data, see Kevin Stiroh, "Information Technology and the US Productivity Revival: A Review of the Evidence," *Business Economics* 37:1 (January 2002), 30-37. See also Erik Brynjolfsson and Lorin Hitt. "Beyond Computation: Information Technology, Organizational Transformation and Business Performance," *Journal of Economic Perspectives* 14:4 (fall 2000): 23-48.

[19]A country is said to have a comparative advantage in the production of a good or service if it can produce that good or service at a lower opportunity cost than another country. The opportunity cost of producing a particular good or service, say cloth, is defined as the amount of production of other goods and services that must be given up in order to produce one more unit of cloth. This concept should be distinguished from absolute advantage, which reflects the quantity of productive resources that must be used, rather than what other goods or services must be given up by using those productive resources to make cloth.

contribute to the reduction or elimination of certain lower-skilled occupations in the U.S., but lead to the creation of new jobs in occupations that require higher levels of skill, shifting U.S. production and the distribution of employment to fields with higher returns.[20]

Some empirical studies suggest that the U.S. economy has historically developed new high-value areas of comparative advantage as trade has increased. The process of the U.S. developing higher-value areas of comparative advantage as lower-value work is moved offshore has been observed over many years in some manufacturing industries. For example, in the semiconductor industry, assembly work that was originally conducted in the U.S. began to be moved offshore in the 1960s. Although this offshoring did lead to job losses in the U.S., economists Clair Brown and Greg Linden assert in their research that this movement also kept the U.S. semiconductor industry competitive and permitted the U.S. industry to specialize in higher-value work within the industry. According to Brown and Linden, as chip assembly moved offshore, U.S. firms specialized in higher-value fabrication work, and when fabrication work began to move offshore, U.S. firms specialized in design.[21] Offshoring of services has not been occurring long enough to observe the relationship between offshoring and the emergence of new areas of specialization; however, economists J. Bradford Jensen and Lori Kletzer have argued that recent data demonstrates that workers in industries and occupations that are more likely to be affected by international trade tend to have higher wages and higher skills than workers in "non-tradable" service sector jobs, which is consistent with the hypothesis that offshoring and globalization is

[20]Some economists have also argued that in the long-term as the economies of low-wage trading partners grow, the U.S. will benefit from the emergence of intra-industry trade with such trading partners. For example, see Jagdish Bhagwati, Arvind Panagariya, and T.N. Srinivasan, "The Muddles Over Outsourcing," *Journal of Economic Perspectives* 18:4 (Fall 2004): 93-114. Intra-industry trade occurs when a country imports and exports goods in the same industry (for example, passenger cars are exported and imported by both the U.S and Germany). In intra-industry trade, countries still benefit from trade, as the larger market created by trade permits economies of scale and consequent product differentiation. See also Roy J. Ruffin, "The Nature and Significance of Intra-Industry Trade," *Economic and Financial Review* (Dallas, Tex.: Federal Reserve Bank of Dallas, fourth quarter 1999).

[21]Clair Brown and Greg Linden, "Offshoring in the Semiconductor Industry: A Historical Perspective," *Berkeley-Doshisha Employment and Technology Working Paper* cwts-02-2005 (Berkeley, Calif.: University of California, Berkeley, 2005).

leading the U.S. economy to specialize in higher-value work.[22] Historical trends also suggest that openness to trade has increased the economy's aggregate output in the past. The U.S. economy has grown as trade has expanded, and internationally, there is some evidence that countries that are more open to trade typically experience faster growth than those that are more closed.[23]

Effects on Wages: Some economists also argue that offshoring could increase average living standards by contributing to growth in average real wages for U.S. workers, corresponding to offshoring's effects on productivity. Economic theory predicts that average real wages should typically rise with average productivity rates, as workers are compensated for producing more per hour of work. Wages are expected to move with productivity growth in the long run if the share of national income that accrues to workers versus the share that accrues to firms' profits and other income remains fairly constant. Historically, wage growth in the U.S. has broadly tracked productivity growth, although changes in wages and productivity may have diverged for periods of time (see fig. 4). During the post-World War II period, the share of national income spent on total compensation—wages and benefits—rose throughout the 1950s, 1960s, and 1970s, and has been fairly constant since 1980, averaging about 66 percent of national income, with the remainder accruing to corporate profits, proprietor's income, rental income, and net interest.[24] Since 1970, an increasing amount of total labor compensation has been spent on benefits rather than wages and salaries. In recent years—since the end of

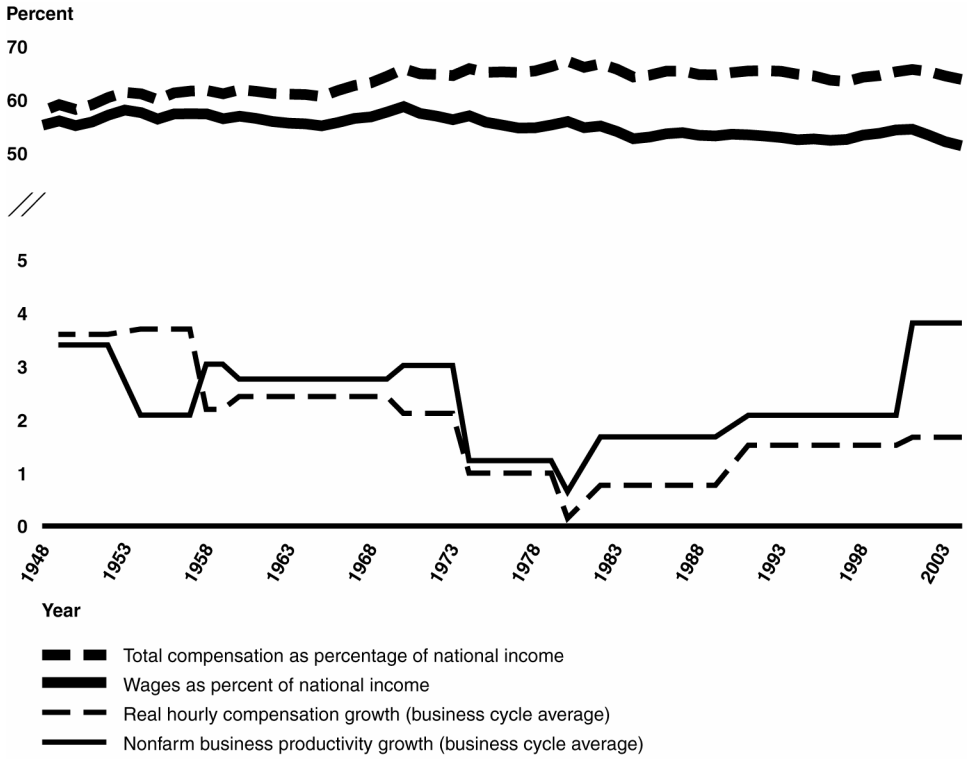
[22]J. Bradford Jensen and Lori G. Kletzer, "Tradable Services: Understanding the Scope and Impact of Services Offshoring" (July 14, 2005, forthcoming in *Brookings Trade Forum, 2005: Offshoring White-Collar Work—The Issues and the Implications*, Lael Brainard and Susan M. Collins, ed.).

[23]There is some consensus in the literature that openness to trade is positively correlated with economic growth. For a survey of this literature, see Andrew Berg and Anne Krueger, "Trade, Growth and Poverty: A Selective Survey," *IMF Working Paper* WP/03/30 (Washington, D.C.: International Monetary Fund, February 2003). However, there is also some disagreement. For an opposing view, see Francisco Rodriguez and Dani Rodrik, "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence," *NBER Working Paper* 7081 (Cambridge, Mass.: National Bureau of Economic Research, April 1999). Robert Baldwin also reviews this literature in "Openness and Growth: What's the Empirical Relationship?" *NBER Working Paper* 9578 (Cambridge, Mass.: National Bureau of Economic Research, March 2003).

[24]Proprietor's income is the income of noncorporate businesses. It is difficult to attribute to labor or capital. Some percentage of proprietor's income may be considered a wage paid by the business owner to themselves for their own labor, while some percentage may be considered a return on capital investment.

the 2001 recession—wages have not moved up with productivity growth, and total labor compensation as a share of national income has declined somewhat, from 66 percent in 2001 to 64 percent in 2004. During this time, wages and salaries as a share of national income declined from 55 percent in 2001 to 52 percent in 2004. Some economists have argued that this divergence of compensation growth from productivity growth is problematic and runs counter to assertions that increased productivity gains from offshoring will necessarily raise average living standards; however, this fluctuation is considered by other economists to fall within recent norms.

Figure 4: Real Hourly Wage Growth and Labor Productivity Growth, Wages, and Labor Compensation as a Share of National Income



Source: GAO calculations based on Bureau of Economic Analysis (National Economic Accounts) data and Bureau of Labor Statistics (productivity and hourly compensation) data.

Note: Total compensation includes wages and salaries, plus employers' contributions for employee pension and insurance funds and government social insurance. Productivity growth and hourly compensation growth are both obtained from the Bureau of Labor Statistics' (BLS) "Productivity and Costs" data series. Both of these measures are highly cyclical and have therefore been averaged over each business cycle (peak to peak) in order to more easily show trends over time. Productivity growth is seasonally adjusted nonfarm business output per hour. Hourly compensation includes wages and salaries of employees plus employers' contributions for social insurance and private benefit plans. Except for nonfinancial corporations, where there are no self-employed, data also include an estimate of wages, salaries, and supplemental payments for the self-employed. Hourly compensation growth is deflated in recent quarters based on the Consumer Price Index for all urban consumers (CPI-U). The trend from 1978-2004 is based on the Consumer Price Index research series (CPI-U-RS).

Effects on Prices and Availability of Consumer Goods and Services: Traditional economic theory also predicts that offshoring will improve average U.S. living standards by lowering consumer prices and providing consumers access to a wider range of goods and services than would otherwise be available. Many economists expect that competition will lead companies to pass the cost savings from offshoring onto consumers in the

form of lower prices. However, economic theory also predicts that the extent to which cost savings are passed onto consumers depends on how competitive the market is for particular goods and services. While firms in highly competitive markets are likely to pass most of the cost savings from offshoring through to the purchasers of the service, in less competitive markets, economic theory predicts that firms may retain some or all of the cost savings.[25]

Some Economists Have Argued That Offshoring Could Negatively Impact U.S. Living Standards

Although the most commonly cited economic trade theories predict that offshoring will likely have positive effects on the average U.S. living standard, some trade models generate scenarios under which the U.S. could lose either its absolute or relative position in the global economy, and some economists have argued that services offshoring is better described by these latter types of economic models.[26] Models in which the U.S. could face potential losses from increased trade such as offshoring reflect the possibility that as our trading partners become more productive in creating goods and services that the U.S. specializes in, the economic position of the U.S. could be undermined. For example, Ralph Gomory and William Baumol have described scenarios in which a trading partner experiences productivity improvements in an important U.S. export industry, resulting in declines in U.S. national income because U.S. firms lose their position as the most competitive producers in the industry.[27] The impact on the U.S. workforce, in this model, is particularly detrimental if the industry in which the U.S. is challenged is highly profitable and pays high wages, such as industries in which the U.S. has long held

[25]It should be noted that it is not always straightforward to determine the extent to which price declines can be attributed to the effects of trade. In part, this is because most traded products are manufactures and are generally subject to greater productivity growth (and hence steeper declines in costs) than nontraded products such as some services.

[26]A summary of trade models and their applicability to services offshoring can be found in James R. Markusen, "Modeling the Offshoring of White-Collar Services: From Comparative Advantage to the New Theories of Trade and FDI," (paper prepared for the Brookings Trade Forum 2005, Offshoring White-Collar Work: The Issues and the Implications, Washington, D.C., May 12-13, 2005).

[27]Ralph E. Gomory and William J. Baumol, *Global Trade and Conflicting National Interests* (Cambridge, Mass.: Massachusetts Institute of Technology, 2000).

technological superiority or an industry that is difficult to enter.[28] Other economists have developed different models in which productivity changes abroad lead to losses in the absolute or relative position of the U.S. in the global economy.[29] The negative results of increased trade in these models are not specific to offshoring—they could result from other forms of trade too, but they are sometimes cited when concerns about offshoring are raised because services offshoring raises the specter of the movement of high-value work from the U.S. to foreign trading partners.

Some have raised concerns that offshoring poses risks to U.S. leadership in innovation, particularly in high-value areas such as technology fields and research and development, raising the possibility that the global economic position of the U.S. could be eroded over time.[30] Economists and other offshoring observers have suggested a range of mechanisms through which offshoring could have a negative impact on U.S. innovation. Some argue that innovation results from solving technical problems during manufacturing, design, and research and development. To the extent that this work is conducted overseas, offshoring could promote faster technological diffusion to foreign firms, which may over time lead to foreign competitors coming to dominate an industry in which the U.S. was once the technological leader. Some contend that offshoring portions of the research and development infrastructure could threaten U.S. technological leadership by disrupting important innovation networks in the U.S., such as the IT cluster in Silicon Valley in California, or the biotechnology cluster in Cambridge, Massachusetts, and promoting the emergence of such networks abroad. In addition, some express concern that offshoring routine or entry-level work in some technical industries

[28]In other scenarios in Baumol and Gomory's model, the U.S. loses its relative position in the global economy as trading partners start to catch up with U.S. living standards, although in absolute terms productivity improvements abroad are beneficial for the U.S. standard of living. In general the detrimental impact on the U.S. predicted by these models does not result specifically from services offshoring but from any developments abroad that lead to foreign firms competing successfully with U.S. exports.

[29]Another paper that presents a theoretical example of this situation is Paul A. Samuelson, "Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization," *Journal of Economic Perspectives*, 18:3 (summer 2004): 135-146. See also Markusen, which summarizes several trade models in which productivity changes abroad lead to losses in the absolute or relative position of the U.S. in the global economy.

[30]See, for example, Ron Hira's testimony before the U.S. House Committee on Small Business, *The Globalization of White-Collar Jobs: Can America Lose These Jobs and Still Prosper?* 108th Congress (June 18, 2003).

could hurt the U.S.'s ability to maintain an innovative workforce by closing off career prospects for some U.S. workers and discouraging U.S. students from entering those fields.

Another concern raised by some economists is that offshoring could reduce average living standards for American workers by slowing the growth of average wages. These economists raise the concern that even if offshoring promotes economic growth and productivity, it could decrease labor's share of national income by subjecting American workers to direct competition with foreign workers, leading to slower growth or even a decline in average wages.[31] As we previously noted, recent statistics show a dip in the share of national income accruing to total worker compensation in recent years, and some economists believe that offshoring may be contributing to this trend.

Finally, some question whether firms will use the cost savings from offshoring in ways that lead immediately to the productivity improvements and consumer price reductions predicted by trade theory.[32] Under certain market conditions, an individual firm could retain supernormal profits (profits above the usual for their particular industry and product) for a period of time, distributing these gains to shareholders or their remaining employees, rather than passing on cost savings to consumers in the form of price reductions or investing their cost savings in productivity-enhancing reorganization or new technology. Although economic theory predicts that under many market conditions competitive forces will constrain the ability of firms to earn supernormal profits on an ongoing basis, the assumption that individual firms face perfectly competitive market conditions may not necessarily be accurate. Thus, some offshoring experts stress the importance of examining firm-level decisions to determine whether, how, and how quickly offshoring leads to price reductions and the reorganization of firms and industries toward specialization in higher-productivity activity.

Underlying the debate about the effects of offshoring on the average U.S. standard of living are different perspectives on the following questions:

[31]For example, see Economic Policy Institute, "Offshoring," *EPI Issue Guide*, www.epinet.org (June 2004, accessed on July 12, 2005).

[32]For example, see Bivens.

- What new areas of comparative advantage will the U.S. economy develop to compensate for declines, if any, in areas threatened by offshoring?
- How will offshoring affect average U.S. wages? Will the possible benefits of productivity gains offset the possible downward pressure exerted by increased exposure of U.S. workers to global competition?

Potential Impacts on Employment and Job Displacement

Many economists agree that offshoring is not likely to affect aggregate U.S. employment in the long run, but acknowledge that in the short run, workers will lose their jobs when employers relocate production abroad. At the same time, some economists have commented that offshoring may cause structural changes in the labor market because increased trade alters the mix of goods and services produced in the U.S. These structural changes could generate permanent changes in the types of work conducted by the U.S. labor force and could also possibly have longer-term effects on the U.S. unemployment rate. There is disagreement about the expected direction of any structural changes in the labor market due to offshoring, the expected magnitude of job displacement due to offshoring, and the implications of this displacement for those workers who are directly affected by it. Underlying these disagreements are different estimates about the projected extent of job losses due to offshoring, which types of jobs will be offshored, which areas of the economy will generate growth in job opportunites, and the re-employment experiences of workers whose jobs are offshored.

Many Economists Expect Offshoring to Have Little Effect on Long-Run Aggregate Employment, but Expect It to Have Effects on the Structure of Employment

Economic theory predicts that expansions in trade, including offshoring, typically should not affect the overall employment level (net employment) in the U.S. in the long run. Some economists argue that the U.S. labor market is generally expected to adjust quickly to changes in economic conditions because new jobs will be created as jobs are lost, and as a result, those who lose their jobs due to economic changes such as offshoring are expected to readily find new work. Given a flexible labor market, these economists theorize that the primary determinant of

fluctuations in the employment rate is aggregate demand in the overall economy, observed in the business cycle.[33]

Historically, the U.S. economy has rarely experienced unemployment rates higher than 10 percent of the labor force, with the exception of unique periods such as the Great Depression.[34] According to Bureau of Labor Statistics (BLS) data, since 1947, the civilian employment rate has increased gradually from around 59 percent in the 1940s and 1950s, to an average of 66 percent over the past 20 years.[35] During this period, the unemployment rate has generally fluctuated between about 4 percent to 8 percent, averaging 5.6 percent per year, even though the U.S. labor force has grown by, on average, 1.4 million people per year. Furthermore, the U.S. employment rate has not been correlated with trade or imports. While traded goods and services have increased from about 4 percent of the gross domestic product (GDP) to about 14 percent of GDP over the past 60 years, employment rates have steadily increased.[36] Even shocks to the percentage of the economy that is open to trade, such as the passage of major trade agreements, have not been correlated with significant changes in employment rates. Some have argued that while balanced trade may not affect employment levels, large and continued trade deficits put American jobs at risk. Historically, however, although employment in certain sectors

[33]Aggregate demand is the overall demand for output in the economy and reflects consumer and government spending as well as investment demand and net exports. These in turn are dependent on income, interest rates, investor and consumer confidence, and fiscal and monetary policy, among other things. It is thought that monetary policy, set by the Federal Reserve, can be used to stimulate aggregate demand during recessions so that the economy remains close to full employment. According to this view, while deviations from full-employment will occur in the short-run, in the long-run monetary policy can stabilize employment around the full-employment level.

[34]The unemployment rate (or civilian unemployment rate) is the number of U.S. civilians aged 16 and over who are in the labor force but not employed, divided by the number of U.S. civilians aged 16 and over who are in the labor force. The denominator *excludes* persons not in the labor market (those under 16; those not employed but not looking for work).

[35]The civilian employment rate (or employment to population ratio) is the number of U.S. civilians aged 16 and over who are employed, divided by the total number of civilians aged 16 and over in the population. The denominator *includes* persons not in the labor market (those not employed but not looking for work).

[36]Congressional Research Service, *Job Losses: Causes and Policy Implications*, RL32194 (Washington, D.C.: Dec. 22, 2004).

of the economy is sensitive to trade balances, there has been no evidence of a correlation between trade deficits and overall employment.[37]

Although there is dispute over the number of jobs likely to be lost due to offshoring in years to come, even the larger estimates generally represent a small enough fraction of the total number of jobs destroyed and created in the U.S. that many believe the U.S. labor market is likely to be able to absorb the change. For example, some private sector studies estimate that between 100,000 to 500,000 information technology jobs will be displaced over the next few years, and potentially several million jobs across all occupations could shift outside the U.S. over the next decade.[38] Several economists have pointed out that even the larger job loss estimates represent a relatively small percentage of the total number of jobs destroyed and created annually in the U.S. According to BLS statistics, since the end of the last recession in the fourth quarter of 2001, the U.S. has shed an average of 7.64 million jobs per quarter, while creating an average of 7.77 million jobs per quarter. Viewed in this context, some note that estimates of the number of jobs that could be lost due to offshoring do not appear to be as large of a shock to the economy. Moreover, some maintain that job losses due to offshoring should also be viewed in the context of the two-way flow of trade. Jobs are created as a result of U.S. firms exporting goods and services to other countries and foreign firms locating their production in the U.S. through direct foreign investment.

Although some economists argue that trade, including offshoring, is unlikely to affect long-term employment rates, others have noted that increases in offshoring and globalization could lead to changes in the structure of employment, which could lead to changes in the number of jobs available in different occupations and industries and could also potentially increase unemployment. Structural changes to employment

[37]Standard economic analysis predicts that trade deficits are not expected to generate unemployment. When the U.S. sustains a trade deficit, the U.S. is consuming goods and services of greater value than its GDP. This in turn means that other countries are necessarily supplying a net inflow of capital to the U.S., which permits the U.S. to pay for imports that exceed the value of its exports. The net capital inflow from foreign countries that accompanies a trade deficit is used in economic activities that generate jobs, such as direct investment in U.S. companies, or purchases of U.S. treasury debt which keeps U.S. interest rates low and thus stimulates domestic investment. The jobs generated by this net capital inflow should in theory offset the jobs that are lost when export industries decline. The BEA publishes a measure "Gross Domestic Purchases" that matches U.S. consumption of goods and services and can be compared to Gross Domestic Product.

[38]See GAO-04-932.

involve the permanent reallocation of workers and resources throughout the economy.[39] Offshoring could contribute to structural changes in employment by changing employers' demand for different skill-sets and occupations within certain industries. For example, offshoring could lead to substantial reductions in low-skilled IT-based services work while generating increases in high-skilled work such as IT systems management. It may take a long time for the economy to replace jobs lost to structural changes with new jobs because workers must switch industries, locations, or skills in order to find re-employment and because employers must create new jobs.[40] Although the workforce should eventually adjust to the structural changes in the economy, a significant structural change could potentially lead to an increase in unemployment in the meantime.[41]

Regardless of the impact of offshoring on aggregate employment and the unemployment rate, many economists acknowledge that offshoring and increased trade could produce structural changes that could generate permanent shifts within the U.S. labor market. Some economists believe these structural changes will lead to the U.S. workforce gaining better jobs overall, as U.S. businesses respond to offshoring and globalization by creating jobs in new areas of specialization that capitalize on the relatively highly skilled workforce and abundance of capital of the U.S. economy. For example, some note that while the U.S. has lost significant numbers of computer programming jobs, potentially due to offshoring, the U.S. economy at the same time has experienced an increase in the number of more sophisticated computer-related occupations, such as computer software engineers.[42] Other economists suggest that structural changes

[39]Erica L. Groshen and Simon Potter, "Has Structural Change Contributed to a Jobless Recovery?" *Current Issues in Economics and Finance* 9:8 (New York, N.Y.: Federal Reserve Bank of New York, August 2003).

[40]Cyclical job loss, in which jobs are temporarily suspended due to short-term declines in demand, leads to ready re-employment of laid-off workers in the same industry (and often the same job) when demand increases.

[41]Michael Klein, Scott Schuh and Robert Triest, "Job Creation, Job Destruction, and International Competition: A Literature Review," *Federal Reserve Bank of Boston Working Paper* 02-7 (Boston, Mass.: Federal Reserve Bank of Boston, December 2002) citing Carl Davidson, Lawrence Martin, and Steven Matusz, "Trade and Search Generated Unemployment," *Journal of International Economics* 48:2 (1999): 271-299.

[42]Martin Neil Baily and Robert Z. Lawrence, "What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring," *Brookings Papers on Economic Activity* 2 (2004): 211-284.

could lead to lower-quality jobs if the U.S. develops comparative advantage in areas that primarily produce low-skilled jobs.

Research has been done on the extent to which job gains and losses in recent years have resulted from structural changes in the economy; however, this research does not indicate whether the structural changes were due to offshoring. For example, in their study of the recent U.S. labor market, Erica Groshen and Simon Potter found evidence of structural change following the end of the 2001 recession, although they did not investigate whether offshoring was a cause of the structural change.[43]

There is Widespread Recognition That Offshoring Will Cause Some Job Displacement but Considerable Disagreement about the Expected Magnitude of This Problem

Although many economists believe that aggregate employment will not be significantly affected by offshoring, there is widespread recognition that offshoring may nevertheless displace at least some workers from their jobs, leading to adjustment costs incurred by these workers and their families as they seek re-employment. In other words, although net job loss due to offshoring may be minimal, with losses in some industries and occupations offset by employment growth in other areas, gross job losses due to offshoring could be significant.

Limited data make it difficult to draw conclusions about the current extent of job loss due to offshoring. The data limitations have led to conflicting claims, with some arguing that offshoring is a minor phenomenon and others arguing that it is being underestimated. For example, some cite data from the Mass Layoff Statistics (MLS) program produced by the Bureau of Labor Statistics, which showed that about 16,000 manufacturing and services job separations—less than 3 percent of the nonseasonal mass layoffs that took place in 2004—resulted from "movement of work" to locations outside the U.S. However, the MLS undercounts total job separations due to offshoring because it is designed to capture only mass layoffs, not total layoffs.[44] In contrast, others cite privately collected data that suggests that the extent of offshoring is much greater. For example,

[43]See Groshen and Potter.

[44]The MLS program does not collect statistics from small establishments—those employing fewer than 50 workers. In establishments employing 50 or more workers, MLS does not collect statistics on layoffs of less than 50 workers in a 5-week period. As a result, it collects data on only a portion of total layoffs. GAO previously reported that in 2003, the MLS survey covered only 4.6 percent of all U.S. establishments and 56.7 percent of all U.S. workers. In addition, MLS data is collected by employer self-report, and some employers may be unwilling to provide information when interviewed about reasons for layoffs. See GAO-04-932.

some have cited data collected by Kate Bronfenbrenner and Stephanie Luce, who attempted to measure the extent of offshoring with data collection from media reports and other sources. Extrapolating from a three month period, they estimate that as many as 406,000 manufacturing and services jobs were shifted from the U.S. to other countries in 2004.[45]

Although there is considerable uncertainty about the number of jobs that have been lost due to offshoring, a number of economists expect that offshoring is likely to expand in the future, both in absolute numbers and in types of work. For example, Cynthia Kroll has estimated that nearly 15 million people, or 12 percent of the employed labor force, are in white-collar occupations at risk to offshoring, though she notes that not all jobs in these occupations are likely to be offshored.[46] Private sector studies have also attempted to create forecasts of the effects of offshoring on employment in "at-risk" occupations; some of these studies project that between 100,000 and 500,000 IT jobs will be displaced within the next few years, and potentially several million jobs across all occupations will shift outside the U.S. over the next decade.[47] However, these studies face challenges in estimating the effects of offshoring because they are often based on federal statistics that currently provide limited information on the level and effects of offshoring.

Some economists have expressed concerns about the potential size of the dislocation costs for workers who lose their jobs due to offshoring, based in part on the experiences of manufacturing workers whose jobs were lost due to trade; others argue that the costs of displacement might not be as

[45]By searching media sources for evidence of job shifts from the U.S. to other countries and corroborating the information with company records, Kate Bronfenbrenner and Stephanie Luce identified 48,417 job losses due to offshoring that occurred between January and March 2004. The authors believe that this methodology underestimates the number of job losses from offshoring because media reports do not capture all job losses. On the assumption that media reports capture two-thirds of job shifts to Mexico and one-third of shifts to other countries, the authors estimate that as many as 406,000 jobs were shifted overseas in 2004. See Kate Bronfenbrenner and Stephanie Luce, *The Changing Nature of Corporate Global Restructuring: The Impact of Production Shifts on Jobs in the U.S., China, and around the Globe*, paper submitted to the U.S.-China Economic and Security Review Commission (Oct. 14, 2004). We did not assess the reliability of this or other studies that estimate the magnitude of job losses due to offshoring (see app. I).

[46]Cynthia Kroll, "State and Metropolitan Area Impacts of the Offshore Outsourcing of Business Services and IT," *Fisher Center Working Paper* 293 (Berkeley, Calif.: University of California, Berkeley, Fisher Center for Real Estate & Urban Economics, 2005).

[47]These studies are summarized in GAO-04-932.

large for services workers as they have been for manufacturing workers. Dislocation costs that workers could potentially experience include lost income during their period of unemployment and a lifetime of reduced wages if they cannot find a job that pays as much as the job they lost. Dislocation costs could be higher if job losses are concentrated in geographic areas because it may be difficult for the regional economy to absorb so many job seekers quickly and the local real estate market could be impacted.[48] Research on workers dislocated from jobs in manufacturing industries that faced import competition suggests that workers who lose their jobs due to trade-related employment changes tend to be less likely to find reemployment and to face larger income declines after job displacement than workers displaced from industries that are less trade-sensitive. However, some have raised questions about whether these results are applicable to trade-impacted services workers, who tend to have more desirable labor market characteristics than manufacturing workers. Research by J. Bradford Jensen and Lori Kletzer suggests that in recent years, services workers displaced from "tradable jobs"—jobs in industries and occupations likely to be affected by trade—had labor market advantages over those displaced from "non-tradable" service sector jobs and from manufacturing jobs, such as more education and higher predisplacement earnings.[49] Re-employment rates were slightly higher for displaced service sector workers in tradable jobs, compared to those in non-tradable jobs, and were significantly higher than the reemployment rates for displaced manufacturing workers. Earnings losses were significant for displaced services workers in tradable jobs, however. Of those re-employed, 55 percent experienced a decrease in earnings, with the average re-employed worker experiencing a 30 percent decline in earnings after reemployment. These large losses reflect the fact that displaced services workers in tradable jobs tended to have had relatively high wages prior to displacement.

Underlying the debate about the effects of offshoring on employment and job displacement are different perspectives on the following questions:

- Will offshoring contribute to structural changes in U.S. employment, and how will these changes affect aggregate employment levels and the type of occupations available to U.S. workers?

[48]See Kroll for a discussion of potential impacts of services offshoring on state and metropolitan areas.

[49]See Jensen and Kletzer.

- How many workers will be displaced due to offshoring?
- What are the reemployment experiences of workers dislocated due to offshoring?

Potential Impacts on the Distribution of Income

Some economists have expressed concern that offshoring could accelerate income inequality in the U.S.; however, others argue that changes in the income distribution are driven primarily by factors unrelated to offshoring, and still others point out that offshoring could potentially decrease income inequality. Those who think offshoring might accelerate income inequality believe it could do so by lowering the wages of some lower-wage and middle-class jobs, while potentially increasing the wages of smaller numbers of highly compensated positions. Those who disagree argue that offshoring is unlikely to have significant effects on wages and the U.S. income distribution because changes in demand for different skills are driven more by technological developments than by the changing international division of labor. Those who argue that offshoring could reduce income inequality note that this could occur if offshoring generates wage pressure on high-wage jobs, such as engineering, without significantly affecting the wages of low-wage jobs. Offshoring could also reduce income inequality if it reduces the cost of services that are consumed by primarily lower- and middle-income Americans. Underlying these disagreements are debates about whether, in the long run, offshoring will change the demand for U.S. workers with different skill levels, which sectors of the income distribution are most likely to be affected by this changing demand, and whether offshoring leads to reductions in the cost of services that primarily benefit lower- and middle-income Americans.

Some Economists Expect That Offshoring Could Affect the Distribution of Wage Income among U.S. Workers

Because offshoring is expected to have effects on the structure of employment within the national economy, it is expected to affect the distribution of income in the U.S.; however, experts hold differing views about the direction of these effects. Some contend that offshoring will increase income inequality and note several possible ways that it could do so. First, offshoring could increase income inequality if it primarily led to job losses or wage reductions among relatively low-income workers but had less of an effect on the jobs or wages of middle- and higher-income workers. Some offshoring observers argue that offshoring in the service sector has thus far primarily affected lower-wage jobs, such as call-center work and office support functions, rather than middle- or higher-income jobs. Second, some economists and policy analysts have expressed concern that offshoring could reduce wages at the middle of the income

distribution and lead to a "hollowing out" of the middle class if it is primarily middle-income jobs that are moved offshore or experience wage declines. For example, some economists and other policy analysts have noted that sophisticated and well-paid job functions, such as computer programming and radiology analysis, are increasingly susceptible to offshoring. In addition, some contend that offshoring will lead to increased inequality by contributing to income growth among those at the high-end of the income distribution. For example, an increase in corporate profits resulting from offshoring may promote growth in high-wage managerial positions and income accruing to business owners.

However, some economists contend that offshoring could also reduce income inequality if it leads to job losses or reduced wages among higher-wage occupations, such as engineering, without significantly affecting the jobs and wages of low-wage workers. In addition, some argue that offshoring could reduce inequality if it led to a decline in the wages, and consequently fees charged, by highly compensated workers who provide services to lower- and middle-income households. For example, if offshoring puts downward pressure on the wages of accountants, the resulting decrease in the cost of accounting services represents an increase in real wages for lower- and middle-income households who use these services, reducing inequality.

Trade theory can provide a rationale for those who have noted that offshoring could lead to increasing income inequality. One of the most commonly cited models, the Heckscher-Ohlin model, predicts that when the U.S. initiates or expands trade with a country that has a dissimilar workforce, such as a developing country, this trade is likely to have a negative effect on the distribution of wage income within the U.S.

workforce.[50] For example, when trade expands between the U.S., a country with a large pool of highly-skilled and educated workers, and a developing country with a large pool of less skilled and educated workers, this model generally predicts that the U.S. will specialize in those goods and services that are best produced by more skilled and educated workers, while the developing country will specialize in those goods and services best produced by less skilled and less educated workers. The implication of this international specialization for U.S. workers is that demand for skilled workers in the U.S. will grow, while demand for less skilled workers in the U.S. will shrink. As a result, wages for more skilled and educated U.S. workers will increase relative to the wages of less skilled and educated U.S. workers, thus increasing income inequality. However, to the extent that services offshoring involves the movement of higher-skilled work to developing countries, more complex versions of this model generate different predictions about income inequality in the U.S.—income inequality could decline if the demand for higher-skilled workers declines relative to the demand for lower-skilled workers.[51]

[50]The Heckscher-Ohlin (HO) model explicitly models the wage rate received by different factors of production in each trading partner. Different factors of production may refer to workers of different skill levels, such as college-educated versus high school-educated workers, or the model can be used to examine the impact of trade on the income earned by owners of capital compared to wage earners. An argument similar to that which explains increased income inequality between workers of different skill levels can explain why increased trade with a developing country is likely to increase the return to capital (i.e., corporate profits) relative to wage income in the U.S. A developing country is likely to have a larger workforce relative to the amount of capital stock (financial resources and physical capital) than the U.S. Therefore, simple trade theory models predict that as trade between the U.S. and a developing country increases, the developing country will specialize in goods and services that are more labor intensive, while the U.S. will specialize in goods and services that are more capital-intensive. These patterns of specialization imply that in the U.S., corporate profits as a share of national income may rise, while employee compensation as a share of national income may fall, as demand for capital in the U.S. grows.

[51]See Markusen. In addition, if the developing country does begin to compete in areas that employ higher-skilled and higher-paid U.S. workers, the factor-price equalization theorem predicts that income inequality in the U.S. would decline, due to falling relative wages among higher-skilled U.S. workers. A further caveat to the prediction that trade with a developing country is likely to increase income inequality in the U.S. that some economists have discussed is the potential for the emergence of intra-industry trade with developing country trading partners. These economists have argued that over time, as the economies of developing countries grow and become more similar to developed countries' economies, all trading partners will benefit from the emergence of intra-industry trade, where a country imports and exports goods in the same industry. Because intra-industry trade is not based on scarce and abundant factors of production, it is not expected to lead to large changes in the distribution of income within each country.

Although many economists agree that international trade, including offshoring, could have some impact on the distribution of income, some argue that these factors are not among the more important determinants of the U.S. income distribution. These economists argue that other factors are much more significant determinants of the changing U.S. income distribution. In particular, technological change is viewed by some economists as the primary determinant of the growing wage gap between more and less skilled workers. Many economists claim that as technological advances have occurred, particularly in computers and IT, requirements for technological skills for workers across a range of occupations have increased, requirements that often translate into increased demand for more educated workers. At the same time, technological advances have permitted some routine work to be automated, decreasing demand for less-skilled workers. Numerous studies have examined whether trade or technological change explained a larger share of the growing wage gap between more and less educated workers during the 1980s and 1990s, with the majority concluding that technological change was a more important determinant than trade.[52] On balance, these studies conclude that trade has made a small contribution to the increase in income inequality. Estimates suggest that trade explains between 10 and 20 percent of the increase in income inequality, with the majority of the increase attributable to other factors such as technological change that favors higher-skilled workers. However, the impact of services offshoring on income inequality has not been examined to the same extent that manufacturing trade has.

Underlying the debate about the effects of offshoring on U.S. income distribution are different perspectives on the following questions:

- What are the characteristics (occupation, skill level, and wages) of jobs that are moving offshore?
- What are the characteristics of jobs that are being created?
- Will offshoring reduce the cost of goods and services that are important consumption items for middle and lower income households?

[52]A summary of this literature is provided in Congressional Research Service, *Foreign Outsourcing: Economic Implications and Policy Responses*, RL32484 (Washington, D.C.: June 21, 2005).

Potential Impacts on Security

Experts express varying degrees of concern that offshoring could pose security risks, including increased risks to national security, critical infrastructure, and personal privacy. Underlying these disagreements are unresolved questions about the extent to which offshore operations pose additional risks than outsourcing services domestically and the extent to which U.S. laws and standards apply and are enforceable for work conducted offshore.

Some Concerns Have Been Raised That Offshoring May Pose Increased Risks to National Security and Critical Infrastructure, Though Some Experts Contend That Offshoring May Not Pose Additional Major Risks

Some security and offshoring experts, including the Department of Defense (DOD), have raised concerns that offshoring could pose increased risks to national security and critical infrastructure, but others believe that offshoring will not. National security concerns relate to government programs and systems involved in national defense, particularly military and intelligence operations. Critical infrastructure concerns relate to systems and structures owned by either government or private entities that are essential to the country, such as utilities, transportation, and communications networks.[53]

One concern raised by security experts is that offshoring the development of software used in defense systems could pose additional security risks, specifically, that foreign workers with hostile intentions could obtain critical information or introduce malicious code into software products that could interfere with defense or infrastructure systems. There are currently few explicit restrictions on the type of services work that can be sent offshore.[54] DOD's Defense Security Service has analyzed this issue and identified concerns with the potential exploitation of software developed in foreign research facilities and software companies for projects related to classified or sensitive programs.[55] We have reviewed

[53]Presidential Decision Directive/NSC-63 on Critical Infrastructure Protection defines critical infrastructure as "those physical and cyber-based systems essential to the minimum operations of the economy and government. They include, but are not limited to, telecommunications, energy, banking and finance, transportation, water systems, and emergency systems, both governmental and private."

[54]There are some restrictions in annual defense appropriations and authorization acts requiring certain DOD procurements to be performed by U.S. firms, for instance research contracts in connection with weapons systems and the Ballistic Missile Defense Program. See GAO, *Federal Procurement: International Agreements Result in Waivers of Some U.S. Domestic Source Restrictions*, GAO-05-188 (Washington, D.C.: Jan. 26, 2005); also Defense Federal Acquisition Regulation Supplement, Subpart 225.70.

[55]Defense Security Service, *Technology Collection Trends in the U.S. Defense Industry 2002* (Alexandria, Va.: 2002).

DOD's management of software developed overseas for defense weapons systems as well.[56] Our report noted that multiple requirements and guidance acknowledge the inherent risks associated with foreign access to classified or export-controlled information and technology and are intended to protect U.S. national security by managing such access. However, we found that DOD does not require program managers of major weapons systems to identify or manage the potential security risks from foreign suppliers. For instance, DOD guidance for program managers to review computer code from foreign sources not directly controlled by DOD or its contractors is not mandatory. In addition, DOD programs cannot always fully identify all foreign-developed software in their systems.

Private-sector groups and government officials have raised similar concerns about the added security risks posed by offshoring to U.S. non-military critical infrastructure, such as nuclear power plants, the electric power grid, transportation, or communications networks. For example, some have noted that sensitive but unclassified information, such as the plans of important U.S. utilities or transport networks, could be sent to foreign locations where it could be released improperly or made available to hostile foreign nationals. Other concerns relate to the offshoring of software development and maintenance. Software security experts in the public sector—including DOD and the Central Intelligence Agency—have expressed concern that organizations and individuals with hostile intentions, such as terrorist organizations and foreign government economic and information warfare units, could gain direct access to software code by infiltrating or otherwise influencing contractor and subcontractor staff, and then use this code to perpetrate attacks on U.S. infrastructure systems or conduct industrial or other forms of espionage. Security experts also note that critical infrastructure systems rely extensively on commercial off the shelf (COTS) software programs that are developed in locations around the world. These programs include exploitable vulnerabilities and potentially even malicious code that can allow indirect access to infrastructure systems to cause the systems to perform in unintended ways. Thus, some experts believe that ongoing use of COTS software modules, whether developed offshore or not, as well as offshoring of software-related services could increase the risk of

[56]GAO, *Defense Acquisitions: Knowledge of Software Suppliers Needed to Manage Risks*, GAO-04-678 (Washington, D.C.: May 25, 2004).

unauthorized access to critical infrastructure code in comparison to in-house development and maintenance of proprietary programs and code.

Security experts also express concerns about longer-term effects of offshoring. For instance, some note that continued offshoring of certain products might make the U.S. dependent on foreign operations for critical civilian or military products, and therefore vulnerable if relations between the U.S. and those countries become hostile. Another concern is the ability to control access to certain civilian technologies with military uses when work on these technologies takes place in foreign locations. Some fear that offshoring certain high-tech work may lead to the transfer of information and technology that could be used by foreign entities to match or counter current U.S. technical and military superiority. The U.S. can control exports of such dual-use technologies by requiring firms to obtain an export license from the Department of Commerce before they can be worked on in foreign locations or by foreign nationals. We have reviewed some aspects of this export licensing program and found key challenges to Commerce's primary mechanism for ensuring compliance with export licenses.[57]

Some representatives of business groups contend that offshoring may not pose major increased security concerns for a variety of reasons. Some believe that protections currently in place are adequate to manage the added risks posed by offshoring. Currently, the Department of Defense has mandatory procedures to safeguard classified information that is released to U.S. government contractors, and firms that offshore certain work related to military technologies are required to obtain export licenses from either the State or Commerce departments.[58] In addition, some argue that foreign workers in offshore locations do not necessarily pose added

[57]GAO, *Export Controls: Post-Shipment Verification Provides Limited Assurance That Dual-Use Items Are Being Properly Used*, GAO-04-357 (Washington, D.C.: Jan. 12, 2004). This GAO review did not look at controls over service inputs specifically but found weaknesses in Commerce's post-shipment verification checks for confirming that controlled items sent to countries of concern arrive at their proper location and are used in compliance with the conditions of export licenses.

[58]The State Department manages the regulation of defense articles and services, while the Commerce Department manages the regulation of dual-use items with both military and commercial applications. In most cases, Commerce's controls are less restrictive than State's. GAO has reviewed this export-control system, and found that Commerce has improperly classified some State-controlled items. See GAO, *Export Controls: Processes for Determining Proper Control of Defense-Related Items Need Improvement*, GAO-02-996 (Washington, D.C.: Sept. 20, 2002).

security risks, relative to U.S. workers in domestic outsourced operations, because domestic workers could also improperly handle information. Some foreign affairs experts also argue that offshoring could have positive effects on national security. They contend that increased international trade may reduce the threat of international tensions because countries with integrated economies have a stake in one another's well-being.

Concerns Have Been Raised about the Impact of Offshoring on Personal Privacy

Experts express varying degrees of concern about the impact offshoring may have on personal privacy when medical and financial records become accessible in overseas locations. Privacy advocates, academics, and offshoring researchers have noted concerns with the possibility that personal information sent to foreign locations could be improperly released, leading to identity theft, diversion of funds, and breaches of confidentiality. However, others note that the Gramm-Leach-Bliley Act, which covers the privacy of financial information, limits disclosure of personal information and requires financial institutions to protect the security and confidentiality of their customers' personal information through written agreements when information is sent to a third-party service provider. The privacy of medical information is covered under the Health Insurance Portability and Accountability Act Privacy Rule, which requires certain entities that hold medical records to receive satisfactory written assurance that any of their business associates will handle information appropriately. We are currently conducting work that examines offshoring of protected health information and related privacy issues.

Underlying the debate about the effects of offshoring on security are difference perspectives on the following questions:

- To what extent does offshoring pose added security risks?
- Do existing laws, regulations, and controls provide adequate protection from the added risks posed by offshoring that do exist?

A Wide Range of Policies Have Been Proposed to Address Concerns about Offshoring's Potential Impacts

Offshoring observers have proposed a broad range of policies in response to offshoring, representing a variety of different ideas about how public policies could address the concerns raised by offshoring. We have categorized these proposals into four types on the basis of concerns they seek to address: (1) improving U.S. global competitiveness, (2) addressing effects on the U.S. workforce, (3) addressing security concerns, and (4) reducing the extent of offshoring. Some analysts have proposed policies in more than one of these areas. On the other hand, it is also possible to take the position that services offshoring does not warrant any changes in government policies. While we indicate the rationales that have been presented for the various policy proposals, we do not evaluate the merits and drawbacks of these proposals. Relevant factors to consider in evaluating proposals would include the magnitude of the problems that policy proposals seek to address, likely effectiveness of the proposals, potential negative consequences, financial costs to government, and feasibility of administration.

Proposals to Improve the Competitiveness of the US Economy

Proponents of policies that seek to improve U.S. global competitiveness view offshoring as one aspect of much broader economic and trade issues and maintain that the debate should be focused on issues broader than the offshoring of work by companies headquartered in the U.S. They contend that the appropriate focus should be on the broader public policy issue of how the U.S. can continue to compete and attract high-paying jobs in a time of rapidly increasing trade and open global markets that allow multinational firms to hire labor from around the world. These proponents have articulated proposals that seek to help the U.S. economy develop new areas of specialization in response to increased foreign competition by fostering the types of industries and businesses that can succeed in a global economy and promote the creation of high-value jobs. In addition, some regard these proposals as important for promoting U.S. economic growth, regardless of the offshoring debate. Many of these proposals have been articulated as broad policy objectives, such as "fostering innovation" or "improving education" rather than as specific policy mechanisms to achieve these objectives. Suggestions for how to improve U.S. global competitiveness include proposals to promote innovation and creative industries, improve human capital and the skill level of the U.S. workforce, reduce the costs of doing business in the U.S., and establish trade practices that promote U.S. exports.

Promoting Innovation

Many economists and policy analysts have predicted that for the U.S. economy to successfully adjust to offshoring, it will need to develop and produce new, innovative goods and services that require and reward

higher levels of skill, and they believe that government actions can help to bring about this development. In addition, they point out that private companies can lack the incentives and time horizons to invest sufficiently in basic research—research undertaken without specific desired applications but that can lead to innovations. Some have also noted that federal funding for basic research has recently declined as a percentage of GDP and that foreign governments are increasing their research spending to improve their own economies' innovative capacity.[59] Policies that have been proposed to promote innovation include:

- Increasing government support for basic research and development projects.
- Making permanent the current research and development tax credit to encourage companies to increase their own spending. Currently, the tax system allows businesses to obtain a tax credit for certain spending on research and development, but this credit requires regular reauthorization, rather than being a permanent feature of the tax code.[60]
- Increasing government spending on particular forms of infrastructure and technology that can support innovation, such as broadband Internet connections.

Improving Workforce Skills

Many who emphasize the broad goal of improving U.S. competitiveness also support upgrading the nation's workforce skills and human capital by improving education, increasing opportunities for worker training, and reforming immigration policy. They contend that for the economy to move into higher-end, innovative products to replace job functions that have been offshored, more American workers will need to develop the knowledge and skills to perform complex, nonroutine work. In particular, they emphasize the importance of education programs in the science,

[59]The Congressional Research Service reports that the intensity of government-funded basic research has fallen from about 0.7% of GDP in 1953 to about 0.2% of GDP in 2002. See Congressional Research Service, RL 32484.

[60]In a review of the research and development tax credit, GAO concluded that the credit's net benefits to society are uncertain. Private sector studies concluded that during the 1980's each dollar of foregone tax revenue due to the credit resulted in a dollar of spending on research, but we raised questions about the methodologies of these studies. In addition, these studies did not examine the benefits gained by society from research stimulated by these credits or the costs to society from the collection of taxes required to fund the credits. See GAO, *Tax Policy and Administration: Review of Studies of the Effectiveness of the Research Tax Credit*, GAO/GGD-96-43 (Washington, D.C.: May 21, 1996).

technology, engineering, and mathematics fields.[61] In addition, some have noted that workers will increasingly need to upgrade their skills continually throughout their careers in order to adjust to rapid changes in the modern economy. As a result, many policies proposed in response to offshoring seek to increase the skill level of current and future generations of U.S. workers, including the following proposals:

- Improving K-12 education, with special attention on increasing achievement in math and science fields. Proponents of these policies argue that U.S. students demonstrate poor achievement in these subjects relative to students in other nations, bringing into question whether the U.S. will have an adequate supply of scientists and engineers to sustain a globally competitive and innovative economy.

- Expanding and improving lifelong learning through increased federal support of worker training and advanced adult education programs. One specific proposal is instituting "human capital tax credits" that could be offered either to businesses that spend money on worker training programs or to individuals who spend money on their own education. Such tax credits could partially offset the costs to business of training workers who may not stay with a company for long and the costs to workers of learning skills that may not guarantee long-term employment.

- Encouraging immigration of high-skilled workers. Proponents of these policies note that a large and growing segment of U.S. scientists and engineers are foreign-born. Specific proposals to increase the number of highly educated immigrants in the U.S. include raising the number of temporary work visas that allow high-skilled workers to enter the country and expediting the issuance of green cards for foreign graduates of U.S. universities.

Reducing Business Costs

Other proposals to improve competitiveness focus on ways to reduce the costs of doing business in the U.S. relative to other countries. Proponents of these policies note that cost reduction is a leading motive for businesses to offshore service-sector work and that higher costs can affect the ability of U.S. firms to compete against foreign firms in the global economy. Proposals to reduce business costs in the U.S. include:

[61]GAO recently examined federally-funded higher education programs in these fields. See GAO, *Higher Education: Federal Science, Technology, Engineering, and Mathematics Programs and Related Trends*, GAO-06-114 (Washington, D.C.: Oct. 12, 2005).

- Reducing federal taxes and regulatory requirements on businesses. Proponents of these policies argue that complex and high taxes and extensive regulations raise costs for companies to do business in the U.S. These proposals assume that taxes in foreign countries would remain unchanged, so that a decline in U.S. taxes would reduce the cost of doing business in the U.S. relative to the cost of doing business overseas, thus increasing incentives for companies to keep work in the U.S.

- Reducing costs to businesses of providing health care to employees. Proponents of these policies argue that high health care costs drive up the total cost of labor compensation for employers, although it is possible that increases in U.S. health care costs could be partially or fully offset by decreases in other components of labor compensation. Various approaches have been proposed to decrease health care costs, such as use of improved technology in the management of patient care, establishing association health plans that would allow small businesses greater leverage in negotiations with health insurance providers, and establishing a universal healthcare system.

Enhancing U.S. Exports

Another type of policy response to offshoring and increasing global interdependence focuses on expanding the market for U.S. exports. Proponents of these policies contend that several factors may be depressing U.S. exports and that more can be done to "level the playing field" of international trade. One concern is that while the U.S. has opened up its markets to foreign competition, some foreign governments have not opened certain of their markets, especially for services in which U.S. companies are globally competitive, such as financial services. Where trade agreements are in place, some have raised concerns that certain foreign governments may be violating them, such as by providing subsidies to their own industries or imposing nontariff barriers to their markets. A further concern that has been expressed is that some foreign governments may be artificially lowering the value of their currencies relative to the dollar so that their exports are relatively inexpensive, while U.S. exports

become relatively more expensive.[62] Policies that have been proposed to redress these concerns and enhance U.S. exports include the following:

- Continuing to negotiate trade agreements that will open foreign markets in which U.S. companies have export opportunities.

- Taking more aggressive actions to challenge foreign government actions that may violate existing trade agreements, such as bringing actions at the World Trade Organization (WTO) and imposing retaliatory measures allowed under WTO rules. Such violations could include foreign countries' tax incentives to U.S. companies that offshore or inadequate protection of intellectual property rights of U.S. imports, which harms the sales of U.S. products forced to compete with unlicensed versions.[63]

- Continuing to persuade countries that may have undervalued currencies to raise their currency values or to otherwise engineer a controlled decline in the value of the dollar.[64]

[62]The Department of the Treasury is required to assess annually whether foreign countries are manipulating their currencies for trade advantage. GAO examined the Treasury's process for making these assessments and reported that Treasury has not found that either China or Japan meet all legal criteria for currency manipulation. However, GAO also noted that many experts have concluded that China's currency is undervalued, though by widely varying amounts, and some maintain that undervaluation cannot be determined. See GAO, *International Trade: Treasury Assessments Have Not Found Currency Manipulation, but Concerns about Exchange Rates Continue*, GAO-05-351 (Washington, D.C.: Apr. 19, 2005).

[63]GAO has previously found that the U.S. government lacks a coordinated strategy to handle the growing workload involved in monitoring and enforcing trade agreements. See GAO, *International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements*, GAO-05-537 (Washington D.C.: June 30, 2005). More specifically, GAO has found limitations in the World Trade Organization's (WTO) intended mechanism to review China's compliance with its trade commitments and made recommendations for key agencies to improve their management of China's WTO compliance. See GAO, *U.S.-China Trade: Observations on Ensuring China's Compliance with World Trade Organization Commitments*, GAO-05-295T (Washington D.C.: Feb. 4, 2005).

[64]In a previous study, GAO concluded that a revaluation of the Chinese renminbi would have implications for various aspects of the U.S. economy—with both costs and benefits—although the impacts are hard to predict. See GAO-05-351.

Proposals to Assist Workers Affected by Offshoring

Proposals to address concerns about offshoring's effects on workers seek to reduce the costs borne by some individuals when an economy becomes increasingly open to foreign trade and competition. Many of these proposals would provide assistance to workers during their period of unemployment and to help them obtain new jobs. While some of these proposals put particularly strong emphasis on retraining displaced workers, not all observers agree that retraining policies would be effective. Other proposals would expand broad social insurance programs that would cover all workers and provide benefits to anyone who loses a job.

Assisting Displaced Workers in Transition to New Employment

Many proposals to help workers affected by offshoring focus on programs designed to help workers adjust to job losses and to facilitate their reemployment. These include the following proposals:

- Amending the Worker Adjustment and Retraining Notification (WARN) Act to increase the notice that employers must give employees from 60 to 90 days when offshoring will cause a mass layoff or plant closure.[65]

- Extending the Trade Adjustment Assistance (TAA) program to services workers. The TAA program provides extended unemployment benefits and subsidized training to workers involved in the production of articles who can demonstrate that they were displaced due to increased imports or shifts in production to foreign countries. It generally serves workers who have been laid off from the manufacturing sector.[66]

- Expanding or developing income support and reemployment programs that would assist displaced workers in general, not just those who meet TAA criteria. Several policy advocates and researchers who have studied offshoring have stated that existing government programs to serve displaced workers do not provide adequate protections or assistance for a changing economy in which global trade affects more workers. For instance, they have questioned the effectiveness of existing worker retraining programs or expressed doubts that retraining will be an effective response as international pressures begin to affect higher-skilled occupations and workers who already have advanced educations.

[65]Pub. L. No. 100-379; 29 U.S.C. § 2101-2109.

[66]Pub. L. No. 93-618; 19 U.S.C. § 2271.

- Establishing wage insurance, a program that would pay displaced workers who find reemployment at a lower wage a percentage of the difference between their previous and new earnings for a limited time. Proponents of wage insurance contend that it would provide incentives for dislocated workers to reenter the labor market quickly, even if they must do so at lower wages. In addition, proponents maintain that wage insurance could encourage workers to take jobs in unfamiliar fields where their inexperience commands lower wages, but where the job imparts new in-demand skills, and allow them to build new careers.[67]

Broader Reforms of Social Insurance Programs

Some have proposed broader reforms to strengthen the social safety net and mitigate some of the hardships generated by the economic insecurity associated with an increasingly integrated global economy. Proponents of these policies emphasize the need to accompany open trade policies with enhanced social protections for all workers who are increasingly exposed to risks by international competition, such as job loss, job insecurity, or downward wage pressure. In addition, proponents contend that government policies should compensate workers who bear the costs of trade-induced economic disruptions. Such proposals would potentially affect large segments of the population and would require extensive rethinking and redesign of U.S. social policy, but proponents maintain that they could increase public acceptance of open trade policies. Such proposals include the following:

- Making health and pension benefits portable and/or universal so that workers who lose their jobs can retain their access to medical care and retirement plans. Some favor the government's providing universal health care coverage, and others propose preserving or expanding portable or universal retirement coverage.

- Requiring employers that move jobs offshore to pay some of the costs for worker assistance programs. Proponents contend that government should play a role in redistributing some of the gains from offshoring to workers who have been negatively affected. Proponents believe that such proposals would serve this principle and could mitigate some concerns about offshoring's effects on income inequality.

[67]The Trade Act of 2002 that reformed the TAA program created a demonstration wage insurance benefit for workers 50 years of age and over in the TAA program who meet a series of criteria. Pub. L. No 107-210 § 124; 19 U.S.C. § 2318.

Proposals to Protect Security

Proposals to address concerns about security seek to reduce the added risk that information sent to foreign locations could be used in ways that could impair U.S. national security, critical infrastructure, or personal privacy. Proposals include restrictions on certain types of work with security implications and strengthening standards governing how information is handled.

Protecting National Security and Critical Infrastructure

Concerns that offshoring could pose increased risks to national security or critical infrastructure have led to proposals to restrict some services work from being sent to foreign locations or performed by foreign nationals and to improve security standards for work that is performed offshore, including the following proposals:

- Requiring that certain projects involving defense acquisitions or military equipment be performed exclusively in the U.S.
- Requiring that work on critical infrastructure projects such as electricity grids or pipelines be done within the U.S.
- Increasing the standards and review procedures that apply to use of offshore services. For example, GAO has previously recommended that DOD adopt more effective practices for developing software and increasing oversight of software-intensive systems, such as ensuring that risk assessments of weapons programs consider threats to software development from foreign suppliers.[68]

Protecting Personal Privacy

Concerns that offshoring could pose added risks to the privacy of personal information have led to a variety of proposals to enhance protections, including the following:

- Requiring companies to keep work involving sensitive private information in the U.S.
- Requiring companies to notify and obtain consent from U.S. residents before sending personal information to be processed in other countries.
- Ensuring that consumers have legal recourse against U.S. firms for privacy breaches by foreign contractors.

[68]See GAO-04-678.

- Strengthening U.S. laws and regulations concerning the handling of personal information, regardless of whether the data are handled domestically or overseas. Those who propose this option contend that U.S. laws and regulations do not provide adequate protections for personal information in general, regardless of where the information is handled.

Proposals to Reduce the Extent of Offshoring

Another type of policy that has been proposed to address the various concerns raised by offshoring focuses on reducing the extent of offshoring. Some of these policy proposals focus on offshoring by government agencies, while others seek to modify firms' incentives with respect to where they source their work.

Restricting Offshoring by Government Agencies

There have been numerous proposals to limit or constrain offshoring by federal and state governments, including the following examples:[69]

- Legislation proposed to prohibit federal work or federally funded work from being performed in foreign countries, unless the foreign goods or services are for use in that country.
- Legislation proposed to require contractors with the U.S. military and executive agencies to have at least 50 percent of their workforce in the U.S.
- Legislation proposed to prohibit the federal government from providing assistance to, or doing business with, companies that in the last 5 years offshored jobs previously performed in the U.S., unless the company also creates significant replacement jobs in the U.S.
- Legislation proposed in several states to restrict the procurement of state-funded services from overseas.

[69]We are examining the occurrence and nature of services offshoring in several government human services programs and the extent to which legal restrictions limit the ability to procure services from foreign locations. We have also examined impacts of legislation restraining imports. See, for example, GAO, *Maritime Issues: Assessment of the International Trade Commission's 1995 Analysis of the Economic Impact of the Jones Act*, B-279386 (Washington, D.C.: Mar. 6, 1998). This study examined legislation requiring that, with few exceptions, cargo transported by water between points in the U.S. be carried on U.S.-built, -registered, -owned, and -crewed ships.

- Proposals to prohibit government contracts from going to countries that have not signed trade agreements with the U.S. on non-discrimination in government procurement.

Modifying the U.S. Tax Code to Reduce Incentives for Offshoring

Another proposed means of reducing offshoring is to change tax policy to alter the relative costs of domestic versus foreign production. Many economists and policy analysts believe the current tax system provides incentives for U.S. multinational firms to locate work at their overseas affiliates because it allows them to defer taxes on profits earned on some activities in foreign countries until the profits are brought back to the U.S. However, some note that this tax treatment helps U.S.-owned businesses compete in foreign markets against foreign-owned businesses.[70] Proposals for changing the tax code include:

- Eliminating the ability of firms to defer foreign-earned income by taxing foreign profits at the same rate as domestic profits in the year they are earned. This proposal would affect only offshoring that takes place between U.S.-based multinational firms and their foreign affiliates. It would not affect offshoring that involves outsourcing work to separate firms located overseas.

- Establishing a value-added tax (VAT) system, in which a tax could be applied to products imported to the U.S. and rebated on products the U.S. exports. However, as GAO and others have reported, many economists believe that such border tax adjustments would not affect the trade balance in the long run because exchange rates would adjust to offset the border adjustments.[71]

Providing Incentives for Businesses to Locate Work in the U.S.

Other policy proposals would enhance incentives for firms to locate work domestically. Proponents of these policies note that foreign governments award incentives, such as providing buildings, infrastructure, and tax exemptions, to companies that export service products. In response, some

[70]Many countries do not tax the foreign-source income of their resident corporations. Consequently, in the absence of deferral, these foreign-based corporations would often have an advantage when competing against U.S.-owned subsidiaries operating in a third country.

[71]GAO, *Tax Administration: Potential Impact of Alternative Taxes on Taxpayers and Administrators*, GAO/GGD-98-37 (Washington, D.C.: Jan. 14, 1998); Congressional Research Service, *The Flat Tax, Value-Added Tax, and National Retail Sales Tax: Overview of the Issues*, RL32603 (Washington, D.C.: Dec. 14, 2004).

suggest that the U.S. provide similar incentives, including the following proposals:

- Providing tax reductions or subsidies to companies that employ domestic workers. One specific proposal is a tax credit for companies in certain industries identified as affected by offshoring that would cover the payroll taxes of newly hired employees.

- Providing federal assistance for regional economic development plans, including infrastructure improvements and grants targeted at attracting work that might otherwise be offshored.

Additional Research in Key Areas May Help Advance the Offshoring Debate

Determining appropriate policy responses to the offshoring phenomenon is challenging for several reasons. Services offshoring is a relatively recent phenomenon that raises a broad range of issues. No federal data series directly measure the extent of offshoring or its effects. Moreover, experts have expressed differing views about the potential impacts of offshoring. Nevertheless, there are some key areas where further research might help to provide more information about the impacts and policy implications of services offshoring. These areas include

- impacts of offshoring on various sectors of the U.S. economy, and especially the sectors that are emerging as new sources of comparative advantage;

- impacts of offshoring on the workforce, such as numbers of workers displaced and their reemployment experiences;

- impacts of offshoring on the U.S. income distribution, including trends in wage levels of jobs moving offshore; and

- any increased security-related risks posed by offshoring and the extent to which these are mitigated by current practices and laws.

Further research in these areas could help inform policy making by providing more information about the nature and magnitude of the benefits and costs resulting from offshoring. For example, research on whether offshoring is negatively impacting important sectors of the economy could help to inform the need for new policies to enhance U.S. competitiveness. Further information on the number of job losses resulting from offshoring as well as how workers fare in the labor market after their dislocations could help inform the need for new policies to

assist displaced workers and to target these policies appropriately. Research on how offshoring is affecting the distribution of income in the U.S. could help to inform policy makers whether new policies are needed to address income inequality. Research that examines whether offshoring increases risks to national security, critical infrastructure, and consumer privacy can help to inform policy makers whether there is a need for additional security protections. Finally, research in all of these areas may help to advance the debate about whether policies to reduce the extent of offshoring are warranted.

Researchers are conducting studies that can shed light on some of these areas. For example, some researchers have conducted case studies that examine the effects of offshoring in the semiconductor, call center, and radiology industries.[72] Among other issues, these studies examined the types of work that are conducted offshore and the types of work that are conducted in the U.S. In their study of the radiology industry, for instance, Frank Levy and Ari Goelman conclude that radiology work conducted overseas is unlikely to displace radiology work done in the U.S., noting that offshore work primarily consists of preliminary readings of radiological images conducted at night when few radiologists in the U.S. would be available. However, the radiology industry may not be comparable with other industries in which offshoring takes place. Other researchers have utilized statistical methods for analyzing existing data series. For example, Martin Baily and Robert Lawrence have used a variety of methods to analyze trade and employment data and examine offshoring's effects on unemployment.[73] In some instances, researchers may be able to apply statistical methods that were utilized in research on

[72]Rosemary Batt, Virginia Doellgast, and Hyunji Kwon, "A Comparison of Service Management and Employment Systems in U.S. and Indian Call Centers" and Frank Levy and Ari Goelman, "Offshoring and Radiology," (prepared for the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and the Implications, Washington, D.C., May 12-13, 2005); Clair Brown and Greg Linden, "Offshoring in the Semiconductor Industry: A Historical Perspective," *Berkeley-Doshisha Employment and Technology Working Paper Series* cwts-02-2005 (Berkeley, Calif.: University of California, Berkeley, 2005).

[73]Martin Baily and Robert Lawrence use data from U.S. and Indian trade statistics, as well as additional sources, to estimate the number of jobs lost due to offshoring in both the manufacturing and services sector between 2000 and 2003. Their results suggest that offshoring did not cause large enough job dislocations to be a significant source of unemployment in either services or manufacturing. See Martin Neil Baily and Robert Z. Lawrence, "What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring," *Brookings Papers on Economic Activity* 2 (2004): 211-284.

offshoring and trade in the manufacturing sector to conduct research on services offshoring.

There may also be opportunities to expand or improve current federal data series to obtain more information on this topic. For example, some have raised concerns that there is a significant discrepancy between data on the levels of services imports from India as reported by U.S. federal government sources and the data reported by India. In a review of BEA and Indian services data, we identified several factors that contributed to this discrepancy, such as differences in each country's definitions of trade in services. We also recommended ways in which BEA can further improve its services trade data.[74] Other examples of limitations of current databases identified by offshoring researchers are that data on services trade are not available at a sufficiently detailed industry level, trade data may not capture services that are bundled with goods or other services, and data on foreign affiliates of multinational corporations lack information on occupations of workers employed overseas.[75]

Table 1 illustrates some key areas where further research might contribute to a better understanding of the effects and policy implications of offshoring. The table identifies some pertinent data sources, though none of the sources can directly answer the research questions. Generally speaking, these data sources can provide information on a phenomenon, such as changes in employment in a given occupation or changes in the output produced by an industry, but they cannot provide information on the extent to which these changes resulted from offshoring. For example, BLS collects data on employment levels in various industries and occupations, but the data capture job losses and gains that occur for all reasons, not only because of offshoring. Table 1 also identifies some of the methodological approaches that have been, or could be, used in these areas of research. These include conducting in-depth studies of firms and industries and using statistical methods for analyzing existing data. Table 1 also highlights some potential challenges and limitations of the various approaches. For example, while in-depth studies of services offshoring in

[74]GAO, *International Trade: U.S. and India Data on Offshoring Show Significant Differences*, GAO-06-116 (Washington, D.C.: Oct. 27, 2005).

[75]See, for example, Brookings Institution, "Services Offshoring: What Do the Data Tell Us?" Summary of Data Workshop (Washington, D.C.: June 22, 2004); Office of Senator Joseph Lieberman, *Data Dearth in Offshore Outsourcing: Policymaking Requires Facts* (Washington, D.C.: December 2004).

particular industries may shed light on some dynamics of the offshoring phenomenon, their findings are not necessarily reflective of what is occurring nationally. Our overview of research questions, data sources, research methods, and limitations is not meant to be exhaustive. Researchers will continue to pose new questions and approaches to gain further insights into offshoring.

Table 1: Some Key Areas for Additional Research on Services Offshoring and Possible Approaches for This Research

Research question*: How are different sectors of the U.S. economy being affected by offshoring, and what sectors are emerging as new sources of comparative advantage?*	
Data sources	
Data are not available to directly measure offshoring's impacts on different sectors of the U.S. economy. However, several data series can shed light on the state of various industries and occupations: • Bureau of Economic Analysis (BEA) gross output data by industry. • Bureau of Labor Statistics (BLS) data on employment levels in various industries and occupations. BLS also makes projections of employment trends. • BLS labor and multifactor productivity data by industry. • Census Bureau's Economic Census provides detailed information on various industries, such as the specific products produced, number of firms, and size of firms. • Census' Longitudinal Business Database provides establishment-level data over time, including establishments' entry into the market and their exits. • Various private-sector organizations collect firm-level and industry data (e.g., Thomson Research, Datamonitor, Reed Electronics Group) and on investment flows by sector (e.g., TrimTabs Investment Research, AMG Data Services).	
Federal data series also provide information on the level and prices of U.S. services imports: • BEA data on trade in private services (both imports and exports). • BEA data on U.S. direct investment abroad and on foreign direct investment in the U.S. • BLS data on changes in the prices of traded nonmilitary goods and services, though data is available for only some types of services. (BLS is expanding this data series for services.)	
The National Science Foundation provides indicators of the state of innovation in the U.S. and other countries, such as: • The number of patents granted in the U.S. and other countries. • The number of science and engineering articles and citations attributable to U.S. and foreign authors. • The level of research and development spending in the U.S and other countries. • The number of science and technology degrees granted by U.S. and foreign universities.	
Methodological approaches	**Information these approaches could provide and potential limitations**
Case studies of firms and industries engaged in services offshoring: • Studies to date examine the types of business functions that are offshored, types that remain in the U.S., and implications of offshoring for innovation in the U.S. and other countries (e.g., Dossani & Kenney, 2004 firm-level studies; Brown & Linden, 2005 on the semiconductor industry; Levy & Goelman, 2005 on radiology). • Surveys of firms in industries engaged in offshoring (e.g., Batt, Doellgast, & Kwon, 2005 on the call center industry).	Provides in-depth information about particular firms and industries. Would not provide nationally generalizable information.

Statistical methods used to examine the effects of trade on manufacturing industries: • Statistical methods used to analyze the relationship between import competition and labor productivity in manufacturing industries (e.g., MacDonald, 1994). • Statistical methods using firm-level data to determine the extent to which comparative advantage shifts in industries in response to trade. These studies examine changes in productivity levels, firms' entry and exit rates, and likelihood of switching industries (e.g., Bernard & Jensen, 2001; Bernard, Jensen & Schott, 2003, 2004).	Provides national-level information on relationships between trade and economic trends. May be challenging to isolate the impacts of offshoring from other factors. Data used for the manufacturing studies may not be available for services. Statistical methods may require a longer time series than is available as of yet for services. Questions have been raised about the reliability of data on services trade.
Forecasts of offshoring's effects on productivity and GDP: • Estimates of the effects of offshoring-related price declines for IT and other services on productivity and GDP growth (e.g., Mann, 2005). • Macroeconomic models, based on assumptions, such as the amount of offshoring that is likely to occur and the average cost savings to firms from offshoring (e.g., Global Insight, 2004; Baily & Lawrence, 2004).	Predicts offshoring's future economic effects. Forecasts rely on assumptions that may not accurately reflect actual circumstances.
Tracking industries and occupations in which job gains are occurring.	Indicates areas that may be emerging as sources of comparative advantage. Would not provide information on how these trends are related to offshoring.
Tracking various indicators of innovation in the U.S. and the rest of the world (both in absolute and relative terms).	Provides an indication of whether the U.S. economy is likely to continue to develop high-value areas. Would not provide information on how these trends are related to offshoring.

Research question: ***To what extent is offshoring affecting employment in the U.S.?***
Data sources
Data are not available to directly measure the number of job losses resulting from services offshoring. However, several data series provide information on employment trends in various industries and occupations:[a] • BLS' Mass Layoff Statistics (MLS) provides limited information on numbers of job losses due to overseas relocation. The MLS includes only mass layoffs.[b] • Several BLS data series provide information on employment levels by industry and occupation. The Business Employment Dynamics provides data on gross job gains and losses by industry.
The Displaced Workers Survey (DWS), a supplement to the Current Population Survey, can be used to estimate the number of workers displaced over a three-year period.

BEA data on US multinational corporations provide information on the number of jobs at foreign affiliates of U.S. companies, at U.S. parent companies, and at U.S. companies that are owned by foreigners.	
Methodological approaches	**Information these approaches could provide and potential limitations**
Examining employment trends in industries and occupations associated with services offshoring (e.g., GAO, 2004; Kirkegaard).	Provides information on job losses and gains in various industries and occupations. Would not provide information on how these trends are related to offshoring.
Tracking offshoring events from media reports and company records (e.g., Bronfenbrenner & Luce, 2004).	Indicates the magnitude of job losses due to offshoring. May not capture all job losses because not all layoffs are covered by the media. Firms' layoff announcements as reported by the media may not accurately reflect actual job losses.
Using foreign countries' data on job creation in offshored services (e.g., Baily & Lawrence, 2004, using India data).	Provides an estimate of an upper bound of possible job losses due to offshoring. Would not indicate actual job losses.
Statistical methods, such as those used in manufacturing studies, to analyze the relationship between trade and employment levels or job losses (e.g., Baily & Lawrence, 2004; Jensen & Kletzer, 2005; Klein, Schuh, & Triest, 2002).	Provides national-level information on relationships between trade and employment trends. May be challenging to isolate the impacts of offshoring from other factors. Data used for the manufacturing studies may not be available for services (see above).
Forecasts of job losses based on surveys of U.S. firms and statistical methods (e.g., Forrester, 2002 by McCarthy).	Predicts the number of job losses that offshoring may cause in the future. Forecasts rely on assumptions that may not accurately reflect actual circumstances.

Research question: ***What are the reemployment experiences of workers dislocated due to services offshoring?***

Data sources

Data are not available to directly provide information on workers dislocated due to offshoring, but data series provide information on the dislocated worker population:

- The Displaced Workers Survey (DWS) provides information on characteristics and experiences of displaced workers, including the duration of their unemployment, whether they were reemployed and, if so, their wages at reemployment
- Longitudinal data sets such as the National Longitudinal Surveys (NLS) and the Panel Study of Income Dynamics (PSID) provide information about the labor market experiences of workers over time.

Methodological approaches	**Information these approaches could provide and potential limitations**
Statistical methods to identify workers in the DWS in industries or occupations associated with trade. Such studies have examined these workers' reemployment rates, wages at reemployment, and demographic characteristics (e.g., Jensen & Kletzer, 2005).	Provides information on the experiences of dislocated workers in industries associated with offshoring. Would not specifically identify workers dislocated due to offshoring.

Case studies of layoffs have been done in manufacturing industries to obtain in-depth information about workers' experiences after displacement, including their displacement costs, coping strategies, and use of government-provided services (e.g., Bale & Mutti, 1978; Ong & Mar, 1992; Leana, Feldman, & Tan, 1998).	Provides in-depth information on the experiences of workers dislocated due to offshoring. Would not be generalizable to the larger population of workers dislocated due to offshoring.

Research question: ***What are the wages and skill levels of services jobs that are offshored?***	
Data sources	
Data are generally not available to directly provide information on the types of jobs that have been offshored, but several data series provide information on wages of workers in various industries and occupations: • BLS provides data on earnings and wages for various industries and occupations. • BLS and Census' Longitudinal Employer-Household Dynamics Program (LEHD) provides linked data on firms' actions (such as layoffs and outsourcing) and worker outcomes (such as duration of unemployment, re-employment, and wages) over time.	
Methodological approaches	**Information these approaches could provide and potential limitations**
Identifying industries and occupations that are thought to be at higher risk for offshoring, then assessing their skill levels and using BLS data to determine their wage levels (e.g., Bardhan & Kroll, 2003; Kirkegaard; Jensen & Kletzer, 2005).	Provides information on the characteristics of jobs in industries and occupations associated with offshoring. Would not identify wages and skill levels of jobs that have actually been offshored.
Case studies of firms and industries engaged in offshoring to examine the types of work that are offshored within an industry and types of work that remain in the U.S. (e.g., Dossani & Kenney, 2004; Brown & Linden, 2005; Batt, Doellgast, & Kwon, 2005).	Provides in-depth information on the types of jobs that have been lost due to offshoring in particular firms and industries. Would not provide nationally generalizable information.
Analysis of the LEHD to examine the wages and skill levels of some workers whose jobs are outsourced by U.S. employers.	Provides information on the characteristics of jobs that have been outsourced. Would not necessarily provide information on jobs that have been offshored.

Research question: ***To what extent is offshoring affecting the distribution of income in the U.S.?***	
Data sources	
Data are not available to directly measure the effects of offshoring on income distribution, but data series can shed light on the distribution of income in the U.S: • The Annual Demographic Survey (March supplement to the Current Population Survey) provides annual data on family and household income. • The Federal Reserve Board's Survey of Consumer Finances (SCF) provides triennial data on the wealth, income, and demographics of U.S. families. • BLS data series provide information on earnings and wages for various industries and occupations. • BEA data on national economic accounts provides information on the amount of national income accruing to employee compensation compared to profits and capital expenditures.	
Methodological approaches	**Information these approaches could provide and potential limitations**
Measuring the U.S. income and wealth distribution in various ways, such as the percentages of total income accounted for by each quintile of U.S. households.	Provides information on income distribution trends in the U.S. Would not provide information about how these trends are related to offshoring.
Tracking the percentage of national income that accrues to employee compensation compared to the percentage that accrues to profits and capital expenditures.	Provides information on income distribution trends in the U.S. Would not provide information about how these trends are related to offshoring.
Statistical methods have been used in manufacturing studies to examine the relationship between trade and income distribution. These studies examined how the wages earned by workers at different levels of education are related to changes in international trade, and attempt to determine how much of the wage gap between more and less educated workers is due to trade and how much is due to technology (e.g, Collins, 1998). • The "factor content of trade" approach uses data on trade flows of goods and services, along with information about the levels of skill required for the production of such goods and services. • The "Heckscher–Ohlin" approach uses data on the prices of imports and exports, along with information about the levels of skill required for the production of such goods and services.	Provides national-level information on the relationships between trade and income inequality. May be challenging to isolate the impacts of offshoring from other factors. Data used for the manufacturing studies may not be available for services (see above).

In-depth studies of firms to determine how firms spend the cost savings they gain due to offshoring (e.g., whether firms use the savings to increase profits and shareholder value, to reduce prices, to increase wages among remaining employees, etc.).	Provides information on which groups receive increased income as a result of offshoring. Would examine only short-term economic decisions and may not reflect long-term impacts of offshoring.

Research question: ***What additional security risks, if any, does services offshoring pose, and to what extent do existing laws, regulations, and practices mitigate the risks?***	
Data sources	
No available data series measure the extent and nature of sensitive information sent to foreign locations by U.S. government contractors and other companies. However, the government collects data on some topics that could be relevant: • Intelligence reports on international efforts to obtain access to U.S. technologies or security systems. • Defense Department security surveys of foreign government security laws, regulations, and procedures for protecting classified information. • Applications for export licenses from firms that export technologies or employ foreign nationals who work with certain technologies.	
Methodological approaches	**Information these approaches could provide and potential limitations**
Detailed risk assessments in specific industries that examine the level of threats, vulnerabilities, and potential negative impacts associated with the offshoring of services: • Studies of industries that examine the types of information being sent to other countries and the extent to which firms abide by laws, regulations, or best practices intended to protect security. • Surveys of firms in specific industries (e.g., GAO, forthcoming, survey of contractors to federal healthcare agencies on offshoring and related privacy issues).	Provides information on security risks due to offshoring in specific industries. May be difficult to track firms' outsourcing of data to third party contractors and sub-contractors. May be challenging to obtain firm cooperation.

Source: GAO analysis.

[a]For a more detailed discussion of data sources on employment trends, see GAO-04-932.

[b]The Mass Layoff Statistics program identifies only a portion of total layoffs because it does not include small establishments or layoffs involving fewer than 50 employees.

Concluding Observations

Services offshoring is likely to remain an important public policy issue for years to come. The extent of offshoring could increase in the future as technology advances, U.S. firms become more adept at offshoring, and other countries continue to improve their abilities to provide services for the global economy. Because the services offshoring phenomenon is relatively new, little is known about its effects on the U.S. economy and society. Due to limited data and empirical research thus far, the debate about offshoring has largely been theoretical in nature. Policy makers and analysts face data challenges as they seek to assess the wide range of

policies that have been proposed in response to offshoring. In making these assessments, they may consider various relevant factors, such as the magnitude of the problems that policy proposals seek to address, likely effectiveness of the proposals, potential negative consequences, financial costs to government, and feasibility of administration.

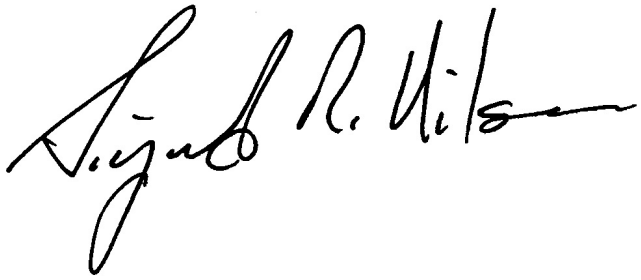
As the offshoring phenomenon continues, researchers in both the public and private sectors are likely to conduct more studies and collect more data that will provide a clearer understanding of offshoring and its effects. We have highlighted some key areas where further research might help advance the debate about the impacts and policy implications of offshoring. While such research faces numerous challenges and limitations, it offers some prospect for additional insights on diverse aspects of services offshoring.

Agency Comments

We provided a draft of this report to the Departments of Commerce, Labor, Treasury, and the Office of the United States Trade Representative. We received written comments from Commerce, which are reprinted in appendix III. Commerce stated that it appreciated the thoroughness of our review and that the report will be a useful reference starting point for discussions of the causes and impacts of offshoring. Commerce also stated that offshoring may raise living standards for the average American and affect fewer workers than the headlines seem to indicate, but that all of us must be troubled when any American workers lose their jobs, for whatever reason. Commerce added that the most powerful remedy for this problem is a growing economy that can ensure every American who wants a job is able to find one. Commerce, Treasury, and the Office of the U.S. Trade Representative provided technical comments, and we modified the report as appropriate to address these comments. The Department of Labor did not have comments.

Copies of this report are being sent to the Departments of Commerce, Labor, and Treasury; the Office of the U.S. Trade Representative; appropriate congressional committees; and other interested parties. Copies will be made available to others upon request. The report is also available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions about matters discussed in this report, please contact me at (202) 512-7215 or at nilsens@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Other contacts and staff acknowledgments are listed in appendix IV.



Sigurd R. Nilsen
Director, Education, Workforce,
and Income Security Issues

List of Committees

The Honorable Ted Stevens
Chairman
The Honorable Daniel K. Inouye
Ranking Minority Member
Committee on Commerce, Science,
and Transportation
United States Senate

The Honorable Charles E. Grassley
Chairman
The Honorable Max Baucus
Ranking Minority Member
Committee on Finance
United States Senate

The Honorable Michael B. Enzi
Chairman
The Honorable Edward M. Kennedy
Ranking Minority Member
Committee on Health, Education, Labor,
and Pensions
United States Senate

The Honorable John A. Boehner
Chairman
The Honorable George Miller
Ranking Minority Member
Committee on Education and
the Workforce
House of Representatives

The Honorable Joe Barton
Chairman
The Honorable John D. Dingell
Ranking Minority Member
Committee on Energy and Commerce
House of Representatives

The Honorable William B. Thomas
Chairman
The Honorable Charles B. Rangel
Ranking Minority Member
Committee on Ways and Means
House of Representatives

Appendix I: Scope and Methodology

Our objectives in this study were to: (1) describe experts' views about the potential effects of services offshoring on the U.S. economy, workforce, national security, and consumer privacy; (2) describe the types of policies that have been proposed in response to offshoring; and (3) discuss areas where further research could advance the debate on offshoring. Our methodology consisted of an extensive literature review and interviews of selected experts. In addition, we attended several conferences on services offshoring during the course of our work. We conducted our work from May 2004 to November 2005 in accordance with generally accepted government auditing standards.

We reviewed literature on services offshoring produced by academic experts, think tanks, business groups, labor groups, and government agencies such as the Congressional Research Service. Our literature review built upon work conducted under previous GAO studies of services offshoring.[1] We collected additional literature by reviewing research databases such as Econlit and Proquest and through general Internet searches. We also conducted targeted searches of the literature produced by various think tanks, interest groups, and other government agencies. In addition, we were referred to literature through citations in other literature, through media accounts, and by experts we interviewed. Through the course of our work, we sought to obtain a diverse body of literature that described various views on the potential effects of services offshoring and policy proposals. For studies summarizing empirical research findings, GAO reviewed these studies solely to describe the views of various experts on the effects of offshoring and the research methodologies they used. The inclusion of studies in this report does not imply that we deem them definitive or that the evidence presented in them is conclusive. Additionally some of these studies contain estimates of job losses due to offshoring of services that are of undetermined reliability. These estimates are presented for illustrative purposes and should not be considered in the same manner as the official government data on employment and trade discussed in the report. See the bibliography for a list of key literature reviewed for this report.

We interviewed experts from government agencies, academia, think tanks, and organizations representing business and labor interests. We met with

[1]We relied particularly upon literature collected for GAO, *International Trade: Current Government Data Provide Limited Insight into Offshoring of Services*, GAO-04-932 (Washington, D.C.: Sept. 22, 2004).

government officials at the departments of Commerce, Labor, and Treasury, and at the Office of the U.S. Trade Representative because each of these agencies analyzes issues related to offshoring. We selected other experts to interview based upon literature they published related to the offshoring phenomenon and through referrals by other experts. We strove to obtain a balance of views among the experts we interviewed. In addition to interviewing experts, we also reviewed interviews conducted for other GAO work on services offshoring. See appendix II for a list of experts interviewed for this report.

We also attended several conferences related to services offshoring to obtain further viewpoints on this topic, including conferences organized by the Brookings Institution, William Davidson Institute at the University of Michigan Business School, CATO Institute, Labor and Worklife Program at Harvard Law School and the North American Alliance for Fair Employment, Stanford Business School's Sloan Masters Program and World Affairs Council of Northern California, Asia-Pacific Research Center at Stanford University, and the Bernard and Audre Rapoport Center for Human Rights and Justice of the University of Texas School of Law.

Appendix II: List of Experts Interviewed

Jodie Allen
Senior Editor
Pew Research Center

Robert Atkinson
Vice President & Director
Technology & New Economy Project
Progressive Policy Institute

Ashok Bardhan
Senior Research Associate
Fisher Center for Real Estate & Urban Economics, Haas School of Business, University of California Berkeley

William Baumol
Professor of Economics
New York University

Jagdish Bhagwati
Professor of Economics
Columbia University

Josh Bivens
Trade Economist
Economic Policy Institute

Susan Collins
Senior Fellow, Economic Studies
The Brookings Institution

Ralph Gomory
President
Alfred P. Sloan Foundation

Ron Hira
Assistant Professor of Public Policy
Rochester Institute of Technology and
Vice President for Career Activities, Institute of Electrical and Electronics Engineers-USA

Josh James
Manager of Research
American Electronics Association

Matthew Kazmierczak
Director of Research
American Electronics Association

Martin Kenney
Professor of Human and Community Development
University of California Davis

Lori Kletzer
Professor of Economics
University of California, Santa Cruz

Cynthia Kroll
Senior Regional Economist
Fisher Center for Real Estate & Urban Economics, Haas School of Business, University of California Berkeley

Jeff Lande
Senior Vice President
Information Technology Association of America

Robert Lawrence
Professor of International Trade and Investment
Center for Business & Government, John F. Kennedy School of Government, Harvard University

Thea Lee
Assistant Director for International Economics
AFL-CIO

Robert Litan
Senior Fellow
Economic Studies
The Brookings Institution

Catherine Mann
Senior Fellow
Institute for International Economics

Lee Price
Research Director
Economic Policy Institute

Robert Reich
Professor of Social and Economic Policy
Brandeis University

Dani Rodrik
Professor of International Political Economy
John F. Kennedy School of Government, Harvard University

Enrique Sanchez
Director
Bank of America (retired)

Robert Scott
Director of International Programs
Economic Policy Institute

Diane Swonk
Chief Economist
Mesirow Financial

Appendix III: Comments from the Department of Commerce

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for Economic Affairs
Washington, D.C. 20230

NOV 04 2005

Sigurd R. Nilsen
Director
Education, Workforce and Income Security Issues
U.S. General Accountability Office
Washington, DC 20548

Dear Mr. Nilsen:

Thank you for the opportunity to review and comment on the GAO draft report "Offshoring of Services: An Overview of the Issues." As your report indicates, there is a great deal of debate over the relative importance of offshoring and about its benefits to the U.S. economy.

Offshoring may affect fewer workers than the headlines seem to indicate, and it may raise living standards for the average American. But all of us must be troubled when any American workers lose their jobs, whatever the reason. The most powerful remedy for this problem is a growing economy that can ensure every American who wants a job is able to find one. The economy's recent impressive job growth is surely the best answer of all to concerns about offshsoring.

We appreciate the thoroughness of your review of this debate. By defining the terms of that debate, this report will be a useful reference starting point for discussions of the causes and impact of offshoring. I enclose the U.S. Department of Commerce's recommended changes regarding factual or technical information.

Sincerely,

Keith Hall

Enclosure

Appendix IV: GAO Contacts and Staff Acknowledgments

GAO Contacts

Sigurd R. Nilsen, (202) 512-7215, nilsens@gao.gov

Staff Acknowledgments

In addition to the contact named above, Andrew Sherrill, Assistant Director; Yunsian Tai and Katrina Ryan, Analysts in Charge; Rhiannon Patterson; Eric Wenner; Margaret Armen; Lawrance Evans, Jr.; and Tovah Rom made significant contributions to this report.

GAO Related Products

Defense Acquisitions: *Knowledge of Software Suppliers Needed to Manage Risks*. GAO-04-678. Washington, D.C.: May 25, 2004.

Defense Trade: Better Information Needed to Support Decisions Affecting Proposed Weapons Transfers. GAO-03-694. Washington, D.C.: July 11, 2003.

Export Controls: Post-Shipment Verification Provides Limited Assurance That Dual-Use Items Are Being Properly Used. GAO-04-357. Washington, D.C.: January 12, 2004.

Export Controls: Processes for Determining Proper Control of Defense-Related Items Need Improvement. GAO-02-996. Washington, D.C.: September 20, 2002.

Federal Procurement: International Agreements Result in Waivers of Some U.S. Domestic Source Restrictions. GAO-05-188. Washington, D.C.: January 26, 2005.

Higher Education: Federal Science, Technology, Engineering, and Mathematics Programs and Related Trends. GAO-06-114. Washington, D.C.: October 12, 2005.

Highlights of a GAO Forum: Workforce Challenges and Opportunities for the 21st Century: Changing Labor Force Dynamics and the Role of Government Policies. GAO-04-845SP. Washington, D.C.: June 2004.

Industrial Security: DOD Cannot Ensure Its Oversight of Contractors under Foreign Influence Is Sufficient. GAO-05-681. Washington, D.C.: July 15, 2005.

International Trade: Current Government Data Provide Limited Insight into Offshoring of Services. GAO-04-932. Washington, D.C.: September 22, 2004.

International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements. GAO-05-537. Washington D.C. June 30, 2005.

International Trade: Treasury Assessments Have Not Found Currency Manipulation, but Concerns about Exchange Rates Continue. GAO-05-351. Washington, D.C.: April 19, 2005.

International Trade: U.S. and India Data on Offshoring Show Significant Differences. GAO-06-116. Washington, D.C.: October 27, 2005.

Tax Policy and Administration: Review of Studies of the Effectiveness of the Research Tax Credit. GAO/GGD-96-43. Washington, D.C.: May 21, 1996.

Trade Adjustment Assistance: Reforms Have Accelerated Training Enrollment, but Implementation Challenges Remain. GAO-04-1012. Washington, D.C.: September 22, 2004.

The Worker Adjustment and Retraining Notification Act: Revising the Act and Educational Materials Could Clarify Employer Responsibilities and Employee Rights. GAO-03-1003. Washington, D.C.: September 19, 2003.

Bibliography

American Electronics Association. *Offshore Outsourcing in an Increasingly Competitive and Rapidly Changing World: A High-Tech Perspective*. Washington, D.C.: March 2004.

Amiti, Mary and Shang-Jin Wei. "Fear of Service Outsourcing: Is It Justified?" *IMF Working Paper* WP/04/186. Washington, D.C.: International Monetary Fund, October 2004.

Antras, Pol, Luis Garicano, and Esteban Rossi-Hansberg. "Offshoring in a Knowledge Economy." *NBER Working Paper* 11094. Cambridge, Mass.: National Bureau of Economic Research, January 2005.

Aron, Ravi and Ying Liu. "A Study of Operational Risk in Off-Shore Outsourcing of Information Work: Evidence from Field Research." *Working Paper* OPIM-2005-05-06. Philadelphia, Pa.: The Wharton School, University of Pennsylvania.

Arora, Ashish and Alfonso Gambardella. "The Globalization of the Software Industry: Perspectives and Opportunities for Developed and Developing Countries." *NBER Working Paper* 10538. Cambridge, Mass.: National Bureau of Economic Research, June 2004.

Atkinson, Robert. "Meeting the Offshoring Challenge." *Policy Report*. Washington, D.C.: Progressive Policy Institute, July 2004.

Atkinson, Robert. "Understanding the Offshoring Challenge." *Policy Report*. Washington, D.C.: Progressive Policy Institute, May 2004.

Baily, Martin Neil and Robert Z. Lawrence. "What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring." *Brookings Papers on Economic Activity* 2 (2004): 211-284.

Bajpai, Nirupam, Jeffrey Sachs, Rohit Arora, and Harpreet Khurana. "Global Services Sourcing: Issues of Cost and Quality." *Center on Globalization and Sustainable Development Working Paper Series* 16. New York, N.Y.: The Earth Institute at Columbia University, June 2004.

Bale, Malcolm D. and John H. Mutti. "Income Losses, Compensation, and International Trade." *The Journal of Human Resources* 13:2 (spring 1978): 278-285.

Bardhan, Ashok D. and Cynthia Kroll. "The New Wave of Outsourcing." *Fisher Center Research Reports* 1103. Berkeley, Calif.: University of

California, Berkeley, Fisher Center for Real Estate and Urban Economics, fall 2003.

Bardhan, Ashok D. and Dwight M. Jaffee. "Innovation, R&D and Offshoring." *Fisher Center Research Reports* 1005. Berkeley, Calif.: University of California, Berkeley, Fisher Center for Real Estate and Urban Economics, fall 2005.

Batt, Rosemary, Virginia Doellgast, and Hyunji Kwon. "A Comparison of Service Management and Employment Systems in U.S. and Indian Call Centers." Paper prepared for the Brookings Trade Forum: Offshoring White-Collar Work—The Issues and the Implications, Washington, D.C., May 12-13 2005.

Berg, Andrew and Anne Krueger. "Trade, Growth and Poverty: A Selective Survey." *IMF Working Paper* WP/03/30. Washington, D.C.: International Monetary Fund, February 2003.

Bergsten, C. Fred and the Institute for International Economics. *The United States and the World Economy: Foreign Economic Policy for the Next Decade*. Washington, D.C.: Institute for International Economics, January 2005.

Bernard, Andrew B. and J. Bradford Jensen. "Who Dies? International Trade, Market Structure, and Industrial Restructuring." *NBER Working Paper* 8327. Cambridge, Mass.: National Bureau of Economic Research, June 2001.

Bernard Andrew B., J. Bradford Jensen, and Peter K. Schott. "Falling Trade Costs, Heterogeneous Firms, and Industry Dynamics." *NBER Working Paper* 9639. Cambridge, Mass.: National Bureau of Economic Research, April 2003.

Bernard Andrew B., J. Bradford Jensen, and Peter K. Schott. "Survival of the Best Fit: Exposure to Low-Wage Countries and the (Uneven) Growth of U.S. Manufacturing Plants." November 2004. http://mba.tuck.dartmouth.edu/pages/faculty/andrew.bernard/working_papers.html. (accessed on Apr. 27, 2005).

Bhagwati, Jagdish, Arvind Panagariya, and T.N. Srinivasan. "The Muddles Over Outsourcing." *Journal of Economic Perspectives* 18:4 (fall 2004): 93-114.

Bivens, L. Josh. "Truth and Consequences of Offshoring: Recent Studies Overstate the Benefits and Ignore the Costs to American Workers." *Briefing Paper* 155. Washington, D.C.: Economic Policy Institute, August 2, 2005.

The Boston Consulting Group. *Capturing Global Advantage: How Leading Industrial Companies are Transforming Their Industries by Sourcing and Selling in China, India, and Other Low-Cost Countries*. Boston, Mass.: April 2004.

Brainard, Lael and Robert E. Litan. "'Offshoring' Service Jobs: Bane or Boon—and What to Do?" *The Brookings Institution Policy Brief* 132. Washington, D.C.: The Brookings Institution, April 2004.

Bronfenbrenner, Kate and Stephanie Luce. "The Changing Nature of Corporate Global Restructuring: The Impact of Production Shifts on Jobs in the U.S., China, and around the Globe." Paper submitted to the *U.S.-China Economic and Security Review Commission*. October 14, 2004.

The Brookings Institution. "Offshoring and Privacy: Consumer Data in the Global Economy." Transcript from a Brookings Briefing. Washington, D.C., April 8, 2005.

The Brookings Institution. "Preparing America to Compete Globally: A Forum on Offshoring." Transcript from a Brookings Briefing. Washington, D.C., March 3, 2004.

The Brookings Institution. "Services Offshoring: What Do the Data Tell Us?" Summary of Data Workshop. Washington, D.C., June 22, 2004.

Brown, Clair and Greg Linden. "Offshoring in the Semiconductor Industry: A Historical Perspective." *Berkeley-Doshisha Employment and Technology Working Paper Series* cwts-02-2005. Berkeley, Calif.: University of California, Berkeley, 2005.

Brynjolfsson, Erik and Lorin M. Hitt. "Beyond Computation: Information Technology, Organizational Transformation and Business Performance." *Journal of Economic Perspectives* 14:4 (fall 2000): 23-48.

Business Roundtable. *Securing Growth and Jobs: Improving U.S. Prosperity in a Worldwide Economy*. March 2004.

Center for American Progress. *Offshoring and the Global Economy: A Progressive Agenda*. October 2004.

Collins, Susan M., ed. *Imports, Exports, and the American Worker*. Washington, D.C.: The Brookings Institution Press, 1998.

Congressional Research Service. *Deindustrialization of the U.S. Economy: The Roles of Trade, Productivity, and Recession*. RL32350. Washington, D.C.: April 15, 2004.

Congressional Research Service. *Financial Services Industry Outsourcing and Enforcement of Privacy Laws*. RS21809. Washington, D.C.: June 9, 2004.

Congressional Research Service. *The Flat Tax, Value-Added Tax, and National Retail Sales Tax: Overview of the Issues*. RL32603. Washington, D.C.: December 14, 2004.

Congressional Research Service. *Foreign Outsourcing: Economic Implications and Policy Responses*. RL32484. Washington, DC: June 21, 2005.

Congressional Research Service. *Job Loss: Causes and Policy Implications*. RL32194. Washington, D.C.: December 22, 2004.

Congressional Research Service. *Manufacturing Output, Productivity, and Employment: Implications for U.S. Policy*. RL32179. Washington, D.C.: January 29, 2004.

Congressional Research Service. *Offshoring (a.k.a. Offshore Outsourcing) and Job Insecurity Among U.S. Workers*. RL32292. Washington, D.C.: May 2, 2005.

Congressional Research Service. *The U.S. Trade Deficit: Causes, Consequences, and Cures*. RL31032. Washington, D.C.: July 13, 2005.

Davidson, Carl, Lawrence Martin, and Steven Matusz. "Trade and Search Generated Unemployment." *Journal of International Economics* 48:2 (1999): 271-299 .

Defense Security Service. *Technology Collection Trends in the U.S. Defense Industry*. Alexandria Va.: 2002.

Deloitte Touche Tohmatsu. *Making the Off-Shore Call: The Road Map for Communications Operator*s. 2004.

Dossani, Rafiq and Martin Kenney. "Offshoring: Determinants of the Location and Value of Services." Briefing Paper for Sloan Workshop Series in Industry Studies, Stanford University, August 13, 2004.

Dossani, Rafiq and Martin Kenney. "Went for Cost, Stayed for Quality? Moving the Back Office to India." *Berkeley Roundtable on the International Economy Paper* BRIEWP156. Berkeley, Calif.: University of California, Berkeley, 2003.

Economic Policy Institute. "Offshoring." *EPI Issue Guide*. June 2004. http://www.epinet.org (accessed on July 12, 2005).

Eischen, Kyle. "Working Through Outsourcing: Software Practice, Industry Organization, and Industry Evolution in India." *Center for Global International & Regional Studies Working Paper Series*. WP 2004-4. Santa Cruz, Calif.: University of California, Santa Cruz, 2004.

Forrester Research, Inc. *3.3 Million U.S. Services Jobs to Go Offshore*. November 11, 2002.

Garner, C. Alan. "Offshoring in the Service Sector: Economic Impact and Policy Issues." *Economic Review*. Kansas, City, Mo.: Federal Reserve Bank of Kansas City (third quarter, 2004): 5-37.

Global Insight (USA), Inc. *The Impact of Offshore IT Software and Services Outsourcing on the U.S. Economy and the IT Industry*. Lexington, Mass.: March 2004.

Gomory, Ralph E. and William J. Baumol. *Global Trade and Conflicting National Interests*. Cambridge, Mass.: MIT Press, 2000.

Groshen, Erica L. and Simon Potter, "Has Structural Change Contributed to a Jobless Recovery?" C*urrent Issues in Economics and Finance*. 9:8. New York, N.Y.: Federal Reserve Bank of New York, August 2003.

Haveman, Jon D. and Howard J. Shatz. "Services Offshoring: Background and Implications for California." Occasional Paper. San Francisco, Calif.: Public Policy Institute of California, August 25, 2004.

Institute of Electrical and Electronics Engineers. "Position on Offshore Outsourcing." March 2004. http://www.ieeeusa.org/forum/positions/offshoring.html. (accessed Aug. 4, 2004).

Jensen, J. Bradford and Lori G. Kletzer. "Tradable Services: Understanding the Scope and Impact of Services Offshoring," July 14, 2005. Forthcoming in *Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and the Implications*, Lael Brainard and Susan M. Collins, ed.

Kane, Timothy, Brett D. Schaefer, and Alison Fraser. "Myths and Realities: The False Crisis of Outsourcing." *Backgrounder*. 1757. Washington, D.C.: Heritage Foundation, May 13, 2004.

Kirkegaard, Jacob F. *Outsourcing—Stains on the White Collar?* Institute for International Economics.

Klein, Michael W., Scott Schuh and Robert K. Triest. "Job Creation, Job Destruction, and International Competition: A Literature Review." Working Paper 02-7. Boston, Mass.: Federal Reserve Bank of Boston, December 2002.

Klinger, Shannon and M. Lynn Sykes. *Exporting the Law: A Legal Analysis of State and Federal Outsourcing Legislation*. Arlington, Va.: National Foundation for American Policy, April 2004.

Kroll, Cynthia A. "State and Metropolitan Area Impacts of the Offshore Outsourcing of Business Services and IT." Fisher Center Working Paper 293. Berkeley, Calif.: University of California, Berkeley, Fisher Center for Real Estate & Urban Economics, 2005.

Leana, Carrie R., Daniel C. Feldman, and Gilbert Y. Tan. "Predictors of Coping Behavior after a Layoff." *Journal of Organizational Behavior* 19:1 (January 1998): 85-97.

Lindsey, Brink. "Job Losses and Trade: A Reality Check." Trade Briefing Paper 19. Washington, D.C.: CATO Institute, March 17, 2004.

MacDonald, James M. "Does Import Competition Force Efficient Production?" *The Review of Economics and Statistics* 76:4. (November 1994): 721-727.

Mann, Catherine L. "Globalization of IT Services and White Collar Jobs: The Next Wave of Productivity Growth." *International Economics Policy Briefs* PB03-11. Washington, D.C.: Institute for International Economics, December 2003.

Mann, Catherine L. "Offshore Outsourcing and the Globalization of US Services: Why Now, How Important, and What Policy Implications." In *The United States and the World Economy: Foreign Economic Policy for the Next Decade*. Washington, D.C.: Institute for International Economics, January 2005.

Mann, Catherine L. "This is Bangalore Calling: Hang Up or Speed Dial? What Technology-Enabled International Trade in Services Means for the U.S. Economy and Workforce." Cleveland, Ohio: Federal Reserve Bank of Cleveland, January 15, 2005.

Markusen, James R. "Modeling the Offshoring of White-Collar Services: From Comparative Advantage to the New Theories of Trade and FDI." Paper prepared for the Brookings Trade Forum: Offshoring White-Collar Work—The Issues and the Implications, Washington, D.C., May 12-13, 2005.

McKinsey Global Institute. *Offshoring: Is It a Win-Win Game?* San Francisco, Calif.: August 2003.

neoIT. "The Effect of Data Privacy & Security Regulations on Services Globalization." *Offshore Insights White Paper Series* 2:9. San Ramon, Calif.: September 2004.

neoIT. "Research Summary: Offshore & Nearshore ITO Salary Report 2004." *Offshore Insights Market Reports Series* 3:5. San Ramon, Calif.: May 2005.

Office of Senator Joseph I. Lieberman. *Data Dearth in Offshore Outsourcing: Policymaking Requires Facts.* Washington, D.C.: December 2004.

Office of Senator Joseph I. Lieberman. *Offshore Outsourcing and America's Competitive Edge: Losing Out in the High Technology R&D and Services Sectors*. Washington, D.C.: May 11, 2004.

Ong, Paul M. and Don Mar. "Post-Layoff Earnings Among Semiconductor Workers." *Industrial and Labor Relations Review* 45:2 (January 1992): 366-379.

Parry, Robert T. "Globalization: Threat or Opportunity for the U.S. Economy?" *FRBSF Economic Letter* 2004-12. San Francisco, Calif.: Federal Reserve Board of San Francisco, May 21, 2004.

Public Citizen's Global Trade Watch. *Addressing the Regulatory Vacuum: Policy Considerations Regarding Public and Private Sector Service Job Offshoring*. Product ID E9012. Washington, D.C. April 2004.

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

Republican Policy Committee. *Outsourcing: Meeting the Challenges Without Destroying the Benefits*. Washington, D.C.: March 3, 2004.

Rodriguez, Francisco and Dani Rodrik. "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence." *NBER Working Paper* 7081. Cambridge, Mass.: National Bureau of Economic Research, April 1999.

Ruffin, Roy J. "The Nature and Significance of Intra-Industry Trade." *Economic and Financial Review*. Dallas, Tex.: Federal Reserve Bank of Dallas, fourth quarter 1999.

Samuelson, Paul A. "Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization." *Journal of Economic Perspectives* 18:3 (summer 2004): 135-146.

Schultze, Charles L. "Offshoring, Import Competition, and the Jobless Recovery." *The Brookings Institution Policy Brief* 136. Washington, D.C.: The Brookings Institution, August 2004.

Seshasai, Satwik and Amar Gupta. "Global Outsourcing of Professional Services." *Working Paper* 4456-04. Cambridge, Mass.: MIT Sloan School of Management, January 2004.

Stiroh, Kevin J. "Information Technology and the U.S. Productivity Revival: A Review of the Evidence." *Business Economics* 37:1 (January 2002): 30-37.

United Nations Conference on Trade and Development. *World Investment Report 2004: The Shift Towards Services*. New York and Geneva: 2004.

U.S. Chamber of Commerce. *Jobs, Trade, Sourcing, and the Future of the American Workforce*. Washington, D.C.: April 2004.

U.S. House of Representatives Small Business Committee. *The Globalization of White-Collar Jobs: Can America Lose These Jobs and Still Prosper?* Testimony before full committee. Washington, D.C.: June 18, 2003.

White & Case. *The Debate Over Outsourcing in the United States: A Real Threat to Job Growth or an Evolution of Free Trade?* Washington, D.C.: March 15, 2004.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are $2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm
E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Paul Anderson, Managing Director, AndersonP1@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548

PRINTED ON RECYCLED PAPER