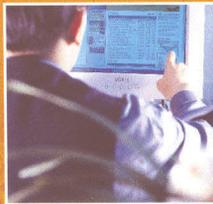


A Report by a Panel of the

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION

for the U.S. Congress and the Bureau of Economic Analysis

OFF-SHORING: *An Elusive Phenomenon*



January 2006

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PUBLIC ADMINISTRATION



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The views expressed in this report are those of the Panel. They do not necessarily reflect the views of the Academy as an institution.

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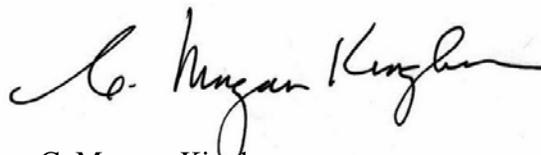
FOREWORD

Off-shoring business operations is a difficult, elusive and exceedingly complex phenomenon. It produces myriad and widespread economic impacts, with U.S. employment and workers' earnings being among the most sensitive. Concerns about off-shoring are not new. For decades they have been central to the debate over the benefits and costs of economic growth and trade expansion. What distinguishes off-shoring concerns today is the focus on the services sector, particularly white collar, high-technology jobs previously considered less vulnerable to migration overseas.

There is little consensus about off-shoring. The disparity and intensity of viewpoints stem from many factors. They include the lack of a commonly accepted definition; differences in how the phenomenon has been reviewed; varied reliability of data and their use; the wide range of potential entities affected; and the inherent difficulty in directly measuring off-shoring and estimating its impacts. Indeed, recent studies have cited the need for better data to understand the extent and economic effects of off-shoring.

This is the first of several reports by an Academy Panel formed to assess off-shoring, including the adequacy of current data and their usefulness in ascertaining its extent and economic effects. The Panel finds that the use of multiple terms to describe off-shoring has hindered a meaningful understanding of this phenomenon. It recommends simplifying the discussion by focusing on three basic terms: "outsourcing," "off-shoring" and "off-shore outsourcing." It also recommends a broad definition for off-shoring to avoid the pitfalls of narrow definitions that create ambiguity over particular activities stemming from artificial distinctions or changes over time.

I want to thank the Panel for its thoughtful and insightful report that provides a better understanding of the difficulty in identifying off-shoring activities and estimating its economic effects, especially the impact on jobs and worker incomes. Let me also commend the project staff for their efforts to assimilate and review the extensive literature and to develop analyses that support the Panel's work to date. Finally, I want to thank Congress, particularly Chairman Frank Wolf, the Bureau of Economic Analysis, Bureau of Labor Statistics and Bureau of the Census for the opportunity to examine this important issue and for their support and cooperation in this endeavor.



C. Morgan Kinghorn
President

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ACRONYMS

AFL-CIO	American Federation of Labor-Congress of Industrial Organizations
BEA	Bureau of Economic Analysis
BED	Business Employment Dynamics
BLS	Bureau of Labor Statistics
BPT	business, professional, and technical services
CPS	Current Population Survey
EIN	Employer Identification Number
FDI	foreign direct investment
GAO	Government Accountability Office
GATS	General Agreement on Trade in Services
GDP	gross domestic product
IT	information technology
ITAA	Information Technology Association of America
LEHD	Longitudinal Employer Household Dynamics Data
MGI	McKinsey Global Institute
MLS	Mass Layoff Statistics
MNC	multinational corporation
NAICS	North American Industry Classification System
OECD	Organisation for Economic Co-operation and Development
PUMS	public use microdata sample
QCEW	Quarterly Census of Employment and Wages
QWI	Quarterly Workforce Indicators
SIPP	Survey of Income and Program Participation
TA	Technology Administration (Department of Commerce)
UI	unemployment insurance
WTO	World Trade Organization
Y2K	Year 2000

EXECUTIVE SUMMARY

The shifting of business operations to off-shore locations and its impact on America's workforce and economy are central to national debates about the benefits and costs of economic growth and trade expansion. However, there is little consensus on the magnitude and significance of off-shoring activity and its impact on U.S. employment, workers' earnings, and the economy in general. In part, this reflects the lack of a commonly accepted definition for the current off-shoring phenomenon, the different aspects of off-shoring activities that have been reviewed, and the use of data of varying quality from various sources. But, the inherent complexity of these activities also adds to disparate views about the extent and effects of off-shoring. While concerns about off-shoring and its economic impacts are not new, current heightened interest focuses on the services sector and white collar, high tech jobs, rather than on manufacturing activities and blue collar jobs. The Bureau of Labor Statistics (BLS), the Bureau of Economic Analysis (BEA), and others have attempted to expand the range and improve the quality of available data. These efforts, while useful, do not point directly to what needs to be measured. Recent studies by the Government Accountability Office (GAO), and others reinforce a growing consensus about the need for better data.

STUDY OBJECTIVES

Public Law 108-447 authorized a grant to the National Academy of Public Administration (the Academy) to conduct a comprehensive study of off-shoring activities and their major economic effects, particularly any associated job shifts. Recognizing the disparity of views, Congress indicated that "information and opinion should be collected from stakeholders in business, education, and government, as well as professional associations and employee organizations." To direct the project and oversee the research, the Academy established an expert Panel of Academy Fellows and specialists, knowledgeable about international trade statistics and statistical systems. The Panel agreed that a comprehensive off-shoring study should answer the following questions:

1. How should off-shoring be defined?
2. What do currently available data indicate about the extent of U.S. off-shoring?
3. What additional data are needed to provide a more complete assessment of U.S. off-shoring?
4. What factors account for current U.S. off-shoring?
5. What are the major effects of off-shoring on U.S. workers and the economy and implications for the educational system?

Without a clear definition of and consistent terminology describing off-shoring, it is impossible to answer effectively these questions. Consequently, this first Panel report recommends a broad

definition of off-shoring and a consolidation of the multiple, confusing terminologies used to describe the phenomena into three basic terms: “outsourcing,” “off-shoring,” and “off-shore outsourcing.”¹ This report also reviews recent off-shoring studies to determine whether these studies provided a consistent set of estimates about the extent and significance of U.S. off-shoring and its economic impacts. Substantial differences among these studies suggest instead the need for additional research using appropriate, reliable methodologies to determine the extent and impacts of U.S. off-shoring and the adequacy of current data to develop such estimates.

OFF-SHORING COMPLEXITY CREATES UNIQUE MEASUREMENT AND ESTIMATION CHALLENGES

The complexity inherent in off-shoring arises from several sources: the wide gamut of reasons for making off-shoring decisions, the range of economic effects derived from off-shoring, and the need to consider both international trade and domestic labor-market dimensions in assessing the extent and effects of off-shoring.

Reasons for Off-Shoring

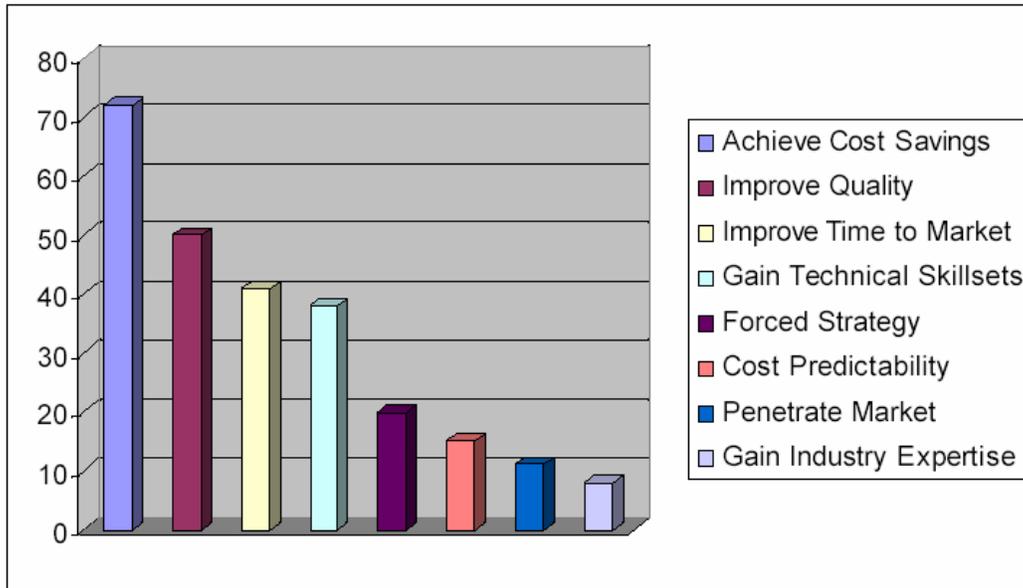
While anticipated cost savings is the most frequently cited reason for off-shoring particular activities or parts of a production process, previous studies identify a number of other reasons, as shown in the chart from a Ventoro survey of over 5,000 North American and European executives.² Many of these off-shoring reasons are the same for firms choosing to outsource an activity or part of their production process to an independent domestic supplier. However, access to new markets and skill sets that may be in short supply domestically are unique to off-shoring. Previous studies have also found that the reasons for off-shoring can change over time as firms gain more experience with off-shoring activities. Moreover, several studies note that the risks involved in off-shoring have produced failures and caused companies to reverse their off-shoring decisions.³

¹ “In-shoring”—the foreign counterpart to U.S. “off-shoring”—is also relevant to any comprehensive assessment of “off-shoring.”

² Ventoro, *Offshore 2005 Research Preliminary Findings and Conclusions* (Portland, OR: Ventoro, 2004).

³ Again, the Ventoro survey found that about one-third of off-shoring projects had to shift some or all of the off-shored operation back on-shore.

Why Move Off-Shore?



Source: Ventoro Offshore 2005 Research Preliminary Findings and Conclusions

Range of Economic Effects

Off-shoring decisions can generate a wide range of economic effects, reflecting the gamut of reasons for off-shoring activities. While shifts in employment and other job changes are a critical concern, other economic effects include greater operational efficiency, improved product or service quality, expanded growth opportunities, increased income, reduction (or avoidance) of regulatory and other market barriers, price changes for the off-shored goods and services, and wage impacts for affected workers. Many of these economic effects occur both domestically and overseas. The emergence of economic effects depends upon the activity being off-shored, reasons for that decision, and relative success or failure of the relocated activity. All economic effects, including any employment effects and job shifts, derive from the relocation of a current activity or a part of an ongoing process. Since off-shoring decisions affect location of business activities, these changes are potentially measurable. However, because the economic effects of off-shoring—including any net employment shifts—derive from business location changes, their relationship to these location changes needs to be assessed.

Net Employment Effects

Net employment effects from off-shoring depend on not only the number of jobs shifted, but also changes in the mix of jobs, skill requirements, and total compensation paid to domestic workers relative to payments to foreign contractors or affiliated companies. Off-shoring employment impacts can vary over time and include both direct and indirect effects. As Chapter 2 explains, indirect employment effects can increase or decrease the net employment changes derived from off-shoring. For example, efficiency or quality improvements should increase demand for products or services that depend upon the off-shored activity, offsetting some of the net

employment shifts from off-shoring. On the other hand, expansion of off-shored activity could reduce future demand for U.S. exports and increase the net employment shifts from off-shoring. Two points are clear about these indirect employment effects: they are important and therefore cannot be ignored and their estimation is not straightforward. Econometric models are commonly used to estimate these employment effects.

International Trade and Domestic Labor-Market Dimensions

Accurately assessing the impacts of off-shoring is complicated because it involves international trade and domestic labor-market dimensions. Both trade and domestic labor-market data are needed to help measure the extent of off-shoring and estimate its effects. Relocation of an outsourced activity overseas should increase imports of that activity. It is unclear whether current import data are sufficiently detailed to accurately measure the shifting of specific business activities off-shore and, equally important, whether the effects of off-shoring can be distinguished from other changes affecting trade flows. From a labor-market perspective, off-shoring is one of several structural reasons for the substantial number of jobs created and destroyed quarterly in the U.S. economy. Assessing the employment effects of off-shoring should be done relative to these other structural sources of job shifts.

CONSISTENT TERMINOLOGY AND A SINGLE DEFINITION FOR OFF-SHORING WOULD REDUCE CONFUSION

The Academy Panel’s review of previous off-shoring studies revealed that different terminologies are used to describe similar economic phenomena. One reason for the differences in the estimates of the extent and effects of off-shoring among current studies was the different definitions of off-shoring used. The Panel found the multiplicity of terms currently used to describe various aspects of off-shoring activity unnecessarily complex. **The Panel suggests that three key terms be used: “outsourcing,” “off-shoring,” and “off-shore outsourcing.” The Panel recommends they be defined as follows:**

- **Outsourcing—firms contracting out service and manufacturing activities to unaffiliated firms located either domestically or in foreign countries**
- **Off-shoring—U.S. firms shifting service and manufacturing activities abroad to unaffiliated firms or their own affiliates**
- **Off-shore outsourcing—a subset of both outsourcing and off-shoring in that it refers only to those service and manufacturing activities of U.S. companies performed in unaffiliated firms located abroad**

Because off-shoring is not unique to the United States, “in-shoring” is commonly used to reflect the foreign counterpart of U.S. off-shoring. Thus, **“in-shoring” should be defined as “foreign firms shifting service and manufacturing activities to the United States to either unaffiliated firms or their own affiliates.”**

The Panel's recommended definition for off-shoring is much broader than many others that restrict off-shoring to certain activities or to activities shifting to certain locations, as described in Chapter 3. This broad definition avoids creating artificial distinctions for similar economic transactions with the same economic effects—such as including only multinational corporation (MNC) activities within the off-shoring definition. It also avoids the pitfalls of narrow definitions that change over time and thus create ambiguity over which transactions are “off-shoring.” For example, the economies of low-wage countries can grow over time, or affiliated firms can be sold off over time. The Panel, however, believes the definition of off-shoring should be consistent through time to avoid such ambiguities.

CURRENT ESTIMATES OF OFF-SHORING VARY

The literature review presented in Chapter 4 had several objectives:

- determine whether the studies reviewed provide a consistent set of estimates about the extent of U.S. off-shoring and its various economic effects, including any net employment shifts
- identify how currently available data affect estimates of the extent of off-shoring and its economic effects
- examine the methodologies and data used to develop estimates and the ability to overcome particular data limitations

Major studies that have estimated the employment effects of off-shoring develop three different types of employment estimates: some focus on jobs potentially vulnerable to off-shoring, others present projections of future employment effects, and a third group estimate actual job shifts that have occurred. In addition to the significant variation in definitions already discussed, these studies have substantial differences in terms of data used, periods covered, analytic methodologies employed, and estimates of employment and other effects from off-shoring. Given these differences, the range of estimates contained in these previous studies is understandable.

Several analysts compare their estimates of the numbers of jobs impacted by off-shoring to total annual job losses in the United States. Data from BLS' Business Employment Dynamics (BED) data series indicate that quarterly gross job losses and gains since 2002 have averaged between 7 and 8 million, with the gains exceeding the losses since the second quarter of 2003. Compared to these aggregate gross U.S. job flows, job-loss estimates from previous off-shoring studies, ranging between less than 15,000 to 192,000 annually (see Table 4-3 in Chapter 4), appear modest. However, this aggregate comparison does not account for potentially significant distributional issues for particular occupations or areas affected, nor does it consider the severity of the adjustment costs imposed on workers displaced by off-shoring.

NEED FOR ADDITIONAL RESEARCH

Unfortunately, these previous studies did not indicate any convergence in the range of off-shoring estimates, a consensus on the specific, additional data needed, or the preferred methodology to use in assessing the scale, scope, and impacts of off-shoring. Most studies used a different definition of off-shoring, usually narrower than that recommended by the Panel. Use of narrower definitions could understate the extent of off-shoring activity relative to the Panel's definition.

Only a few studies attempted to estimate any off-shoring effects beyond direct employment impacts.⁴ Those studies found that indirect effects substantially reduced the estimated employment shifts from off-shoring.

A number of studies identify limitations in currently available government data that impede a full assessment of off-shoring, but none have attempted to link industry and trade data available from BEA with the employment and wage data available from BLS. While such data linkage will undoubtedly be difficult, any assessment of the adequacy of current government data is incomplete if it does not fully consider and use all available data.

Another reason for substantial differences among the current off-shoring studies is that several relied on proprietary data and methodologies that were not wholly transparent. The inability to replicate many of these analyses and evaluate their findings adds to the need for further research.

The review of previous off-shoring studies also points to a need to look at distributional consequences. While the aggregate number of direct job shifts from off-shoring may appear small relative to the total number of job losses and gains occurring in the U.S. economy, these aggregate comparisons may mask important effects if they are concentrated in certain industries, occupations, or areas. If the off-shoring activity affects only a limited number of functions that are further concentrated in specific geographical areas or particular occupations or professions, the derived employment effects can be significant for those impacted areas. A disaggregated analysis of key sectors is needed to determine whether such distributional consequences are present and their significance. Chapter 5 describes the additional research needed for a more complete assessment of off-shoring activities and the adequacy of current data to estimate its extent and economic effects.

IMPLICATIONS FOR OTHER KEY ISSUES

To assess the impact of off-shoring on U.S. workers, the economy, and the education and training system, this assessment will need to examine a number of key issues:

⁴ The major studies estimating indirect employment effects include the following:

Martin Neal Baily and Robert Z. Lawrence, "Don't Blame Trade for the U.S. Job Losses," *The McKinsey Quarterly* 1 (2005).

Global Insight and Information Technology Association of America (ITAA), *Executive Summary: The Comprehensive Impact of Offshore IT Software and Services Outsourcing on the U.S. Economy and the IT Industry*. (Lexington, Massachusetts: ITAA, March 2004).

Adjustment problems for workers displaced by off-shoring activities and impacted communities. It can be difficult and costly for workers and communities to adjust to job shifts caused by off-shoring. For workers, these problems include their reemployment experience, wage and benefit differences between old and new jobs, any training and relocation costs, and other income changes affecting their long-term financial prospects. For communities, the adjustment problems include changes in economic activity, property values, tax revenues, and demands for social services. There are two critical issues for workers and communities impacted by off-shoring—the size and severity of the problems described above and their significance relative to difficulties experienced for other reasons.

Role of temporary workers and foreign students in meeting labor-market needs for particular worker skills. Temporary workers, admitted under several different migrant visa programs, provide a means of meeting increased demands for particular skills in the U.S. labor market. Foreign students have accounted for an expanding share of college and university graduates, particularly in the science and engineering disciplines, with many looking for employment in the United States after graduation. Business groups and individual firms seeking such help maintain that this labor source allows them to retain high-skilled jobs within the United States. A key issue is whether off-shoring has altered the traditional roles played by temporary workers and foreign students in meeting U.S. demands for particular skills. The adequacy of current data to support such analyses is also unclear.

Demographic trends affecting the quality and experience of the U.S. workforce. The pending retirement of “baby boomers” over the next decade has identified the need for skilled replacement workers. Some disturbing recent trends in educational achievement levels and dropout rates among U.S. students have raised questions about the country’s ability to meet this need. If these emerging labor quality issues and projected declines in the U.S. labor force materialize, businesses may try to meet increased demands for specific skills through various means, including technological changes (e.g., substituting different forms of capital for the skilled labor in short supply), increased use of legal immigrants, or off-shoring business activities requiring particular skills to areas where the skills are more abundant.

Ability of U.S. educational system to meet the changing demands for worker skills. The emergence of large populous countries, like China and India, into the global labor market creates challenges for the current U.S. dominance in developing and employing scientific and engineering workers and researchers. Off-shoring activities can compound these challenges if they result in declining employment prospects for certain professionals and occupations newly perceived to be vulnerable to international competition. Since previous academic studies and reports have documented this increase in the supply of foreign trained engineers, scientists, and high-skilled technical workers, a key question is how those changes have affected the employment and earnings of U.S. workers in jobs requiring such skills. Further research is also needed into how current

off-shoring activities affect students' career choices and how the education and training system responds.

CHAPTER 1

INTRODUCTION

The migration of U.S. jobs off-shore and its impact on America's workforce and economy is neither new, unfamiliar, nor unstudied. It has been the focal point of frequent national debates about the benefits and costs of globalization, open markets, trade expansion, and economic growth. However, these periodic debates have not produced consensus on the magnitude and significance of the net migration of U.S. jobs off-shore or the impact on U.S. workers and the economy.

Recent national concerns about potential job losses and other economic effects from business decisions to relocate operations off-shore have introduced some new dimensions to this familiar debate. Slower than expected growth in employment during the recovery from the 2001 recession is one new element that has increased public anxiety, partly because reasons for this are not fully understood or effectively explained. Recent, rapid technological changes, especially those involving the Internet and related information and communications technologies, have lowered geographic barriers and facilitated changes in the way businesses operate, workers perform their jobs, consumers shop, and people interact. These changes provide a wide range of benefits: businesses can improve their efficiency, serve new markets, and develop new or improved products; workers can increase their productivity, undertake new tasks, and operate in different environments, such as telecommuting; and consumers can choose from a wider range of products with differing price and quality mixes.

But these changes can also impose substantial costs, particularly on those who must adjust to them. Adjusting to a job loss is frequently traumatic and costly for many workers. This reality may also explain the heightened public anxiety about the prospect of job losses from off-shoring activities, especially if jobs now vulnerable to migration overseas were previously thought to be firmly anchored in this country. Although the continuing loss of U.S. manufacturing jobs remains an issue, much concern about recent off-shoring job migration focuses on service-sector, white-collar, and high-technology jobs, rather than on more traditional manufacturing jobs.

Previous difficulties in assessing aggregate economic and social impacts, as well as specific sectors and individuals affected by manufacturing job migration have been compounded by the dearth of detailed, reliable, valid, and timely data on service-sector, white-collar and high-technology jobs, and different groups involved. A number of recent off-shoring studies by the Government Accountability Office (GAO), U.S. Senator Joseph Lieberman's staff, The Brookings Institution, and others have reinforced a growing consensus about the need for better data.

ORIGINS OF THE ACADEMY STUDY

Public Law 108-447 gave the BEA authority to offer a grant to the Academy to conduct a comprehensive study of off-shoring. Recognizing the disparity of views on the issue, Congress

also indicated that “information and opinion should be collected from stakeholders in business, education, and government, as well as professional associations and employee organizations.”

In an April 27, 2004, letter to the Secretary of Commerce, Frank Wolf, chair of the House Appropriations Subcommittee for Commerce, Justice, State, the Judiciary, and Related Agencies, cited the lack of reliable data on off-shoring as a major impediment to better understanding and responding to the issue of job losses. Chairman Wolf’s letter highlighted the need to obtain and disseminate data on the following:

1. numbers and types (by occupation, skill level, and wages) of jobs moving offshore
2. reemployment experience and prospects for American workers displaced by off-shoring
3. numbers and types of jobs created overseas by U.S.-owned companies for the purpose of exporting to U.S. markets and serving foreign markets
4. numbers and types of jobs created in the United States by foreign-owned companies for the purpose of selling in the U.S. market and exporting to overseas markets
5. near-term and long-range plans for relocating company facilities and transferring jobs to overseas locations
6. impact of off-shoring on academic and career choices by American students
7. role of the H1B and L-1 temporary visa programs in off-shoring operations by U.S.- and foreign-owned companies

Although Chairman Wolf’s letter cited unemployment among electrical, electronics, and computer engineers in the United States and potential impacts on the nation’s ability to create high-wage, high-technology jobs in the future, the seven categories of additional data needs he identified were not limited to the technology sector.

OBJECTIVES OF THE ACADEMY OFF-SHORING STUDY

The current debate over off-shoring and its impact is heavily laced with anecdotes about specific firms. While these anecdotes highlight problems for displaced workers, they do not provide comprehensive information needed by policymakers, analysts, and citizens to fully understand the extent and significance of current off-shoring. Without that information, it is difficult to develop effective policy interventions.

A comprehensive study of off-shoring should also acknowledge the vast array of existing studies examining different aspects of off-shoring. Although some studies cite the need for additional or better data to measure or estimate off-shoring’s economic and employment effects, there appears to be little consensus on other critical elements. Indeed, many studies acknowledged lack of a consistent definition and often used different terminology for off-shoring. In addition, these

studies used a variety of analytical techniques, a number of data sources, and examined different industries or occupations over different time periods.

The Academy and BEA agreed that a comprehensive study of off-shoring should address these fundamental issues:

1. How should off-shoring be defined?
2. What do currently available data indicate about the extent of U.S. off-shoring?
3. What additional data are needed to provide a more complete assessment of U.S. off-shoring?
4. What factors account for current U.S. off-shoring?
5. What are the major impacts of off-shoring on U.S. workers and the economy and implications for the educational system?

This is the first of several reports prepared for BEA conveying the Panel's findings and recommendations on off-shoring.

STUDY METHODOLOGY

The Academy established an expert Panel of Academy Fellows and specialists, knowledgeable about international trade statistics and statistical systems, to direct the project and provide guidance to Academy staff in conducting this research. The Panel has already held three meetings—and will hold additional meetings at strategic points during the study—with key stakeholders to obtain their perspectives on off-shoring issues, review developments, examine specific research results, assess the study's progress, and provide guidance and advice to the project staff.

Addressing each of the five fundamental issues involves a combination of different research methodologies and analyses, including reviews of available data and studies; interviews with government officials and business, labor, academic, and other experts; identification of inconsistencies and/or information gaps that need to be addressed; and assessments of alternatives for resolving inconsistencies or gaps. The Panel will consider some limited data collection or estimation using industry studies to determine the adequacy, validity, and reliability of additional data and the feasibility of extending the approach to meet broader data needs.

Issue 1: How should off-shoring be defined?

Without a clear, accepted definition of off-shoring and use of consistent terminology to describe the same phenomena, it is impossible to address off-shoring issues. To assess these definitional issues, the Panel reviewed and analyzed official domestic and international studies and data on employment shifts. The Panel also reviewed nonofficial data that may supplement or extend

official data. Analyses of previous research, interviews with selected researchers, and interviews with other experts from government data collection agencies, academe, business groups, employee organizations, and other entities constituted principal sources of information. Studies and interviews included both domestic and international sources.

The Panel examined the range of definitions used in studies, evaluated their relative strengths and weaknesses, established selection criteria for choosing a preferred definition, recommended a preferred definition, and assessed it relative to the criteria and other currently used off-shoring definitions.

Issue 2: What do currently available data indicate about the extent of U.S. off-shoring?

The Panel will review estimation methodologies and collection processes used to develop currently available trade and employment data that might help measure or estimate the economic and employment effects from off-shoring. These database assessments will examine the rigor or limitations of approaches used to develop existing data and identify any inconsistencies or gaps in coverage, level of detail, and timeliness of these official data sources. The Panel will also review previous estimates of employment effects from off-shoring to identify effective, replicable approaches for using current data or overcoming data gaps. In addition, the Panel will determine whether data deficiencies account for inconsistencies among these estimates. Follow-up interviews with analysts who produce the data and researchers who use the data will help the Panel focus on the reliability and utility of data from both official and unofficial sources.

While a definitive answer may not be feasible, the Panel will assess what can be concluded about the economic and employment effects from off-shoring activities based on currently available studies and data.

Issue 3: What additional data are needed to provide a more complete assessment of the economic and employment effects from off-shoring?

The Panel will use information from its database assessment to identify potential data gaps, including not only missing information, but also incomplete or inconsistent data, as well as estimates with large or variable error ranges. Additional interviews with researchers and other data users and reviews of previous research—including case studies that have used additional unofficial data to supplement available official data—will help identify the value of supplementary data in measuring or estimating the impact of off-shoring activity.

The Panel plans to undertake several industry studies to develop estimates of employment and other economic effects from off-shoring in critical functional areas and to assess the need to fill potential data gaps, the most feasible way to fill them, and the likely costs of filling them. These studies will employ a range of analytical techniques and will attempt to link existing databases to determine how much of the potential data gaps can be filled without seeking additional data.

Issue 4: What factors account for current U.S. off-shoring?

The Panel will review academic and other research that examines the conditions contributing to, and the expectations arising from, business decisions to off-shore operations. This review will include case studies from academics, industry groups, and employee organizations on specific off-shoring decisions and their effects on individual companies or specific occupations. Interviews with principal researchers and authors of major studies will provide additional information and perhaps indicate the feasibility of updating, augmenting, or extending some of them. The Panel's industry studies will also examine, if possible, firms' decision processes, expected outcomes, and information used in deciding to off-shore certain business processes. Interviews with corporate leaders, knowledgeable industry experts, and off-shoring facilitators will provide some of the information for these studies.

Issue 5: What are the major impacts of off-shoring on U.S. workers and the economy, and the implications for the educational system?

Workers displaced by off-shoring are expected to endure unemployment and income loss, the severity and duration of which remain uncertain. It is also unclear whether the impacts on workers displaced from off-shoring differ from the impacts on workers displaced for other reasons—such as demand shifts or technological change—who have similar skills and experience in the same occupation or industry.

To assess the impacts on displaced workers, the Panel will review previous studies, evaluate certain case studies of job off-shoring and the effects on specific industries and/or occupations, and interview selected academic experts and officials from corporations, labor organizations, and business and trade groups who have experienced off-shore job shifts. We will also interview government officials familiar with adjustment assistance programs to obtain their views and estimates of unemployment duration and severity and income losses for covered displaced workers. Additional research will use longitudinal data files from BLS and/or the U.S. Census Bureau to estimate worker displacement effects.

In order to identify the broader implications of off-shoring on the U.S. labor market and educational and training systems, a literature review will be undertaken to assess these relationships. In addition, interviews will be conducted with academic leaders and officials from research groups representing or focusing on the educational system to obtain their perspectives on the implications of off-shoring for the educational and training system.

ROAD MAP TO THE FIRST REPORT

Chapter 2 provides additional background information on the conditions surrounding off-shoring activities and presents a conceptual framework for evaluating the significance of economic and employment effects from off-shoring relative to similar effects from other changes affecting the U.S. economy. The chapter describes the complex, direct and indirect economic and employment effects derived from off-shoring business processes or operations, the importance of estimating both types of effects, the need for econometric modeling to estimate these effects, and

additional measurement and data challenges resulting from this inherent complexity. The chapter defines the international trade and domestic labor-market dimensions applicable to off-shoring activity and identifies those other trade and labor-market changes that can result in economic and employment effects similar to those caused by off-shoring.

Chapter 3 reviews various definitions of off-shoring and the often confusing and conflicting terminology describing aspects of off-shoring. After reviewing the relevant terminology currently used in off-shoring studies, the Panel recommends that three key terms be used to describe various aspects of off-shoring activity: “outsourcing,” “off-shoring,” and “off-shore outsourcing.” The Panel also identifies and defines “in-shoring”—the foreign counterpart to U.S. “off-shoring”—as another key term pertinent to an assessment of off-shoring. The Panel establishes four selection criteria for choosing a definition for off-shoring, recommends a broad-based definition of off-shoring, and then uses the proposed selection criteria to compare the advantages and disadvantages of its recommended definition to other definitions.

Chapter 4 compares estimates of employment effects from off-shoring and discusses potential jobs vulnerable to off-shoring, projections of future employment effects, and estimates of actual job shifts. Although they vary widely, the range of estimated job shifts from off-shoring appear relatively small when compared to total annual U.S. job gains and losses from all sources. The chapter also identifies different methodologies used to develop estimates of job shifts from off-shoring. This review notes that there is no agreed-upon methodology for assessing off-shoring’s economic effects, especially its employment effects: each has strengths and weaknesses. For each major methodology used in current studies, the chapter describes the application, identifies reasons that analysts selected the particular methodologies, and examines their relative strengths and weaknesses.

Chapter 5 describes additional research the Panel has planned, which will include conducting specific industry studies, utilizing existing data, linking currently independent data sets, and applying additional data to estimate the economic and employment effects from off-shoring activities. This additional research will also determine the significance of potential data gaps, demonstrate the feasibility of filling those gaps (or overcoming them with alternative estimation techniques), and estimate the cost of developing improved estimates of the economic and employment effects from off-shoring.

CHAPTER 2

OVERVIEW AND CONCEPTUAL FRAMEWORK

Over the past few years, the shifting of some operations off-shore by U.S. corporations has heightened concerns about the impact on America's workforce and economy. Some of these heightened concerns may reflect frustration with the slower than expected growth in employment as the U.S. economy recovered from the 2001 recession. Although growth in the fourth quarter of 2001 caused real GDP at the end of 2001 to exceed its prerecession peak, total nonfarm employment did not exceed its prerecession peak of 132.5 million (February 2001) until January 2005. But, these heightened concerns may also reflect the impact of recent technological changes, especially those in Internet and related information and communications technologies that facilitated restructuring of business processes and lowered geographic barriers to relocating business activities. These changes, in turn, have increased the number and types of jobs potentially vulnerable to obsolescence from technology and have generated competition from other domestic and new foreign sources.

Current concerns over off-shoring emphasize the loss of service-sector, white-collar, and high-technology jobs, rather than heavy manufacturing jobs previously the focal point of public debate about international trade's benefits and costs. The migration off-shore of jobs that were previously thought to be firmly anchored in this country, raises issues about current off-shoring activities imposing different and perhaps more adverse economic impacts than past activities. For example, past concerns about the loss of manufacturing jobs to overseas competitors raised issues about the loss of American economic dominance, increased reliance on foreign sources for critical supplies and manufactured goods, and the national security implications of this growing dependence should those foreign sources be interdicted or interrupted. Current concerns have raised additional issues about American leadership in research and development and the application of technological advances on future economic growth. While these concerns are well publicized and known, the basis for them is much less clear, reflecting confusion over, and at times inappropriate and interchangeable use of, terms such as "off-shoring," "outsourcing," or "global sourcing." This confusion also reflects the widespread and complex economic effects of relocating certain business activities and functions outside the United States, which reinforces the need for better, more complete, and timely data on the services sector—the increasingly dominant segment of the U.S. economy.

This chapter examines major elements and effects of off-shoring activities, provides an overview of off-shoring activities relative to other major trends in the U.S. economy, and develops a conceptual framework for assessing off-shoring issues in relation to other significant economic issues confronting the U.S. economy and workforce. The major off-shoring elements help account for the varied reasons for off-shoring decisions that, in turn, determine their economic effects. The significance of the economic effects from off-shoring, and the issues raised, must be evaluated relative to other economic changes. In short, off-shoring activities need to be viewed from an appropriate perspective. That perspective must also encompass the complexities underlying off-shoring decisions, their economic and employment effects, and the lack of a commonly accepted definition of off-shoring. These complexities compound the difficulty in

measuring and estimating off-shoring activity and its effects. Any assessment of the adequacy of off-shoring data must acknowledge and address these difficulties.

MAJOR ELEMENTS OF OFF-SHORING

Despite the myriad of definitions characterizing off-shoring, virtually all analysts, commentators, and discussants agree that off-shoring reflects economic and financial decisions made by U.S. businesses to locate activities or functions overseas. There is less agreement on the reasons for those decisions, reflecting the complex array of conditions, assumptions, and calculations underlying them. The varying estimates of off-shoring's effects likewise reflect the wide range of potential economic impacts and the number of significant public-policy issues raised. While this report focuses primarily on U.S. off-shoring, the phenomenon is not unique to U.S. businesses. The foreign counterpart to U.S. off-shoring—foreign companies shifting some of their operations to the United States—results in in-shoring of new business activities and employment for the United States. The next section of the report examines the complexities surrounding off-shoring issues in greater detail.

Outsourcing versus Off-Shoring

Any overview of off-shoring must distinguish it from another commonly used, but distinct term—outsourcing. Outsourcing refers to a business restructuring or change in current business practice that shifts operations or processes previously performed within the company to an outside entity—an independent third party. One result of outsourcing is that the locus of work shifts, and associated jobs migrate, outside the company. For both private firms and the federal government, outsourcing or “contracting out” shifts or redistributes jobs among employers, but does not necessarily reduce the number of jobs in the United States. Employment changes depend upon the realization of efficiency gains, productivity increases, or cost saving.⁵

Outsourcing decisions are made for different reasons, but improved efficiency or cost reductions are key.⁶ Cost reductions can be achieved by reducing the number of workers, using lower cost workers, or introducing more efficient production techniques that increase labor productivity and lower labor costs. Only the first of these results in direct employment losses, although job migration to other locations displaces current workers.

Off-shoring refers to the shifting abroad of business activities or processes. Off-shoring can be a subset of outsourcing, if the new supplier of the outsourced activity is located in a foreign country. In this case, one result of off-shoring should be an increase in imports of goods and services to meet the company's production needs or customer demand. However, off-shoring⁷ can also represent business expansions abroad to serve foreign markets, which may occur

⁵ Within the federal government, such activity has frequently been described as “contracting out” and is subject to guidance provided in the Office of Management and Budget circular A-76.

⁶ Other reasons for outsourcing include quality improvements due to higher specialization among independent suppliers, access to new products or inputs from technological changes, or responding to temporary increases in demand.

⁷ A number of analysts have excluded these possibilities from their definition of off-shoring. See discussion in chapter on alternative definitions.

without restructuring business activities or processes in the United States. In this instance, the off-shoring activity may not immediately affect U.S. imports. However, it could reduce current or future U.S. exports to the extent that the new off-shored operation provides goods and services to foreign markets that had been or might have been satisfied by U.S. exports.

Key Off-Shoring Components

Off-shoring decisions arise in different ways; they can have different purposes and expected benefits and can face different risks, all of which can change over time. Indeed, off-shoring decisions themselves can change over time and in some instances those decisions have been reversed. These aspects of off-shoring reflect the inherent complexity underlying these business decisions.

Complexity occurs because off-shoring decisions are often included in broader decisions to restructure an ongoing business process into a series of separable, discrete functions, some of which can be performed outside the firm. While this is the most commonly cited “model,” an off-shoring decision can also reflect a simpler decision to reorganize activities among affiliates within the corporate entity and relocate certain business operations or expand existing operations in select (foreign) affiliates.

Off-shoring decisions are made for many of the same reasons as outsourcing decisions, which adds to the inherent complexity of off-shoring activities. Virtually all of the studies examining business off-shoring decisions and their anticipated benefits identify cost savings as the leading expected benefit. However, previous studies⁸ cite a number of other reasons for off-shoring certain business activities, including:

- expanding service delivery (e.g., 24-7 operations)
- providing new services that lower costs can make economically viable (e.g., certain telemarketing services)
- restructuring work activity to meet peak demand requirements (e.g., lower labor costs may permit increased staffing at peak demand hours)
- upgrading the quality of service by using higher-skilled (but lower-cost) workers to lower error rates
- accelerating the formulation of innovative products and services using different technology and cost structures

⁸ Examples of these studies include: McKinsey Global Institute, *Off-Shoring: Is it a Win-Win Game?* (MGI, August 2003), 1-2; Ventoro, *Off-Shore 2005 Research: Interim Findings and Conclusions* (Ventoro, 2005), 14; Deloitte Research, *Making the Off-Shore Call: The Roadmap to Communications Operators* (Deloitte Research, 2004), 5; Deloitte Research, *The Cusp of a Revolution: How Off-Shoring Will Transform the Financial Services Industry* (Deloitte Research, 2003), 3.

- increasing revenues by pursuing previously marginal revenue opportunities (e.g., more follow-up of smaller loan delinquencies)
- supplying new (foreign) markets
- acquiring new sources for certain types of workers when there is a domestic shortage for those workers (e.g., temporary foreign worker limits could induce some firms to shift work overseas to obtain the necessary skilled workers)

While off-shoring and outsourcing decisions anticipate many of the same expected benefits, access to new markets or new sources of supply for inputs facing domestic shortages distinguish off-shoring from domestic outsourcing decisions.

Specific off-shoring decisions may anticipate realizing several of these benefits; moreover, the set of expected benefits from off-shoring decisions can change over time as firms become more familiar with the capabilities of their off-shored operations, or as unanticipated problems arise. Some studies have also indicated that not only can expected benefits from off-shoring change over time, but that off-shoring decisions themselves are not necessarily immutable. For example, a 2004 Deloitte Consulting Outsourcing Study of 25 large U.S. companies found that “70 percent of participants have had unsatisfactory outsourcing experiences, encountering 2 to 10 problems and that 18 percent encountered 5 or more problems causing them to go through in-sourcing.”⁹ A 2004 report from the European Foundation for the Improvement of Living and Working Conditions cited a broader survey of information technology (IT) using firms that identified similar risks of failure. “A survey of over 5,000 IT user companies in the United States, Canada, and Europe by Ventoro found that of the 19 percent which had an off-shore strategy, only 45 percent said it was a success, and 36 percent claimed it had failed.”¹⁰ The Ventoro survey of 5,231 executives in North America and Europe (3,139 U.S.) also found that “over one in three executives reported they have had to ‘on-shore’ work (moving work from their off-shore team back to their on-shore team) due to performance problems with their off-shore strategy.”¹¹

POTENTIAL ECONOMIC EFFECTS FROM OFF-SHORING

Since the economic effects depend upon the reasons for off-shoring, those decisions can generate a number of different economic effects:

- operational efficiency
- quality of products and services

⁹ Deloitte Consulting, *Calling a Change in the Outsourcing Market—The Realities for the World’s Largest Organizations* (CITY, STATE: Deloitte Consulting, April 2005), 24.

¹⁰ European Foundation for the Improvement of Living and Working Conditions, *Outsourcing of ICT and Related Services in the EU* (Luxembourg: Office for Official Publications of the European Communities, 2004), 20.

¹¹ Ventoro, “*Off-Shore 2005 Research: Preliminary Findings and Conclusions*” (www.ventoro.com, Portland, Oregon: Ventoro, 2005), 17.

- growth opportunities
- changes in income
- reduction (or avoidance) of regulatory and other market barriers
- price changes for the off-shored goods and services
- wage impacts for affected workers
- employment shifts and changes

Employment effects are sensitive as well as controversial because they are complex and difficult to define and measure. The emergence of specific economic effects depends on the off-shoring activity that occurs and the relative success or failure of the relocated activities. These are derivative effects because an off-shoring decision can involve only the relocation of a whole business process, a piece of a business, a function, or a discrete piece of work. These shifts, in turn, can have employment, wage, price, productivity, profitability, efficiency, and economic growth implications. Business off-shoring decisions do not directly export U.S. jobs, growth opportunities, or competitive advantages. But, these important, derivative economic effects can be estimated independently from the business activities shifted off-shore that generated them. This introduces an additional layer of complexity compounding off-shoring measurement difficulties.

Employment Effects

Employment effects from off-shoring decisions can include both quantitative and qualitative components—not only numbers of jobs but differences in occupations and skills. There are also direct and indirect effects on domestic employment that vary over time—short-run effects can differ from long-run effects. Moreover, these employment effects depend upon the business activity off-shored and the reason for off-shoring. Off-shoring that relocates a domestically outsourced activity overseas generates different short- and long-run employment effects than off-shoring an activity to obtain access to new foreign markets or to meet growing overseas demands. A decision to outsource part of a business process or activity off-shore will eliminate the jobs associated with that off-shored activity, assuming that activity would have maintained its level of domestic operation. Off-shoring activities to meet overseas expansion needs may forego future export growth and associated employment opportunities, while off-shoring activities to secure access to new overseas markets may have little or no direct employment effects.

The most common public perception of the effect of off-shoring is that direct job losses occur as activities are relocated. But, this direct, short-run effect of a gross loss in jobs is difficult to

measure¹² and may differ over time if the expected gains from the decision do not materialize as anticipated. Not surprisingly, decisions to reverse an initial off-shoring move are not as well publicized as the initial off-shoring decision. In addition, public concern over direct job losses assumes that current domestic operations would have remained unchanged, but this assumption may not always be appropriate. If that activity were facing significant competitive pressures, demand for that activity might have fallen without some improved efficiency, thereby producing a decline in employment. Alternatively, to maintain current demand for the activity, the firm might seek efficiency gains by substituting capital for labor, thus reducing current employment levels. In short, direct, short-run job loss estimates may attribute to off-shoring some job losses that competitive pressures might have generated anyway, due to demand shifts or technological changes. Finally, the change in overseas employment associated with the off-shored activity may not be an accurate proxy for estimating direct, short-run job losses because lower wages for overseas labor suggest that more labor-intensive techniques most likely have been used. These examples show the complexity involved in measuring or estimating even these direct employment effects.

Most importantly, initial direct job-loss estimates ignore the following indirect effects associated with an off-shoring decision:

- impact of efficiency improvements on the costs of providing the off-shored goods or services and any derived demand effects from associated lower prices
- increased demands for goods and services from the increased income produced by the off-shoring activity (this can be both additional income in the foreign country and increased profits for the off-shoring firm)
- export growth from demands for additional equipment or services required to support the off-shored activity in its new locale
- reduction in exports (and associated domestic employment) as off-shoring activities expand to serve foreign markets currently or potentially served by U.S. exports
- increased requirements for management oversight and control over the off-shored activity
- multiplier effects associated with the changes in production, employment, and income from off-shoring (these can be positive and negative and may be offsetting)

Each of these potential indirect economic effects has employment implications. Several economic studies have attempted to estimate some of these indirect effects and their derived

¹² Even if one could survey businesses engaged in off-shoring to obtain employment impacts, those surveyed within the firm may not know the reasons for the changes in employment and there may be some resistance to disclosing those reasons on competitive grounds.

employment effects relative to the initial direct, gross job losses from off-shoring.¹³ Estimating these indirect effects requires an econometric model; they cannot be measured directly. In addition, many indirect effects accrue over time. While some—e.g., increased demand for equipment, services support, and management oversight—can occur in the short run, others, particularly derived effects from efficiency gains and lower prices and any increased demand from higher income, will emerge over the long run.

These direct and indirect employment effects from off-shoring are not new—they have for years been an issue for years in relation to manufacturing jobs that are vulnerable to increasing international competition. However, recent technological changes may have widened the potential scope of off-shoring employment effects to include a number of service-sector, white-collar jobs not considered vulnerable to increased competition from international trade.

Other Potential Economic Effects

While the employment effects of off-shoring receive the most attention, off-shoring's economic effects include the following:

- efficiency and competitiveness of the off-shoring firm
- prices of goods and services provided through the off-shoring activity
- profitability of the off-shoring firm
- wages of impacted and other workers
- income and employment opportunities for impacted workers
- broader economic factors including changes in imports and exports, aggregate demand, and national income

If the off-shoring decision is successful, the lower cost or improved quality of the off-shored goods and services should increase competitiveness, allow price reductions, and expand market share and profits. Consumers or other businesses using the off-shored product or service will also benefit from improved quality or lower cost. If the off-shored activity serves U.S. needs, there should be an observed increase in imports. However, if the off-shored activity is focused primarily on meeting overseas demands that are being met, in part, by current U.S. exports, those exports could decline or grow more slowly in the future. Alternatively, off-shoring activities that meet foreign demands may also open those foreign markets to U.S. businesses providing new growth opportunities, including potential future exports. Off-shoring's potential impact on U.S. exports thus appears uncertain.

¹³ A number of these studies, the methodologies used, and their estimated employment impacts are examined in chapter 4 of this report: Approaches to Estimating the Impact of Services Off-Shoring. The McKinsey & Company 2003 study, *Off-Shoring: Is it a Win-Win Game?*, the Bailey and Lawrence 2004 paper, *What Happened to the Great U.S. Job Machine?*, and the Global Insight and ITAA 2004 study are prime examples.

Economic theory suggests that an increase in labor supply affects wages and employment levels, depending upon the elasticity of the demand for labor. Because off-shoring activities reflect a shift to a larger worldwide supply of labor, several analysts have suggested that the potential effect on wages may be as significant as the potential employment effects. For example, Brainard and Litan suggest off-shoring can have divergent effects on wages, depending upon the vulnerability of a particular sector to trade. “In services for example, some workers whose jobs are vulnerable to off-shoring could suffer erosion of their wages while others in supervisory positions may see compensation gains.”¹⁴ In addition, the AFL–CIO notes that “as it becomes easier for companies to move work overseas, employers use the threat of sending work overseas to squelch union organizing drives and win concessions at the bargaining table.”¹⁵ Whether due to market adjustments or the exercising of market power, or both, wages of workers in activities at risk of being off-shored are likely to grow more slowly or possibly decline. However, estimating these wage effects raises additional measurement issues.

TWO SEPARATE DIMENSIONS OF OFF-SHORING

Off-shoring and its derived employment effects have an international trade and a domestic-labor-market dimension, each providing slightly different perspectives on assessing economic effects and their relative significance. These two perspectives also contribute to the differences in definitions of off-shoring in use.¹⁶ From the international-trade perspective, off-shoring is one element affecting the expansion of worldwide trade, the changes in the U.S. balance of payments accounts and terms of trade, and any shifts in the United States’ historical comparative advantage in trading knowledge-intensive goods and services. From a domestic-labor-market perspective, off-shoring is one source of the continuous job shifts that characterize the dynamic job market. While job shifts include both gains and losses, job losses can impose significant costs on individuals affected and on impacted communities, especially if the job losses are concentrated. In addition, off-shoring can be a way for employers to respond to shortages in the supply of skilled labor. However, it can create additional uncertainty about employers’ long-term needs for U.S. workers with specific skills and imposing challenges for the nation’s education and training system in meeting the labor market’s future skills needs.

The International Trade Perspective

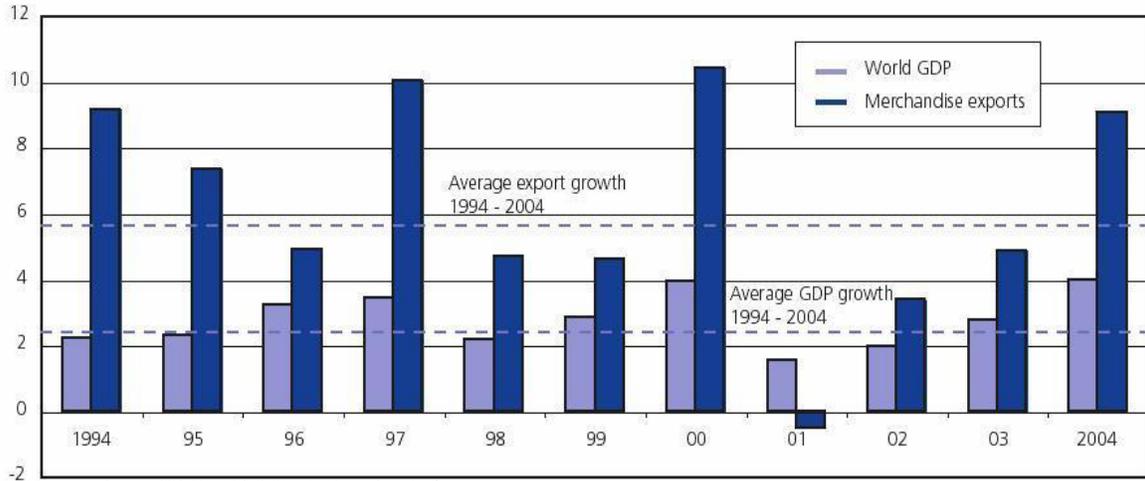
International trade has become an increasingly important component of the global economy. As figure 2-1 from the World Trade Organization’s (WTO) *2005 World Trade Report* indicates, the annual growth in merchandise exports has exceeded the growth in world GDP between 1994 and 2004, except in 2001. Indeed, the average annual growth in exports over the decade was almost twice the growth in GDP.

¹⁴ Lael Brainard and Robert E. Litan, “‘Offshoring’ Service Jobs: Bane or Boon—and What to Do?” *Brookings Policy Brief* 132 (April 2004): 5.

¹⁵ AFL–CIO report *Shipping Jobs Overseas: How Real is the Problem* p 1.

¹⁶ The chapter on definitions and terminology describes these differences fully.

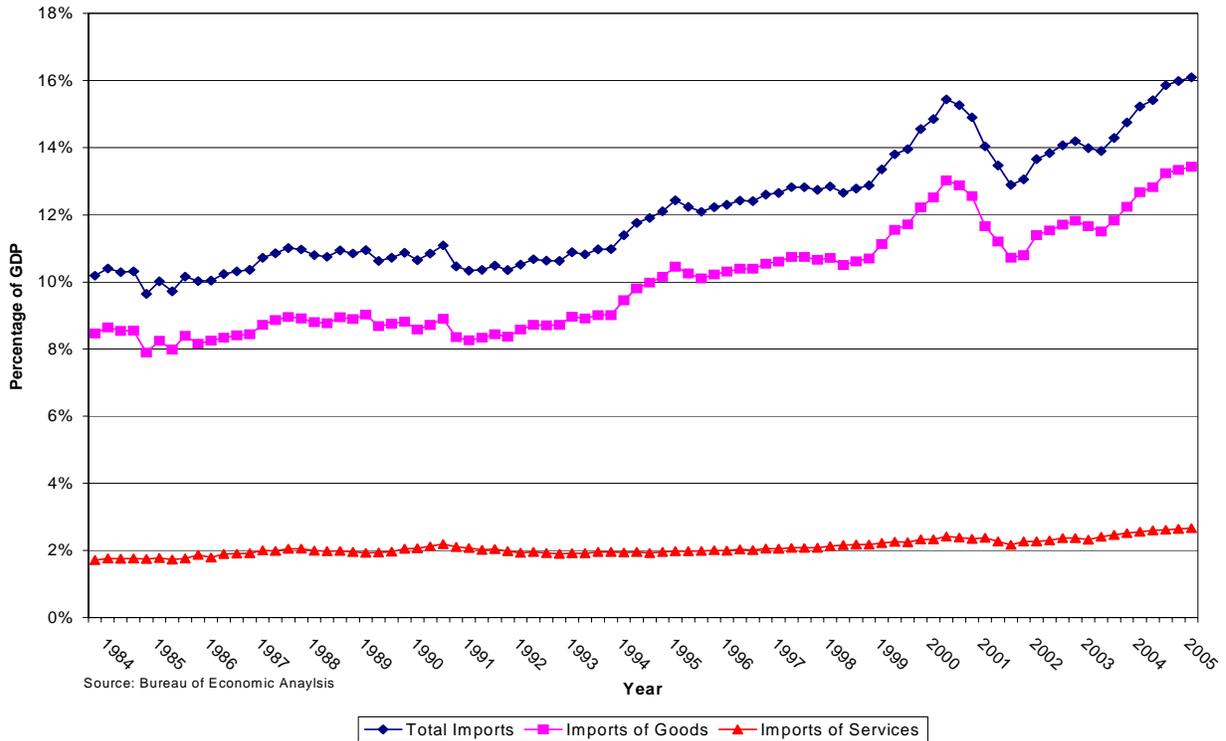
Figure 2-1
Growth in Volume of World Merchandise Trade and Gross Domestic Product, 1994-2004
(Annual Percentage Change)



Source: World Trade Report 2005, World Trade Organization

The external sector has also become an increasingly important part of the U.S. economy as Figure 2-2 shows.

Figure 2-2
Imports of Goods and Services as Percentage of Gross Domestic Product
First Quarter of 1984 through Second Quarter of 2005



Source: Bureau of Economic Analysis

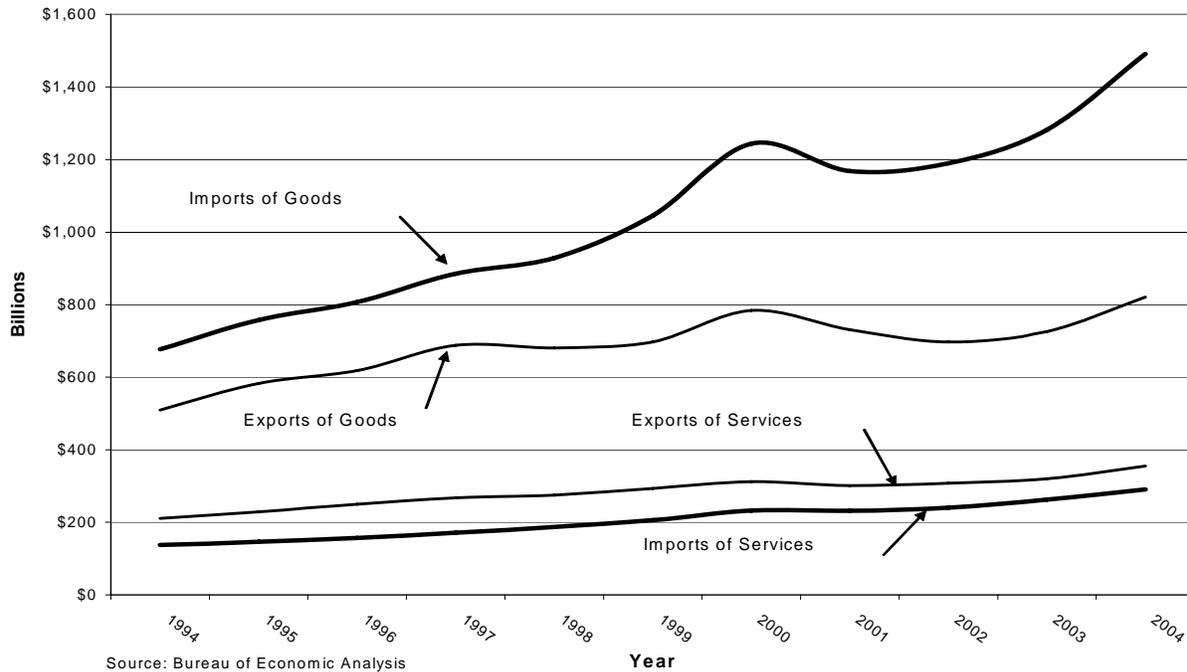
U.S. imports relative to GDP have increased from 11.3 percent in 1994 to over 16 percent in the first half of 2005. The export share of GDP has also grown over the past decade, albeit, at a slightly lower rate than the growth in imports. Figure 2-2 also illustrates that goods imports account for virtually all of this increase and are much more sensitive to economic cycles, as seen by the sharp decline in imports relative to GDP in 2001.

This expanded role for international trade reflects a number of phenomena, including technological changes, liberalization of markets, increased mobility of capital and labor, the expansion of MNCs, and declining trade barriers under new trade agreements. These same phenomena can also facilitate decisions of U.S. firms to off-shore some of their specific operations and activities. An increase in off-shoring activities can add to the growth in U.S. imports, as businesses and consumers increase their use of those goods and services off-shored. Off-shoring's impacts on U.S. exports are less certain. Exports that complement or support off-shoring should increase; similarly, demand for exports should also increase as foreign income from off-shored activities increases. But, expansion of off-shoring to serve foreign markets may compete with and replace U.S. exports that might have otherwise satisfied those markets.

U.S Trade Changes and Off-Shoring

While trends in U.S. trade data should reflect increases in off-shoring activity, it is difficult to discern such changes from aggregate data on U.S. imports. Growth in imported goods still accounts for much of the growth in U.S. imports over the last decade, while current off-shoring concerns have focused on particular service activities being relocated overseas. As Figure 2-3 shows, imports of goods have increased from \$668.7 billion in 1994 to \$ 1472.9 billion in 2004, with a particularly sharp increase after the 2001 recession.

**Figure 2-3
Exports and Imports of Goods and Services in the United States**



This growth has exceeded the growth in goods exports, accounting for the substantial increase in the U.S. trade deficit, particularly for the last four years. U.S. imports of private services have also increased over the last decade, from \$120.3 billion in 1994 to \$258.1 billion in 2004, but, unlike goods trade, services exports have continued to exceed imports. The private services trade surplus in 2004—\$65.3 billion—was about the same as it was in 1994—\$66.3 billion—even though service imports have grown slightly faster than exports over this decade. During this period, the services trade surplus peaked in 1997 at \$86.7 billion and has declined unevenly since.

The continued growth in services imports, particularly since the end of the 2001 recession, has received increased attention as public concerns about off-shoring of services have deepened. BEA divides total private-services trade into five subcategories: royalties and license fees, travel, passenger fares, other transportation, and other private services. Although royalties and license fees have been the fastest growing component of services imports, other private services—the component most likely to be affected by the off-shoring of services—also increased substantially and accounted for over 42 percent of the total growth in services imports over the past decade (\$59.1 billion of the \$137.8 billion total growth between 1994 and 2004).

Table 2-1 shows the growth in other private-services imports for both affiliated and unaffiliated trade, where affiliated trade represents international transactions by U.S. MNC parent companies and their affiliates in another country. Unaffiliated trade accounts for the majority of other private-services imports, 62 percent of total other private-services imports in 2004. However, for the category of business professional and technical (BPT) services, one of six subcategories into

which BEA divides other private services, affiliated imports have grown more rapidly than unaffiliated trade and account for 69.3 percent of BPT services imports in 2004. BPT services include the following types of services, many of which have been cited in press reports and previous studies as potentially vulnerable to off-shoring:

- accounting, auditing, and bookkeeping
- architectural, engineering, and other technical fields
- computer and data processing
- database and other information
- legal
- management, consulting, and public relations
- research, development, and testing

Unfortunately, published BEA data on affiliated trade are not disaggregated by specific BPT service and country of origin. While unaffiliated data provide this detail, they indicate that developed countries—particularly Canada, the United Kingdom, Japan, and Germany still account for over half of the U.S. imports of BPT services. In 2004, unaffiliated BPT services imported from India were \$528 million¹⁷, but still accounted for only 4.2 percent of total U.S. unaffiliated BPT imports.

A comparison of trade data trends, even with detailed, disaggregated data for specific services (e.g., intermediate services) from countries of origin, cannot distinguish the effects of off-shoring from other sources of import changes, such as shifts in relative demand, technological changes affecting relative prices, and cyclical changes. A recent report by the Organization for Economic Cooperation and Development (OECD) noted that “it remains difficult to interpret these data and link them to different sourcing activities. It is not possible to tell what share of these exports (of other business service from foreign countries to the U.S.) result from international sourcing activities.”¹⁸ Estimating the independent effects of off-shoring on the flow of services imports, even at a disaggregated level of analysis, requires more sophisticated econometric models that control for other economic factors affecting these import flows.

¹⁷ These BEA estimates of BPT imports from India differ substantially from Indian estimates. A recent GAO report – “U.S. and India data on Off-Shoring Show Significant Differences” GAO 06-116, October, 2005—has reviewed the key reasons for this estimation gap

¹⁸ Desiree VanWelsum and Graham Vickery. *Potential Off-Shoring of ICT-Intensive Using Occupations* (Paris: Organization for Economic Co-operation and Development Working Party on the Information Economy, April 5, 2005), 6.

Trade Benefits and Costs and Off-Shoring Implications

Economic literature on international trade acknowledges that trade involves both benefits and costs. Moreover, although most economists believe benefits from trade normally exceed costs in the aggregate, the benefits are often widely dispersed, while costs—principally initial direct loss of jobs from imports and associated economic impacts on individual workers, specific industries, and local communities—are frequently narrowly concentrated. Off-shoring employment effects are one significant and sensitive component in the debate over net benefits from trade and options to ameliorate the gross costs through various transfer mechanisms or other policies.

From an international trade perspective, off-shoring is consistent with historical U.S. efforts to liberalize trade rules, promote access to international markets, encourage greater flexibility and mobility of capital and labor, and secure efficiency gains expected from the expansion of international trade. Concerns about the net employment effects of off-shoring mirror similar concerns about the costs of trade imposed on those workers, firms, and communities adversely affected by job displacement, wage declines, business shutdowns, and secondary employment, income, and tax-base losses.

International-trade literature thus supports a broad, extensive assessment of the net employment effects of off-shoring, including estimates of the indirect, derived effects from income expansion and efficiency gains associated with increased trade. This tradition of assessing net job changes raises some unique data collection and measurement challenges, because trade data reflect only the value of goods and services traded, not labor and capital inputs required to produce those exports and imports. Estimates of these net employment changes from trade data also require econometric modeling.

The Domestic Labor-Market Perspective

Off-shoring employment effects also occur within a large and dynamic U.S. labor market historically perceived as a flexible and responsive generator of new jobs. Despite periodic cyclical interruptions, most recently the 2001 recession, the U.S. economy has supported substantial growth in total employment over time. Since 1980 total employment has increased over 41 million (45.3 percent) from 90.5 to 131.5 million in 2004. During the decades of the 1980s and 1990s total U.S. employment grew at an average annual rate of 1.9 percent. Between 2000 and 2004 total U.S. employment initially declined 1.9 million (1.4 percent) to its 2003 nadir and then increased 1.6 million in 2004 (1.2 percent), reflecting an abnormally slow employment recovery from the 2001 recession. The distribution of employment has changed substantially over the past two decades, with growth in services offsetting the long-run decline in manufacturing employment. Within services, employment in professional and business services and education and health services has more than doubled since 1980.

Long-term growth in total U.S. employment is determined primarily by macroeconomic policies supporting aggregate demand, population growth (including immigration), and changes in productivity. For a given industry or occupation, changes in average wages and total labor compensation reflect productivity growth and competitive conditions.

However, this positive trend in aggregate employment growth can mask some specific labor-market problems for specific groups. Benefits of aggregate job growth are not equally shared by all individuals; even within an expanding job market, some individuals encounter extended durations of long-term unemployment, stagnant wage growth, income loss, and inadequate health care and pension benefit coverage. A critical issue is the extent to which net job losses from off-shoring add to or even compound these structural labor-market problems.

Annual U.S. Job Losses and Off-Shoring

Another significant feature of the U.S. labor market is the substantial job turnover that occurs as new jobs are created and existing ones destroyed. While the extent of this churning of jobs is often cited as a positive example of the dynamic character and flexibility of the U.S. labor market, it also means that at any time a substantial number of workers are in the market seeking new jobs. Data from BLS' BED data series indicate that from 2002 quarterly gross job losses and gains have averaged between 7 and 8 million, with the gains exceeding the losses since the second quarter of 2003 (see Figure 2-4).

Figure 2-4
Private-Sector Gross Job Gains and Gross Job Losses, Total Private
(Seasonally Adjusted, 1992-2004)

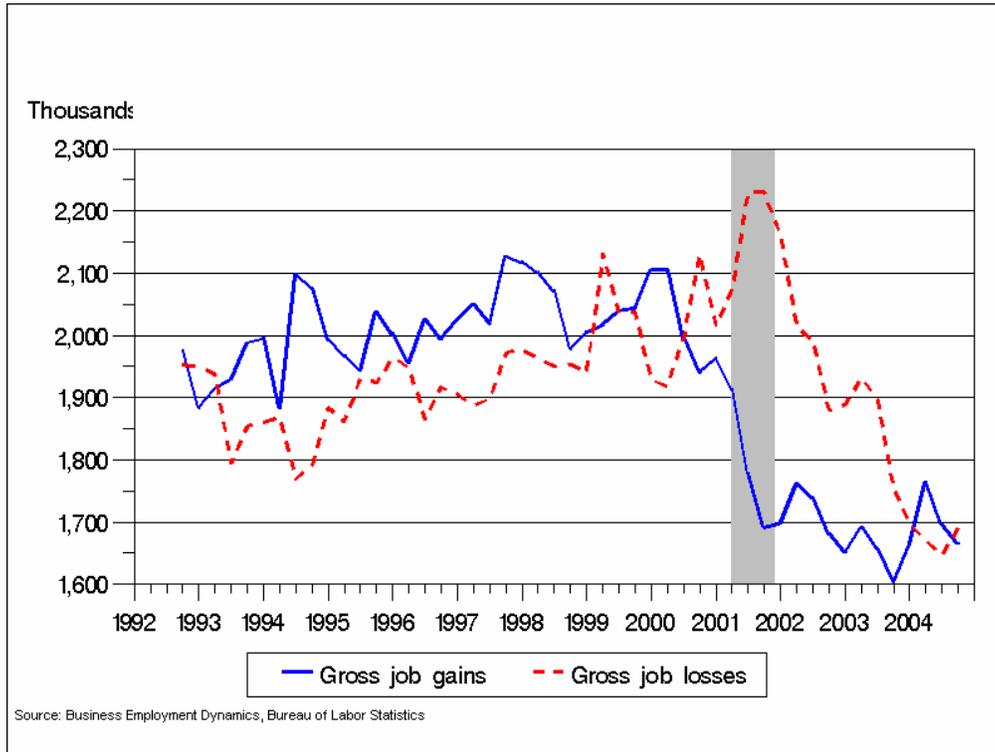


Note: Shaded area represents recession period.

Figure 2-4 also shows that the quarterly gross job gains during this period, while comparable to those during the early 1990s, are lower than the quarterly gains achieved from 1996 through 2000. Recent quarterly job losses have been comparable to those during the mid-1990s, and while lower than the higher losses occurring between 1999 and 2001, are higher than the losses from the early 1990s. While the closing of existing businesses and opening of new ones accounts for some of these substantial gross job gains and losses, most of them reflect expansions and contractions in employment within ongoing businesses.

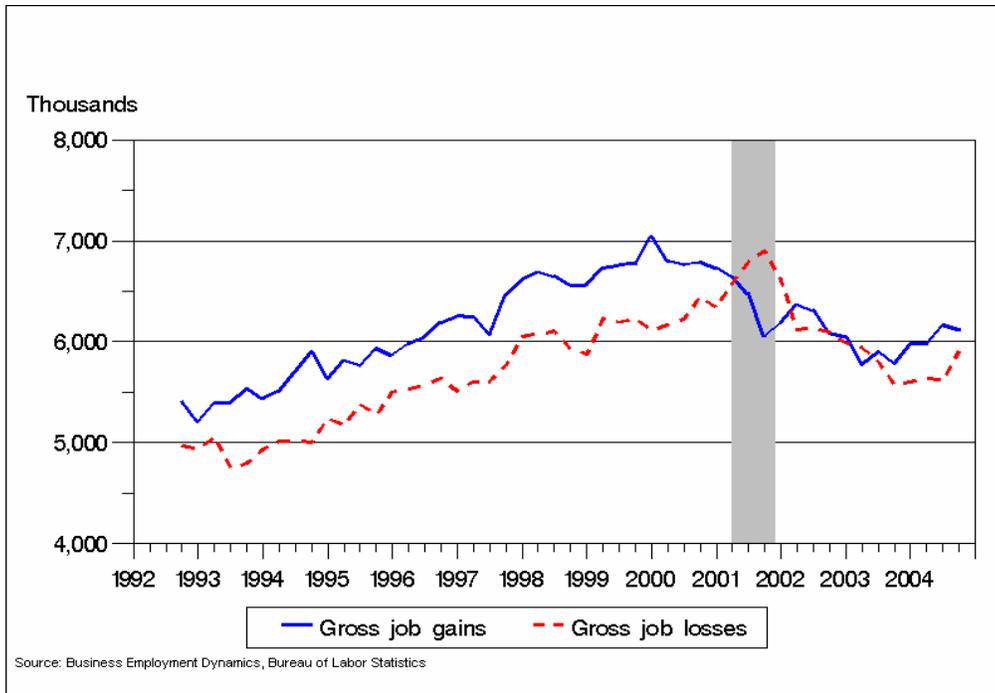
Figures 2-5 and 2-6 contain quarterly gross job gains and losses for two major sectors: goods-producing and service-providing industries.

Figure 2-5
Private-Sector Gross Job Gains and Gross Job Losses, Goods-Producing
(Seasonally Adjusted, September 1992-September 2004)



Note: Shaded area represents recession period.

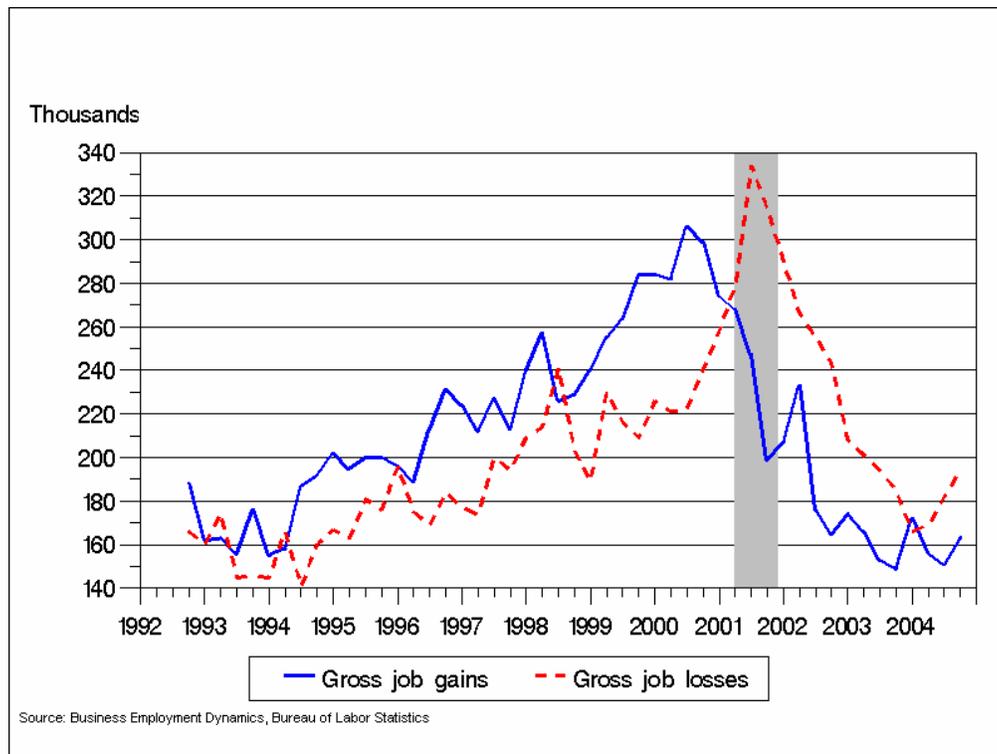
Figure 2-6
Private-Sector Gross Job Gains and Gross Job Losses, Service-Providing
(Seasonally Adjusted, September 1992-September 2004)



Note: Shaded area represents recession period.

These charts show the much greater volatility of job gains and losses in the goods-producing industries relative to the service-providing sectors. They also show the significant loss of goods-producing jobs since mid-2000, well in advance of the 2001 recession. The sharp drop in gross job gains since 2000—from 2 million or more a quarter from 1994 through 1999 to only 1.7 million a quarter or less since the last half of 2002—was a principal reason for this decline in total goods-producing employment. The contrast with job-gain and -loss trends for services, shown in Figure 2-6 is quite dramatic. Net employment declines for services were concentrated primarily in the second, third, and fourth quarters of 2001 during the recession and were driven by the increase in quarterly job losses. While quarterly job gains for services have fallen off from the high levels sustained between 1997 and 2000, they still average about 6 million a quarter—higher than the gains realized prior to 1996.

Figure 2-7
Private-Sector Gross Job Gains and Gross Job Losses, Information Services
(Seasonally Adjusted, September 1992-September 2004)



Note: Shaded area represents recession period.

A major exception to these differences in gross job gains and losses between services and goods-producing industries is the information services industry shown in Figure 2-7. Gross job gains and losses for information services appear much more similar to the flows for goods-producing industries. Quarterly job gains have fallen sharply from their peak in early 2000, and while quarterly job losses spiked in early 2001, they have fallen toward levels more comparable to the

mid-1990s. However, the quarterly losses exceeded quarterly gains for all but one quarter since 2001.

Figures 2-8 through 2-10 contain quarterly job-gain and -loss rates (as a percentage of total employment) for all private-sector employers and the goods-producing and service-providing sectors.

Figure 2-8
Job Gains and Job Losses, Total Private Sector
(Rate as Percent of Total Employment)

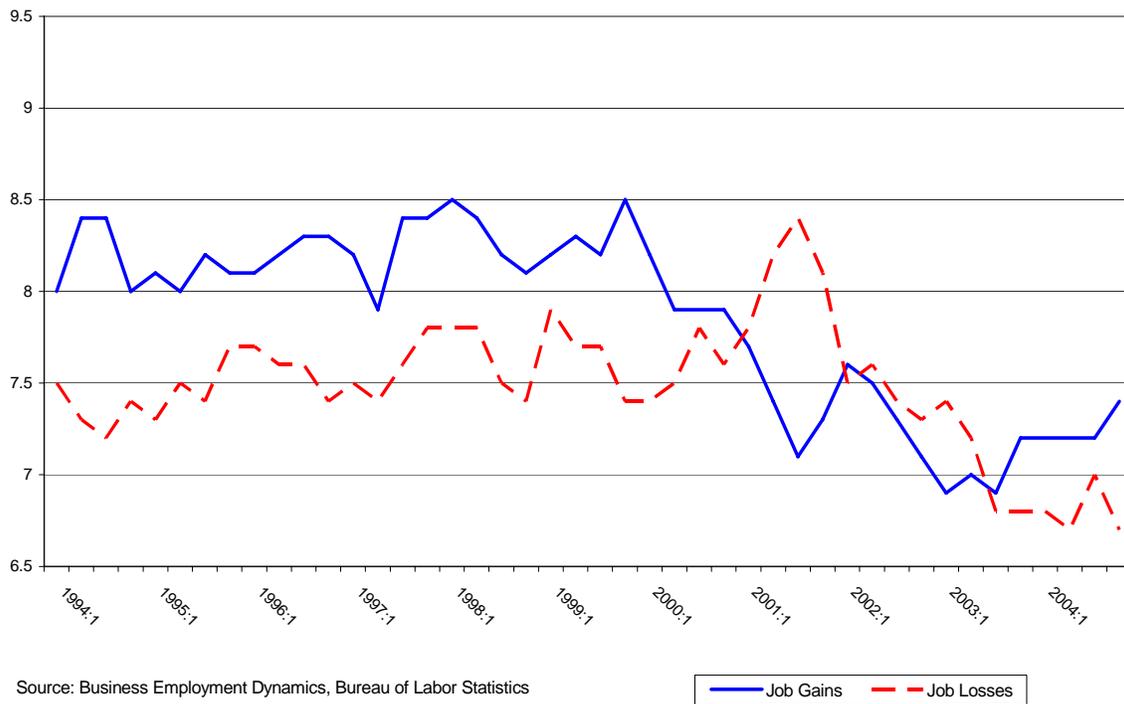


Figure 2-9
Job Gains and Job Losses, Goods-Producing Sector
(Rate as Percent of Total Employment)

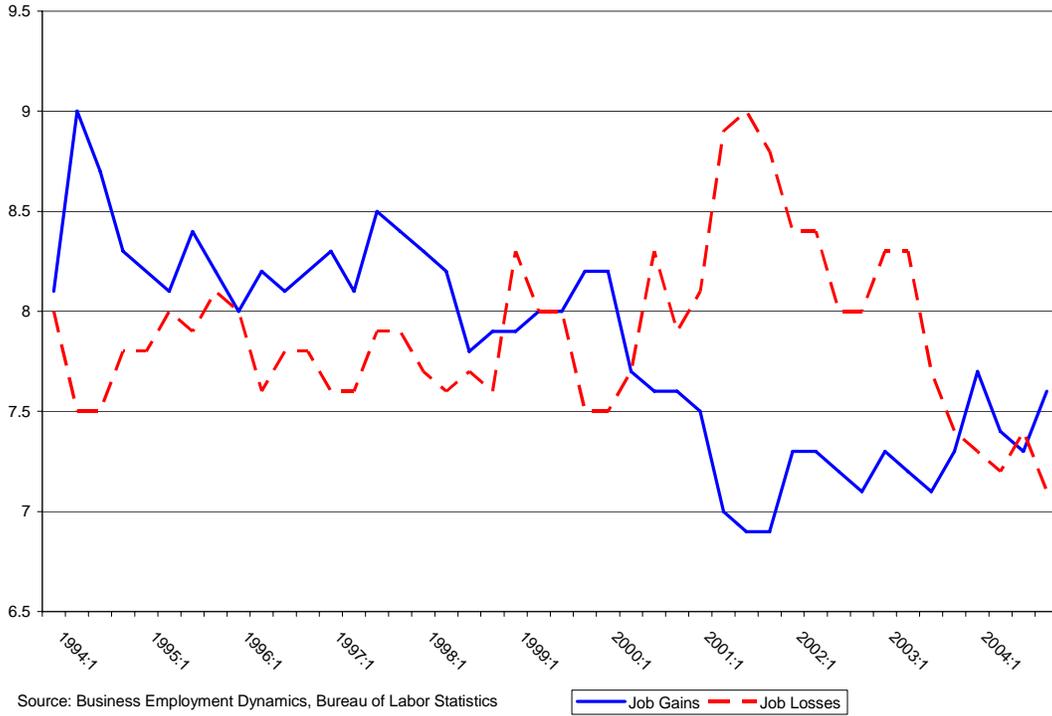
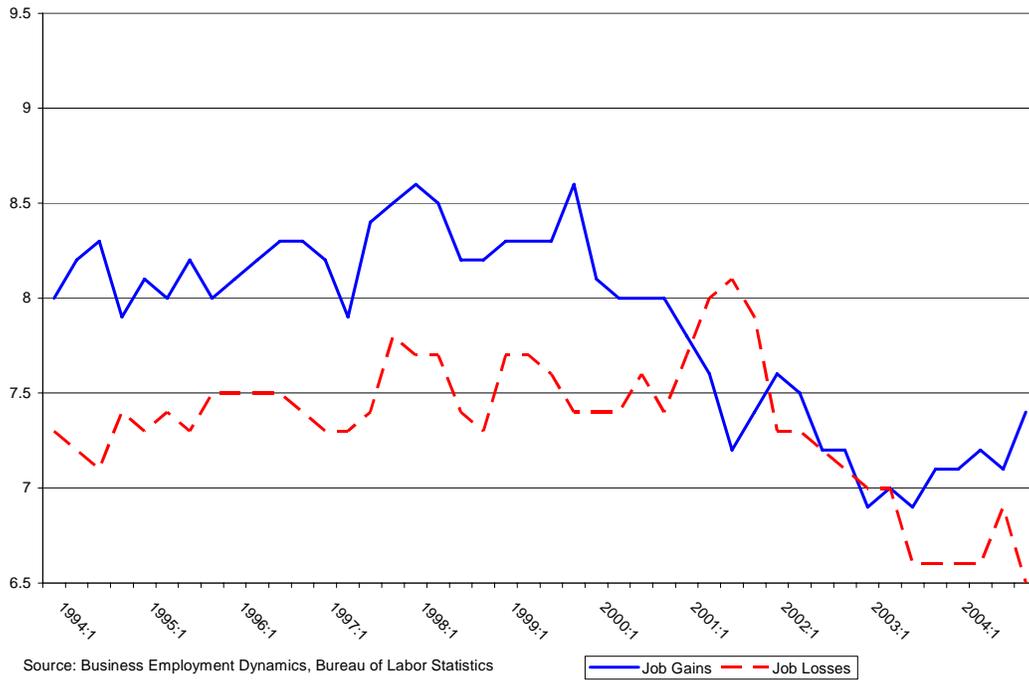


Figure 2-10
Job Gains and Job Losses, Service-Providing Sector
(Rate as Percent of Total Employment)



These BED data show the relatively consistent levels of job turnover over the last decade, even during cyclical downturns. Relative to total employment, quarterly job losses have ranged between 6.7 percent and 8.4 percent since 1994; quarterly job gains have ranged between 6.9 percent and 8.5 percent over this same period. During the 2001 recession, quarterly job losses increased from about 7.6 percent of total employment to a peak of 8.4 percent of total employment (third quarter of 2001), while quarterly job gains fell from 7.9 percent to 7.1 percent. However, even during the nadir of the 2001 recession, over 7.7 million new jobs were created (third quarter 2001).¹⁹

Figure 2-8 also depicts a decline in the rate of quarterly, gross job gains after the first quarter of 2001. From 1994 through early 2000, the rate usually exceeded 8 percent, but it has been consistently below 7.5 percent since the third quarter of 2002. The rate of gross job losses has also fallen since its recession peak; since the last half of 2003 it has been below 7 percent. It is not clear whether or how much off-shoring has contributed to this recent change.

These aggregate data on gross job gains and losses mask some significant differences in the data for different industries. Services industries (Figure 2-10) have consistently experienced lower rates of gross losses relative to goods-producing industries. Within goods-producing industries, the construction sector encounters the highest rates of job turnover, with the 2004 rate of construction job gains and losses averaging 11.87 percent and 11.27 percent, respectively. Among major services industries, professional and business services (8.93 percent gains, 8.33 percent losses) and leisure and hospitality (9.3 percent gains, 8.87 percent losses) had the highest rates of job turnover on average during 2004. Previous studies of off-shoring have identified the professional and business services sector as having some vulnerability to off-shoring. However, neither the construction nor the leisure and hospitality sectors were found to be susceptible to off-shoring employment losses. High rates of job turnover are not necessarily indicative of vulnerability to off-shoring

Assessing the Significance of Direct Short-Term Off-Shoring Job Losses

Several previous studies have compared their estimates of net employment effects from current off-shoring activities to this extensive and continuous job churning in the U.S. labor market. Relative to these substantial aggregate quarterly job gains and losses, most previous estimates of off-shoring employment effects appear minor.²⁰ However, more disaggregated industry data on gross job losses and gains might indicate a more significant off-shoring impact for particular industries. Of course, the relative size of job shifts due to off-shoring is not important to those who lose their jobs from off-shoring and bear the costs of adjusting to that loss. It is also important to identify potential sources of change in specific jobs when assessing the relative significance or insignificance of current off-shoring activity. The major sources of change appear to include the following:

¹⁹ Over 9 million jobs were lost during the second and third quarters of 2001.

²⁰ Table 4-3 in Chapter 4 summarizes these off-shoring employment estimates.

- temporary or transitory changes
- cyclical changes
- structural changes, of which some reflect
 - technological changes
 - shifts in demand
 - changes in terms of trade
 - business process changes

This last type of structural change—business-process change—includes job changes at specific establishments due to outsourcing decisions or relocations of parts of current business operations. Off-shoring activities are included within this category of structural changes. Unfortunately, BED data do not disaggregate gross job losses by these conceptual sources of job change.

Within this labor-market context, there are several reasons for distinguishing the direct, gross job losses from off-shoring activities from the net employment effects. First, and perhaps most important, these displaced workers bear the major adjustment costs from off-shoring activities and it is important to identify how many of them are displaced and how quickly and successfully they can adjust to the adverse conditions they face. Second, the size of direct, gross job losses from off-shoring relative to other structural sources of job losses will identify whether off-shoring is a major and growing source of these structural job losses, or not. Third, if the gross job losses from off-shoring have become more concentrated in specific occupations, industries, or regions, they may be more problematic than simple aggregate comparisons would suggest. Evaluating this possibility will require further analysis of more disaggregated BED data. Finally, off-shoring activities may have different derived or indirect employment effects than other structural sources of job changes. Because a number of derived employment effects are likely to reduce the net employment effects from off-shoring activities, these derived effects and any changes relative to direct effects will determine the relative importance of off-shoring activities among structural sources of job changes.

These direct short-term off-shoring job losses often also have a different time dimension than the net employment effects. Many indirect effects emerge over time, whereas those workers who lose their jobs due to off-shoring face immediate adjustment problems. The extent of these adjustment problems, their severity relative to adjustment problems from other sources of structural job losses, and their distribution among different economic and social groups will influence the need for particular policy responses. The net employment effects can indicate whether the gains from off-shoring outweigh the adjustment costs.

DISTINGUISHING CHARACTERISTICS OF CURRENT OFF-SHORING EFFECTS

From either an international-trade or domestic labor-market perspective, the extent of and adjustment to net job losses from off-shoring or other structural changes is not new. As Robert Atkinson of the Progressive Policy Institute has observed, “while the past is never fully prologue,

it is worth noting that our economy has faced similar kinds of challenges, and experienced similar kinds of reactions in the past.”²¹ A key issue is whether the scope, scale, characteristics, and implications of current off-shoring differ from previous incidents.

Several studies cite the role of technology in distinguishing the current off-shoring phenomenon from other structural changes or prior off-shoring activities. Recent technological changes—improvement in international telecommunications capacity, reduction in global telecommunications costs, and computerization and digitization of business services facilitated by personal computer improvements²²—have expanded the scope of potential job losses to a wider set of occupations and industries. At the same time, business-process restructuring appears to have reduced the scale of many outsourcing and relocation decisions by reengineering and disaggregating current business processes into smaller, discrete, and highly specialized components. How extensive and significant this shift toward service-sector, white-collar jobs is or will become remains unclear. Displaced white-collar service workers will still bear the adjustment costs of job losses due to off-shoring activities, but an important concern is whether their costs will be lower or greater than the adjustment costs born by blue-collar manufacturing workers in the past. To the extent these white-collar service workers are better educated and younger than their blue-collar counterparts, previous research suggests that their adjustment costs may be lower.²³

Another issue that may distinguish current off-shoring activities and their associated employment effects from similar past concerns is the impending retirement of the baby boomers and its impact on the long-run domestic labor supply, particularly for high-skilled labor. Off-shoring decisions reflect a number of considerations, including the availability of an adequate supply of high-skilled labor. Thus, off-shoring may be an alternative for addressing potential long-run domestic shortages for specific skills since it can relocate activities to areas where sufficient skilled labor exists. This has implications for immigration policy, particularly temporary worker programs—although these programs have been used primarily to meet short-term skill needs. The clearest and most recent example was the expansion in the H1B program to meet the short-term demand for computer programmers to address Y2K (Year 2000) programming issues. Off-shoring also has implications for the nation’s education and training system and its ability to meet long-run demands for high-skilled labor.

A final issue is the effect current off-shoring activities can have on the quality of skills that U.S. workers have relative to the skill needs of employers. As noted above, off-shoring activities can help address employer skill needs by relocating certain business processes and activities to areas where those skills are relatively abundant. On the other hand, job shifts create additional uncertainty about employers’ long-term demand for U.S. workers with specific skills. Again, there are clear implications for the nation’s education and training system, particularly the system’s flexibility and adaptability in meeting the labor market’s future skills needs.

²¹ Robert D. Atkinson, *PPI Policy Report: Understanding the Off-Shoring Challenge*, (Washington, D.C.: Progressive Policy Institute, May 2004), 12.

²² McKinsey Global Institute, *Off-Shoring: Is It a Win-Win Game?* p. 1.

²³ These conclusions reflect the key findings by Lori Kletzer in her 2001 book, *Job Loss from Imports: Measuring the Costs*.

CONCLUSIONS

This conceptual framework for assessing off-shoring issues suggests several tentative findings or conclusions. These will guide the Academy Panel's research for the next phases of this off-shoring review.

- Off-shoring activities are highly complex due to the following:
 - reasons for locating activities overseas
 - range of potential direct and indirect economic effects, especially for employment
 - two different trade and labor-market dimensions
- Off-shoring's complexity complicates estimation and measurement efforts.
- The lack of a commonly accepted definition for off-shoring adds to these difficulties.
- A complete assessment of off-shoring involves estimating its direct and indirect economic effects, particularly for employment, and that requires the use of economic models.
- Assessing the significance of off-shoring activities requires both trade and labor-market perspectives, including combining data from each dimension.
- From a trade perspective, the direct effects of off-shoring should increase imports, but the effect on exports is less certain.
- From a labor-market perspective, off-shoring is one of the structural sources of job shifts in a dynamic labor market that creates and destroys between 7 and 8 million jobs a quarter.
 - Assessing the significance of any off-shoring job shifts relative to those from other sources requires disaggregated analysis of BLS' BED and other data.
 - Even if aggregate impacts appear small, the distributional effects of off-shoring can still be severe and therefore significant for individuals, industries, and communities that bear them.
 - The costs imposed by job dislocations cannot be ignored.
- Adjustment problems of workers displaced by off-shoring are important from both perspectives; employment estimates need to distinguish direct from indirect effects.

- The current off-shoring phenomenon has widened the types of jobs that are potentially vulnerable to international trade competition to include some white-collar service jobs. The extent of this change and its economic significance are still unclear.

Table 2-1: Trade in Private Services by Type, 1992-2004 (Millions of Dollars)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Imports												
Total Private Services	103,469	109,439	120,280	128,731	138,806	151,463	165,642	183,034	207,392	204,074	209,235	224,616	258,069
Unaffiliated	90,428	95,375	103,896	109,841	117,852	127,234	137,983	147,137	167,280	162,664	164,212	176,042	203,376
Affiliated	13,036	14,063	16,384	18,890	20,954	24,229	27,659	35,897	40,112	41,410	45,023	48,574	54,693
Travel ¹	38,552	40,713	43,782	44,916	48,078	52,051	56,483	58,963	64,705	60,200	58,715	57,444	65,635
Passenger fares ²	10,603	11,410	13,062	14,663	15,809	18,138	19,971	21,315	24,274	22,633	19,969	20,957	23,701
Other transportation	23,767	24,524	26,019	27,034	27,403	28,959	30,363	34,139	41,425	38,682	38,407	44,705	54,169
Unaffiliated	n.a.	n.a.	n.a.	n.a.	n.a.	28,559	29,963	33,739	41,025	38,182	37,707	43,505	52,669
Affiliated	n.a.	n.a.	n.a.	n.a.	n.a.	400	400	400	400	500	700	1,200	1,500
Royalties and license fees	5,161	5,032	5,852	6,919	7,837	9,161	11,235	13,107	16,468	16,538	19,335	19,390	23,901
Unaffiliated	1,766	1,646	1,919	1,663	2,431	2,412	2,688	2,733	3,932	3,297	4,219	3,707	5,151
Affiliated	3,396	3,386	3,933	5,256	5,406	6,749	8,547	10,374	12,536	13,241	15,116	15,683	18,750
Other private services	25,386	27,760	31,565	35,199	39,679	43,154	47,590	55,510	60,520	66,021	72,809	82,120	90,663
Unaffiliated	15,740	17,082	19,114	21,565	24,131	26,074	28,878	30,387	33,344	38,352	43,602	50,429	56,220
Affiliated	9,640	10,677	12,451	13,634	15,548	17,080	18,712	25,123	27,176	27,669	29,207	31,691	34,443
Education ³	767	857	972	1,125	1,253	1,396	1,587	1,807	2,031	2,298	2,701	3,184	3,525
Financial services	n.a.	n.a.	n.a.	n.a.	n.a.	6,147	7,790	9,418	12,040	11,189	9,560	9,832	11,168
Unaffiliated	986	1,371	1,654	2,472	2,907	3,347	3,590	3,418	4,840	4,489	4,160	4,232	4,968
Affiliated	(14)	(14)	(14)	(14)	(14)	2,800	4,200	6,000	7,200	6,700	5,400	5,600	6,200
Insurance services ⁴	4,221	4,402	5,029	5,126	5,395	5,891	7,957	9,389	11,284	16,706	22,150	26,561	29,882
Telecommunications ⁵	6,052	6,365	6,928	7,305	8,290	8,346	7,682	6,601	5,428	4,770	4,233	4,259	4,365
Business, professional, and technical services	n.a.	n.a.	n.a.	n.a.	n.a.	20,814	22,023	27,636	29,098	30,418	33,492	37,464	40,737
Unaffiliated	3,216	3,618	3,982	4,940	5,670	6,539	7,531	8,589	9,129	9,452	9,688	11,393	12,519
Affiliated	(14)	(14)	(14)	(14)	(14)	14,275	14,492	19,047	19,969	20,966	23,804	26,071	28,218
Computer and information services ⁶	n.a.	n.a.	n.a.	n.a.	n.a.	1,564	1,969	4,494	4,435	4,599	4,554	5,706	5,804
Unaffiliated	143	211	224	286	422	764	1,069	1,494	1,835	1,799	1,654	2,206	2,004
Affiliated	(14)	(14)	(14)	(14)	(14)	800	900	3,000	2,600	2,800	2,900	3,500	3,800
Management and consulting services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2,630	3,517	3,982	5,023
Unaffiliated	243	287	321	465	497	687	872	842	702	830	917	1,182	1,523
Affiliated	(14)	(14)	(14)	(14)	(14)	(15)	(15)	(15)	(15)	1,800	2,600	2,800	3,500
Research and development and testing services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2,425	2,628	4,427	4,727
Unaffiliated	225	239	294	364	379	564	637	749	787	725	1,028	1,327	1,827
Affiliated	(14)	(14)	(14)	(14)	(14)	(15)	(15)	(15)	(15)	1,700	1,600	3,100	2,900
Operational leasing	n.a.	n.a.	n.a.	n.a.	n.a.	1,084	1,122	1,224	1,223	1,154	1,003	825	1,184
Unaffiliated	337	356	401	407	325	189	175	173	188	199	171	158	161
Affiliated	(14)	(14)	(14)	(14)	(14)	895	947	1,051	1,035	955	832	667	1,023

Table 2-1. Trade in Private Services by Type, 1992-2004
(Millions of Dollars) (continued)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Imports													
Other business, professional, and technical services	n.a.	n.a.	n.a.	n.a.	n.a.	16,914	17,425	20,324	21,950	19,609	21,790	22,525	24,000
Unaffiliated	2,269	2,523	2,742	3,422	4,047	4,334	4,780	5,328	5,616	5,898	5,918	6,521	7,005
Affiliated ⁷	(14)	(14)	(14)	(14)	(14)	12,580	12,645	14,996	16,334	13,711	15,872	16,004	16,995
Other services	498	481	582	625	623	560	550	659	639	639	674	821	987
Unaffiliated	498	469	550	597	616	555	530	583	632	636	671	801	962
Affiliated	(*)	12	32	28	7	5	20	76	7	3	3	20	25
Film and television tape rentals	76	74	166	196	183	158	141	195	137	124	140	229	341
Unaffiliated	76	62	134	168	176	153	121	119	130	121	137	209	316
Affiliated	(*)	12	32	28	7	5	20	76	7	3	3	20	25
Other	422	407	416	429	440	402	409	464	502	515	534	592	646
Unaffiliated	422	407	416	429	440	402	409	464	502	515	534	592	646
Affiliated	.	.	.	.	.	.	.	.	.	.	.	.	.
Addenda: Detail on transactions with unaffiliated foreigners in other business, professional, and technical services: ⁸	2,269	2,523	2,742	3,422	4,047	4,334	4,780	5,328	5,616	5,898	5,918	6,521	7,005
Accounting, auditing, and bookkeeping services	104	103	130	170	218	279	403	592	531	507	489	568	720
Advertising	450	646	728	833	971	773	912	881	909	1,027	786	863	923
Agricultural, mining, and on-site processing services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	301	259	304	350	283	366	512
Agricultural and mining services ⁹	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	301	259	304	347	267	349	494
Waste treatment and depollution services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3	16	17	18
Architectural, engineering, and other technical services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	54	19	18	66	112	71	88
Construction, architectural, engineering, and mining services ¹⁰	261	319	280	345	465	463	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Construction	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	208	237	184	179	204	241	374
Industrial engineering	112	142	100	160	197	211	206	262	241	148	183	195	162
Installation, maintenance, and repair of equipment	191	175	164	160	239	307	242	315	821	566	668	675	673
Legal services	311	321	383	469	615	539	655	742	893	740	820	926	754
Medical services	114	114	114	118	123	132	139	141	156	157	153	167	185
Miscellaneous disbursements ¹¹	395	371	538	843	750	1,075	1,136	1,351	1,120	1,361	1,481	1,638	1,599
Sports and performing arts	145	156	122	120	200	260	228	206	85	168	110	121	160
Trade-related services ¹²	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	31	48	71	92
Training services	101	101	137	145	140	153	168	162	205	346	370	401	510
Other business, professional and technical services ¹³	85	75	46	59	129	142	128	163	149	252	211	218	253

Source: Bureau of Economic Analysis

NOTES:

n.a. Not available

* Less than \$500,000.

1. Travel consists of expenditures by individuals who travel to foreign countries, so these transactions are between unaffiliated parties.
2. Passenger fares consist of fares paid by residents of one country to airline and vessel operators (carriers) that reside in another country, so they are transactions between unaffiliated parties.
3. Education consists of expenditures for tuition and living expenses by students studying in foreign countries, so these transactions are between unaffiliated parties. The small affiliated portion of education is included in “other business, professional, and technical services.”
4. Most insurance services transactions are deemed to be unaffiliated, even when they are between affiliated companies, because the services are deemed to be provided to the policyholders who pay the insurance premiums and who are unaffiliated with either company. Only primary insurance transactions between a U.S. company that is not an insurance company and an affiliated foreign insurance company, such as a captive foreign insurance affiliate, are considered to be affiliated. Data on affiliated trade in insurance services are included in affiliated “their business, professional, and technical services.”
5. Transactions in basic telecommunications services are deemed to be unaffiliated even when the services flow through affiliated channels, because they represent the distribution of revenues collected from unaffiliated customers. Other types of telecommunications services that flow through unaffiliated channels are included in “telecommunications,” and services that flow through affiliated channels are included in affiliated “other business, professional, and technical services.”
6. Includes computer and data processing services and database and other information services.
7. See footnotes 4 and 5. For 1992-2000, this category also included affiliated management and consulting services and research and development and testing services.
8. Only data on transactions with unaffiliated foreign persons are identifiable.
9. For 1992-1997, mining services are included in construction, architectural, engineering, and mining services; agricultural services are included in “other business, professional, and technical services.”
10. For 1998-2003, mining services are included in agricultural and mining services; the other services are included in “architectural, engineering, and other technical services” and in construction services.
11. Miscellaneous disbursements include transactions such as outlays to fund news-gathering costs of broadcasters and of print media, to fund production costs of motion pictures and other broadcasts, and to maintain government tourism and business promotion offices.
12. Trade-related services consist of auction services, Internet or online sales services, and services provided by independent sales agents. For exports, “merchanting” services are also included; these exports are measured as the difference between the cost and resale prices of goods that are purchased and resold abroad without significant processing. For imports, the value of these services is included in the value of the goods. Merchanting services have been collected since 1996, and other trade

related services have been collected since 2001. Merchanting services exports were \$138 million in 2002 and \$126 million in 2003.

13. "Other business, professional, and technical services" consists of language translation services; security services; collection services; salvage services; satellite photography and remote sensing/satellite imagery services; transcription services; mailing, reproduction, and commercial art services; personnel supply services; and management of health care facilities services. See also footnote 9.
14. For 1992-1996, affiliated transactions in this service were not separately available; they were included in affiliated "other private services."
15. For 1997-2000, affiliated transactions in this service were included in "other business, professional, and technical services"

CHAPTER 3

ALTERNATIVE DEFINITIONS OF OFF-SHORING

There is neither a clear, universally accepted definition of what constitutes off-shoring, nor agreement on a term of reference. A comprehensive literature review on off-shoring confirms the absence of a standard definition and terminology.

After reviewing the literature, the Panel believes that the terminology needs to be simplified to improve clarity and understanding of off-shoring issues. The Panel suggests that three key terms be used to describe various aspects of off-shoring activity—“outsourcing,” “off-shoring,” and “off-shore outsourcing”—and recommends definitions for each term. The Panel notes that “in-shoring” is another important term relevant to any assessment of U.S. off-shoring.

The Panel identified four selection criteria in choosing its definition of off-shoring:

- 1) clearly understood
- 2) clearly differentiable from other sources of employment change
- 3) consistent through time
- 4) policy relevant

The first section of this chapter discusses multiple off-shoring terminologies used. The second section reviews the wide array of off-shoring definitions, describes what is included and excluded, and classifies them accordingly. The final section explains how the Panel applied its selection criteria to determine the definition of off-shoring.

MULTIPLE OFF-SHORING TERMINOLOGY

Currently, there are multiple terms to describe various definitions of off-shoring. The terms most widely used are “outsourcing,” “off-shore outsourcing,” and “off-shoring,” while others use “international sourcing” or “global resourcing.”

Outsourcing, Off-Shore Outsourcing, and Off-Shoring

Building on Hira’s work, the May 2004 white paper from the Office of Senator Joseph I. Lieberman distinguishes between “off-shoring,” “outsourcing,” and “off-shore outsourcing.”²⁴ According to the Lieberman paper, off-shoring “is used to describe multinational corporations

²⁴ Lieberman staff define these terms according to those found in Ron Hira’s 2004 paper, “Implications of Off-shore Outsourcing,” submitted for the Globalization, Employment, and Economic Development Workshop, a Sloan Workshop Series in Industry Studies held in January 2004.

relocating work from their domestic sites to foreign locations.”²⁵ This definition is limited to MNCs and thus excludes those firms without foreign affiliates relocating work to unaffiliated firms located outside the United States. The definition also requires direct substitution of work performed in the United States with work performed at a foreign location, thus excluding job opportunities lost due to forgone domestic expansion or future export growth.

Lieberman’s staff defines outsourcing as “a generic term used when companies contract out certain business functions to an external supplier, eliminating the need to maintain an internal staff necessary to perform that function,” and off-shore outsourcing as “the contracting of these business functions to companies in lower-cost areas, primarily in developing nations.”²⁶ The distinction between outsourcing and off-shore outsourcing is the geographic location of the unaffiliated supplier. Off-shore outsourcing is limited to contracted unaffiliated suppliers located in lower-cost, primarily developing nations, outside the United States. This limitation raises questions about what constitutes a low-cost country and where dividing lines fall between developed and developing nations. Also, the distinction between low-cost and high-cost overseas locations creates ambiguity about decisions by U.S. firms to outsource business activities to unaffiliated firms located in high-cost, developed countries—e.g., England and Japan. If this is not also “off-shore outsourcing,” what is it and how does it differ from the Hira and Lieberman staff definition?

Bhagwhati, Panagariya, and Srinivasan define off-shore outsourcing as unaffiliated firms located outside national boundaries of the buyer in the transaction, but do not limit their definition to low-cost, primarily developing nations. They reviewed the four modes of production developed by the WTO under its General Agreement on Trade in Services (GATS), suggesting that the WTO “Mode 1” concept of off-shore trade in unaffiliated services, where both buyer and seller remain in their respective locations outside the other’s national boundaries, was the most appropriate definition of services outsourcing to off-shore entities. Their definition of off-shore outsourcing does not include direct foreign investment by firms.²⁷

International Sourcing

According to van Welsum and Vickery, off-shoring is “international sourcing,” comprised of “international in-sourcing” and “international outsourcing.” They use the terms “in-sourcing” and “outsourcing” to signify the “control” of the service supplied, with “in-sourcing” referring to services that are supplied internally, and “outsourcing” referring to services from an external supplier. Van Welsum and Vickery add the qualifiers “domestic” and “international,” to describe the “location” of the supplied service. The terms used to define off-shoring are “international in-sourcing,” “giving rise to foreign direct investment and affiliated trade in services,” and “international outsourcing,” “giving rise to unaffiliated trade in services.”²⁸

²⁵ Office of U.S. Senator Joseph I. Lieberman, *Off-shore Outsourcing and America’s Competitive Edge: Losing Out in the High Technology R&D and Services Sectors*, May 2004, p. 7.

²⁶ *Ibid.*

²⁷ Jagdish Bhagwhati, Arvind Panagariya, and T.N. Srinivasan, “The Muddles Over Outsourcing,” *Journal of Economic Perspectives*, vol. 18, no. 4 (Fall 2004): 96.

²⁸ VanWelsum and Vickery, *Potential Off-Shoring*, 6.

Figure 3-1
Off-Shoring, Outsourcing, and In-Sourcing—An Illustrative Matrix



Source: OECD.

Global Resourcing

The McKinsey Global Institute (MGI) uses “global resourcing” to describe “the process a company goes through to decide which of its activities could be performed anywhere in the world, where to locate them, and who will do them.”²⁹ Any activity not needing customer contact or local knowledge to be performed, or is not constrained by a system of complex interactions, can be globally resourced to any location outside the United States the company deems most appropriate.³⁰

Similar to van Welsum and Vickery, MGI defines off-shoring in terms of “control” and “location.” However, with regards to control, MGI refers to “captive” as a wholly owned affiliated unit where resourced activities are performed, and “outsourcing” as the practice by which the company buys resourced activities from an unaffiliated supplier.³¹ MGI’s terms “off-shore” and “on-shore” differ from those of van Welsum and Vickery, with “off-shore” referring to those services a company decides to have performed in “another country outside the market where they are sold,” and “on-shore” as those services a company decides to have performed “in the same market in which it sells them.”³² Thus, the terms used by MGI to define off-shored services are “captive off-shoring” and “off-shore outsourcing.”³³ MGI’s captive off-shoring definition includes only wholly owned affiliated units, excluding partially owned U.S. affiliates and all unaffiliated firms. MGI’s off-shore outsourcing definition includes only unaffiliated suppliers, excluding all U.S. affiliates. Both definitions exclude resourced activities that are performed outside the United States and serve the foreign market in which they are located.

²⁹ McKinsey Global Institute, *The Emerging Global Labor Market* (San Francisco: MGI, June 2005), 14.

³⁰ *Ibid.*

³¹ *Ibid.*, 16.

³² *Ibid.*, 14, 16.

³³ *Ibid.*, 15.

The Panel's Choice of Terms

The Panel finds the multiplicity of terms currently used to describe various aspects of off-shoring activity complex. **The Panel suggests that three key terms be used: “outsourcing,” “off-shoring,” and “off-shore outsourcing.” The Panel recommends they be defined as follows:**

- **Outsourcing—firms contracting out service and manufacturing activities to unaffiliated firms located either domestically or in foreign countries**
- **Off-shoring—U.S. firms shifting service and manufacturing activities abroad to unaffiliated firms or their own affiliates**
- **Off-shore outsourcing—a subset of both outsourcing and off-shoring in that it refers only to those service and manufacturing activities of U.S. companies performed in unaffiliated firms located abroad**

Because off-shoring is not unique to the United States, “in-shoring” is commonly used to reflect the foreign counterpart of U.S. off-shoring. Thus, **“in-shoring” should be defined as “foreign firms shifting service and manufacturing activities to the United States to either unaffiliated firms or their own affiliates.”**

ALTERNATIVE OFF-SHORING DEFINITIONS

With a variety of distinctions, off-shoring has been generally defined as either a substitution of imported goods and services for domestic inputs by U.S. firms or as the movement of production and related jobs to off-shore locations of affiliates of U.S. MNCs or unaffiliated firms through direct foreign investment and outsourcing practices, respectively. Despite differences, most definitions focus on the displacement of U.S. employment and production and imply an increase in U.S. imports.

Import Substitution Definitions

The broadest off-shoring definition in the import substitution category includes U.S. firms shifting purchases of both intermediate and final goods and services from domestic sources to unaffiliated foreign suppliers and U.S. foreign affiliates³⁴, in turn displacing domestic workers and production. In some cases, the definition is limited to intermediate goods and services imports. Import substitution definitions typically limit the shifting of activities and related jobs from U.S. firms located domestically to unaffiliated firms and U.S. foreign affiliates located abroad that supply U.S. imports, and in turn exclude those firms supplying foreign markets.

Definition Limited to U.S. Imports

The GAO defines off-shoring of services in an import substitution context, defining it as “an organization’s purchases from abroad (imports) of services that it previously produced in-house

³⁴ In this report, the term U.S. foreign affiliate refers to an affiliate of a U.S. MNC located in a foreign country.

or purchased from another domestic source.”³⁵ GAO includes purchases of imported services, both intermediate and final, from foreign affiliates and unaffiliated firms, but excludes any services imports that do not directly replace services that were previously produced in-house or from unaffiliated domestic suppliers. The GAO definition thus excludes U.S. job opportunities lost due to growing imports from U.S. firms expanding their operations abroad. Because the definition is limited to imports, job opportunities lost due to foregone exports from U.S. foreign affiliates or U.S. contracted unaffiliated firms supplying foreign markets are also excluded.

Definition Limited to Intermediate U.S. Imports

Bardhan and Jaffee define “off-shore outsourcing” as “using imported inputs, from both arms-length firms and affiliates in foreign countries.”³⁶ Their definition of off-shore outsourcing includes firms shifting their purchases of intermediate goods and services to affiliated and unaffiliated suppliers located outside the United States, as well as job opportunities lost due to imports replacing intermediate goods and services that otherwise could have been produced domestically. Bardhan and Jaffee limit their definition to intermediate goods and services, thus excluding final goods and services imports. Again, because the definition is limited to imports, U.S. job opportunities lost due to forgone exports from U.S. foreign affiliates or U.S. contracted unaffiliated firms supplying foreign markets are excluded.

Relocation Definitions

The broadest off-shoring definition focusing on *relocation* includes U.S. firms moving the production of goods and services, either intermediate or final, and related jobs to unaffiliated firms and U.S. foreign affiliates located outside the United States. These unaffiliated and affiliated firms either supply imports to U.S. markets, or supply foreign markets, including the market in which the firm is located. In some cases, the definition is limited to the relocation of part of a firm’s production process, but the most significant disagreement involves whether U.S. foreign affiliates directly supplying foreign markets should be included in the definition. Some argue that U.S. foreign affiliates are not off-shoring if they relocate production and related jobs to overseas locations to directly supply the market in which they are located, because these markets would not otherwise be served if the move had not taken place. Other definitions include overseas relocations that directly supply the market in which the unaffiliated or U.S. foreign affiliate is located, because some U.S. exports and related jobs are lost to the relocation. Relocation definitions are limited to a single event, and in turn, exclude job opportunities lost due to growing imports and forgone exports resulting from growth in foreign markets following relocation.

³⁵ United States Government Accountability Office, *Current Government Data Provide Limited Insight into Off-Shoring of Services* (Washington, D.C.: GAO, September 2004), 2. Note that this definition can be extended to include goods; however, the focus of the GAO study was on services.

³⁶ Ashok Deo Bardhan and Dwight Jaffee, *On Intra-Firm Trade and Multinationals: Foreign Outsourcing and Off-shoring in Manufacturing* (Berkeley, California: Haas School of Business, University of California Berkeley, April 2004), 2.

Single-Event Limitations

Van Welsum and Vickery suggest that there is a time element to the off-shoring phenomenon in that it can be unclear when off-shoring ceases to be off-shoring, and when it becomes just another transaction occurring in a foreign location.³⁷ Definitions including relocation of production and related jobs to locations outside the United States imply that off-shoring is a single event that includes only actual displacement of U.S. workers from an initial movement of production to a foreign location. Thus, off-shoring definitions employing this single event concept include the initial relocation of production and related jobs to unaffiliated firms and U.S. foreign affiliates located abroad that serve either U.S. or foreign markets, but exclude job opportunities lost due to growing imports and forgone exports resulting from growth in foreign markets following the initial relocation.

Garner of the Federal Reserve Bank of Kansas defines off-shoring broadly, focusing on the movement of production and related jobs to off-shore locations: “the term “off-shoring” refers to the relocation of jobs and production to a foreign country. The relocated jobs and production could be at a foreign office of the same multinational company or at a separate company located abroad.”³⁸ This definition includes U.S. firms moving production and related jobs to unaffiliated firms and U.S. foreign affiliates located outside the United States. Because Garner defines off-shoring in terms of relocation of production and related jobs, his definition is limited to a single event, excluding job opportunities lost due to growing imports and forgone exports resulting from U.S. firms expanding their operations abroad.

In its MLS survey, BLS also uses a broad definition for off-shoring to distinguish those movements of work from others occurring within the United States. As Sharon Brown has noted, “the BLS decided to use the MLS program as the vehicle for collecting additional information on what is usually referred to as “outsourcing” and “off-shoring.” In doing so, the following definitions were used.

- “Outsourcing” is the movement of work that was formerly conducted in-house by employees paid directly by a company to a different company. The different company can be located inside or outside of the U.S. The work can occur at a different geographic location or remain on-site.
- “Off-shoring” is the movement of work from within the U.S. to locations outside of the U.S. “Off-shoring” can occur within the same company and involve movement of work to a different location of that company outside of the U.S., or to a different company altogether (off-shoring/outsourcing).”³⁹

³⁷ VanWelsum and Vickery, *Potential Off-Shoring*, 6.

³⁸ C. Alan Garner, “Off-Shoring in the Service Sector: Economic Impact and Policy Issues,” *Economic Review* (Third Quarter, 2004): 6.

³⁹ Sharon P. Brown, “*Mass Layoff Statistics Data in the United States and Domestic and Overseas Relocation*,”(E.U.-U.S. Seminar on “Off-shoring of Services in ICT and Related Services,” Brussels, Belgium, December 13-14, 2004. p.4.

The MLS applies this broad definition to only certain off-shoring activities. The survey excludes small firms (employing fewer than 50 workers) and small layoff events—those involving less than 50 workers over a 5 week period. Most importantly, there must be a large layoff event. Off-shoring activities that do not involve direct job losses are not included.

Definition Limited to a Single Relocation Event Combined with the Movement of Portions of a Firm’s Production Chain

Grossman of Princeton University defines off-shoring as the migration of portions of the production chain to foreign locations. Off-shoring differs from overall import substitution because it reflects a more specific fragmentation or segmentation of the production process, more akin to overall outsourcing of production decisions made domestically.⁴⁰ Similarly, the Department of Commerce’s Technology Administration (TA) broadly defines off-shoring as “the relocation of a whole process, a piece of a process, a function, or a discrete piece of work outside the geographic boundaries of the United States. Work can be done in an off-shore location either within the boundaries of the company or outside the boundaries of the company.”⁴¹ Both definitions include the relocation of portions of a firm’s production chain to foreign locations; however, unlike Grossman’s definition, the TA’s definition specifies that this relocation can go to either an unaffiliated firm or a U.S. foreign affiliate located outside the United States. Both definitions are also limited to a single relocation event, thereby excluding job opportunities lost due to growing imports and forgone exports resulting from growth in foreign markets following the initial relocation.

Definition Limited to a Single Relocation Event and U.S. Imports

The U.S. Chamber of Commerce refers to off-shoring as “worldwide sourcing,” defining it as the process by which a company relocates production to another country outside the United States, excluding the investments and jobs U.S. firms place overseas in order to sell products or serve customers in foreign markets.⁴² Behraves of Global Insight uses the term “global sourcing,” defining it as transferring a particular activity that was previously performed in-house, to U.S. foreign affiliates and unaffiliated firms located outside the United States that produce goods or services for import to the United States.⁴³ Both definitions specifically state that a firm is not engaging in off-shoring practices if it chooses to relocate any of its activities outside the geographic boundaries of the United States in order to supply foreign markets. Thus, both definitions are limited to U.S. imports and to a single relocation event.

⁴⁰ Gene Grossman, “Session 4: Outline of Key Questions and Puzzles,” in *Summary of the Brookings Data Workshop: Services Off-Shoring: What Do the Data Tell Us, Held June 22, 2004* (Washington, D.C.: The Brookings Institution, October 2004), 2. <http://www.brookings.edu/pge/20040622summaryfinal.pdf>

⁴¹ Department of Commerce, Technology Administration (TA), *Assessment of the Extent and Implications of Workforce Globalization in Knowledge-Based Industries* (Washington, D.C.: Commerce, TA, July 2004), 4.

⁴² U.S. Chamber of Commerce, *Jobs, Trade, Sourcing, and the Future of the American Workforce* (Washington, D.C.: U.S. Chamber of Commerce, April 2004), 10.

⁴³ Nariman Behraves, chief economist of Global Insight, interview by National Academy of Public Administration staff, on the Global Insight paper written for the ITAA, *The Comprehensive Impact of Off-Shore IT Software and Services Outsourcing on the U.S. Economy and the IT Industry*, Washington, D.C., May 4, 2005.

THE PANEL'S DEFINITION OF OFF-SHORING

Following careful review of a wide range of off-shoring definitions, **the Panel identified four selection criteria in choosing its definition of off-shoring:**

- 1) **clearly understood**
- 2) **clearly differentiable from other sources of employment change**
- 3) **consistent through time**
- 4) **policy relevant**

Taking into account its criteria, the **Panel recommends defining off-shoring as follows:**

U.S. firms shifting service and manufacturing activities abroad to unaffiliated firms or their own affiliates

This definition is broader than most of the definitions currently used and is similar to the BLS definition for movement of work to an overseas location used in the MLS survey and TA's definition, except that it is not limited to a single relocation event and does not presume direct job losses. The Panel's broad definition satisfies the four selection criteria.

1) Clearly Understood

The definition of off-shoring needs to be clearly understood, providing an unambiguous way of distinguishing what the definition includes. The Panel's definition clearly states that off-shoring includes U.S. firms shifting service or manufacturing activities to either affiliated or unaffiliated firms located outside the United States in order to provide intermediate or final goods or services imports back to the United States, exports to foreign markets, or to directly supply the market in which the activity is occurring. The definition is not limited by import substitution or relocation conditions, and therefore includes job opportunities lost due to forgone exports and imports from either the expansion of U.S. foreign affiliates or expanded unaffiliated contracts.

2) Clearly Differentiable

According to the Panel's second criterion, the definition of off-shoring needs to be clearly differentiable from its economic impacts, and distinguish those off-shoring economic effects from other sources of change. If the employment effects covered in the off-shoring definition are not easily distinguishable from employment changes caused by, for example, new technology, increased productivity, or trade liberalization, then the definition has limited use in identifying the employment effects attributable to off-shoring.

Distinguishing off-shoring activities from their economic effects is important because a firm's off-shoring decision may not necessarily reduce its employment levels or even the work activity within the firm. This can occur if the off-shored activities are intended to meet increased foreign

demand. It can also occur if a firm decides to change suppliers for an outsourced activity from a domestic supplier to a foreign supplier. The firm making the off-shoring decision does not experience any employment change, nor does its activity level change. What changes is the source of purchased inputs used in its current production process. The previous domestic supplier of the activity being off-shored incurs the direct economic effects of job losses and declines in activity.

The Panel's definition is not limited to U.S. imports or MNCs. For example, Hira's definition, adopted by Lieberman staff, includes only MNCs as entities participating in off-shoring and therefore excludes those U.S. firms without foreign affiliates that are contracting activities out to unaffiliated firms located outside the United States. This is an artificial distinction, differentiating between virtually identical economic effects, suggesting that economic effects from MNCs contracting out activities to unaffiliated firms located abroad differ substantively from economic effects generated by nonmultinational entities contracting out activities to unaffiliated firms located abroad.

3) Consistent Through Time

To the extent possible, the definition of off-shoring needs to be consistent through time, capturing different outcomes due to event changes over time. The Panel's definition avoids any narrow limitations that would make it obsolete or outdated in the future—such as limiting it to low-cost countries or to either affiliated or unaffiliated firms.

One problem with narrow definitions is that the restriction can change over time, creating ambiguity about the definition. For example, wages in some low-cost developing countries can rise over time, sufficiently reducing wage differentials, and in turn eliminating them from consideration for off-shoring. For those countries, the low-cost limitation makes this definition obsolete in the future.

The type of firm, either affiliated or unaffiliated, that has control of a good or service being supplied to a U.S. firm can also change over time. A U.S. firm can choose to contract an activity out to an unaffiliated firm located in another country for a given period of time, and then choose to open a foreign affiliate in order to directly replace its transactions with that unaffiliated firm. Although this particular change in the control of the firm does not affect domestic employment, an off-shoring definition that is limited to either affiliated or unaffiliated firms would attribute new off-shoring activity and employment effects to such a mere change of control. Thus, in such cases, definitions limited to either affiliated or unaffiliated firms are not consistent through time.

4) Policy Relevant

The definition of off-shoring should be policy relevant, measuring what is of interest and pertinent to U.S. policymakers. While employment effects are currently a critical concern, the definition should also be able to distinguish other policy-relevant effects of off-shoring, such as effects on the U.S. comparative advantage in knowledge-intensive goods and services.

The Panel's definition of off-shoring is not limited to a single event, but rather recognizes that the accumulation of impacts over time due to expansionary activity of U.S. firms abroad can cause significant domestic employment effects in the future. Thus, this broader definition acknowledges that future employment changes have policy relevance. Current job losses may be of more immediate concern, but future changes should not be excluded from consideration. Moreover, off-shoring decisions are not immutable, because firms can and do reverse their decisions when expected benefits from initial off-shoring decisions fail to accrue. A static, one-time event definition can exclude these types of future changes that have direct policy relevance.

The Panel acknowledges that its broader, dynamic definition may raise additional measurement and estimation issues. Eliminating some narrow distinctions currently used will reduce some of the complexity and associated measurement issues from current off-shoring definitions. However, off-shoring remains an abstract and complex concept that raises significant measurement and estimation challenges. The proposed additional research described in Chapter 5 of this report will help assess the adequacy of currently available data in meeting those challenges and whether additional data would improve estimates of off-shoring activity and its derived economic effects.

Table 3-1: Alternative Definitions of Off-Shoring

Limitations	Definition and Source
<p>Off-shoring limited to multinational corporations</p> <p>Off-shore outsourcing limited to unaffiliated firms in lower-cost, primarily developing nations</p>	<p>Off-shoring: “multinational corporations relocating work from their domestic sites to foreign locations”</p> <p>Off-shore outsourcing: “. . . the contracting out of certain business functions to an external supplier . . . in lower-cost areas, primarily in developing nations”</p> <p>Office of U.S. Senator Joseph I. Lieberman, <i>Off-Shore Outsourcing and America’s Competitive Edge: Losing Out in the High Technology R&D and Services Sectors</i>, May 2004, p. 7. Lieberman staff define these terms according to those found in Ron Hira’s 2004 paper, “Implications of Off-Shore Outsourcing,” submitted for the Globalization, Employment, and Economic Development Workshop, a Sloan Workshop Series in Industry Studies held in January 2004.</p>
<p>Off-shore outsourcing limited to unaffiliated trade</p>	<p>Off-Shore Outsourcing: “Mode 1” trade in service under the WTO’s General Agreement on Trade in Services—trade in unaffiliated services, with supplier and buyer located in different countries</p> <p>Jagdish Bhagwhati, Arvind Panagariya, and T.N. Srinivasan, “The Muddles Over Outsourcing,” <i>Journal of Economic Perspectives</i>, vol. 18, no. 4, Fall 2004, p. 96.</p>
<p>International outsourcing limited to unaffiliated trade</p> <p>International in-sourcing limited to foreign direct investment and affiliated trade</p>	<p>International outsourcing: “giving rise to unaffiliated trade in services”</p> <p>International in-sourcing: “giving rise to foreign direct investment and affiliated trade in services”</p> <p>The terms used to define off-shoring are “international in-sourcing,” “giving rise to foreign direct investment and affiliated trade in services”, and “international outsourcing”, “giving rise to unaffiliated trade in services”</p> <p>Organisation for Economic Co-operation and Development, <i>Potential Off-shoring of ICT-Intensive Using Occupations</i>, April 2005, p. 5.</p>

Table 3-1: Alternative Definitions of Off-Shoring

Limitations	Definition and Source
<p>Captive off-shoring limited to wholly owned U.S. foreign affiliates serving U.S. and foreign markets (excluding the market in which they are located)</p> <p>Off-shore outsourcing limited to unaffiliated firms located outside the U.S., serving U.S. and foreign markets (excluding the market in which they are located)</p>	<p>Captive off-shoring: resourced activities performed in wholly owned affiliated units located outside the United States, serving U.S. and foreign markets, excluding the market in which they are located</p> <p>Off-shore outsourcing: resourced activities performed by third-party suppliers located outside the United States, serving U.S. and foreign markets, excluding the market in which they are located</p> <p>MGI, <i>The Emerging Global Labor Market</i>, June 2005, pp. 14-16.</p>
<p>Off-shoring limited to imports</p>	<p>Off-shoring: “an organization’s purchases from abroad (imports) of services that it previously produced in-house or purchased from another domestic source”</p> <p>United States Government Accountability Office, <i>Current Government Data Provide Limited Insight into Off-Shoring of Services</i>, September 2004, p. 2.</p>
<p>Off-shore outsourcing limited to intermediate imports</p>	<p>Off-shore outsourcing: “using imported inputs, from both arms-length firms and affiliates in foreign countries”</p> <p>Ashok Deo Bardhan and Dwight Jaffee, “On Intra-Firm Trade and Multinationals: Foreign Outsourcing and Off-Shoring in Manufacturing,” Haas School of Business, University of California Berkeley, April 2004, p. 2.</p>
<p>Off-shoring limited to a single relocation event</p>	<p>Off-shoring: “the relocation of jobs and production to a foreign country. The relocated jobs and production could be at a foreign office of the same multinational company or at a separate company located abroad”</p> <p>C. Alan Garner, “Off-Shoring in the Service Sector: Economic Impact and Policy Issues,” <i>Economic Review</i>, Third Quarter, 2004, p. 6.</p>

Table 3-1: Alternative Definitions of Off-Shoring

Limitations	Definition and Source
<p>Off-shoring limited to a single relocation event combined with the movement of portions of a firm’s production chain</p>	<p>Off-shoring: the migration of portions of the production chain to foreign locations</p> <p>The Brookings Institution, Brookings Data Workshop: Services Off-Shoring: What Do the Data Tell Us?, Session 4: “Off-Shoring and the U.S. Labor Market,” Gene Grossman (presenter), June 2004.</p> <p>Off-shoring: “the relocation of a whole process, a piece of a process, a function, or a discrete piece of work outside the geographic boundaries of the United States. Work can be done in an off-shore location either within the boundaries of the company or outside the boundaries of the company”</p> <p>Department of Commerce, Technology Administration, <i>Assessment of the Extent and Implications of Workforce Globalization in Knowledge-Based Industries</i>, July 2004, p. 4.</p>
<p>Global sourcing limited to a single relocation event and U.S. imports</p>	<p>Global sourcing: transferring a particular activity that was previously performed in-house, to U.S. foreign affiliates and unaffiliated firms located outside the United States that produce goods or services for import to the United States</p> <p>Staff interview with Nariman Behraves, chief economist of Global Insight, on the Global Insight paper written for the Information Technology Association of America (ITAA), <i>The Comprehensive Impact of Off-Shore IT Software and Services Outsourcing on the U.S. Economy and the IT Industry</i>, May 4, 2005.</p>
<p>Worldwide sourcing limited to a single relocation event and U.S. imports</p>	<p>Worldwide sourcing: the process by which a company relocates production to another country outside the United States, excluding the investments and jobs U.S. firms place overseas in order to sell products or serve customers in foreign markets</p> <p>U.S. Chamber of Commerce, <i>Jobs, Trade, Sourcing, and the Future of the American Workforce</i>, April 2004, p. 10.</p>

CHAPTER 4

MEASURING THE IMPACTS OF SERVICES OFF-SHORING— ESTIMATES, METHODOLOGIES, AND DATA IMPLICATIONS

INTRODUCTION

Off-shoring of production and service activities from the United States to other countries, particularly those with lower-costs or other strategic advantages, not only poses a public-policy dilemma for Congress and the administration, but an analytical and research challenge. Critical research questions include the following:

- Which service and manufacturing industries and occupations are most affected by shifts in business activities and operations overseas?
- How significant are these shifts in business activities and operations?
- Why are they occurring and are they likely to change over time?
- What are the likely effects on U.S. output, U.S. employment, and the standard of living of U.S. workers affected by these changes?
- What are the characteristics of affected workers?
- What are the costs and benefits to society as a whole?
- What are the responses of government agencies, workers, firms, and institutions providing education and training?

In particular, policymakers and researchers are interested in structural changes to the economy that may be occurring, and whether the movement off-shore of business activity and operations in this decade is different from movements of manufacturing operations and related jobs during the 1980s and 1990s.

Off-shoring of services is a relatively new public-policy concern, and over the past few years there have been an increasing number of studies and reports attempting to measure its economic impact and employment effects. These studies vary widely in scope, data sources and quality, analytical methodology, timeframe, and findings. Some differences reflect the inherent difficulty in directly measuring or estimating the extent and effects of off-shoring, and limitations in currently available official data.⁴⁴

This chapter presents representative estimates of the number of service jobs at risk to be off-shored, projected to be lost, and off-shored already, and summarizes the principal methodologies

⁴⁴ See Appendix D, which describes official data from U.S. and key international statistical agencies.

used to estimate those effects. The chapter discusses significant studies that attempt to describe or estimate the number and types of industries, occupations, and jobs affected by off-shoring. It presents a broad overview of the methodologies used and suggests some implications for the statistical agencies. Appendix C provides a more complete bibliography of works reviewed for this report.

The Panel does not endorse any of the estimates presented below. This review is intended to inform the Congress and the public about the range of current estimates and to examine whether any consensus exists. Similarly, while this chapter also describes possible new data proposals suggested by these studies, the Panel believes that additional research is needed before it can recommend any changes. (Chapter 5 explains the additional research that needs to occur.) This review of existing sources and uses of data and analytical methodologies is a necessary first step for determining additional research needed to evaluate the importance and feasibility of potential new data directions.

ESTIMATES OF THE IMPACT OF OFF-SHORING ON JOBS

A number of recent studies and reports attempt to measure or estimate the extent of off-shoring and its economic effects, particularly its impact on U.S. jobs. The discussion and tables below summarize the major studies selected for review into three broad groups based on the nature of their employment impact estimates:

1. descriptions of the types of occupations and estimates of the number of jobs *potentially* at risk of being off-shored
2. forecasts of the number of jobs *likely* to be off-shored
3. estimates of the number of jobs *already* off-shored

The studies reviewed for this report vary widely in scope and methodology, time frame covered, data sources employed, definitions of off-shoring used, and types of jobs included in their estimates.

While estimates of the number and types of occupations and jobs that are either potentially or likely to be affected by off-shoring vary widely, the number of jobs impacted appears relatively small, when compared to total annual job losses in the United States. However, this aggregate comparison does not account for potentially significant distributional issues for particular occupations or areas affected, nor does it consider the severity of impacts on workers displaced by off-shoring. Many studies appear to agree on some of the key characteristics of service jobs that make them vulnerable to off-shoring, but these characteristics frequently rely on nonempirical judgments and distinctions difficult to verify or replicate independently.

A number of other off-shoring studies that do not provide specific employment impact estimates are discussed in the methodologies section on page 80.

Estimates of Occupations and the Number of Jobs *Potentially* At Risk of Being Off-Shored

Table 4-1 summarizes studies that have attempted to identify service jobs that may be at risk for off-shoring. The estimates cover the periods 2000 to 2003 and range from 9.4 percent to 18.1 percent of U.S. employment. Most studies acknowledge that these potential jobs at risk reflect upper bound estimates for likely job shifts. Actual job shifts within these bounds depend upon other requirements, such as the need for a physical presence, specialized knowledge of local culture, institutions, or markets, or nonroutine interactions with workers or customers.

Table 4-1: Estimates of Occupations Potentially at Risk of Being Off-Shored

Researcher	Characteristics of Jobs at Risk for Off-Shoring	Occupations at Risk for Off-shoring	Estimated Number of Jobs Potentially at Risk
Bardhan and Kroll, Kroll	<ol style="list-style-type: none"> 1. high information content 2. no face-to-face customer service requirement 3. work processed telephonically or electronically (Internet) 4. high wage differential with same similar occupations in host country 5. low set up barriers 6. low social networking requirement. 7. tasks reducible to a set of instructions with measurable output 	<ul style="list-style-type: none"> ▪ architectural and civil drafters ▪ business and financial support positions ▪ cartographers ▪ computer and math professionals ▪ graphic designers ▪ medical transcriptionists ▪ office support jobs ▪ paralegals and legal assistants ▪ radiologic technologists and technicians; ▪ technical writers 	15 million service jobs, or 11.7 percent of U.S. workforce in 2003
McKinsey Global Institute	<ol style="list-style-type: none"> 1. no physical presence requirement 2. little complex interaction with customers (no face to face) 3. little interaction with colleagues needed (low social networking) 4. little knowledge of local markets and customs needed 	<ul style="list-style-type: none"> ▪ accountants ▪ analysts ▪ engineers ▪ researchers ▪ support staff and generalists (defined as positions not requiring any specific training but requiring a college degree) 	160 million jobs worldwide, or 11 percent of the global workforce in 2003
Jensen and Kletzer	<p>“Tradable occupations” are occupations in industries that are geographically concentrated. These occupations can be broken down into discrete functions and moved offshore.</p>	<ul style="list-style-type: none"> ▪ computer and mathematical ▪ legal ▪ life, physical, and social sciences ▪ business and financial operations ▪ architecture and engineering 	9.4 million jobs, or about 9.43 percent of total employment across all industry sectors in 2000

Table 4-1: Estimates of Occupations Potentially at Risk of Being Off-Shored

Researcher	Characteristics of Jobs at Risk for Off-Shoring	Occupations at Risk for Off-shoring	Estimated Number of Jobs Potentially at Risk
Van Welsum	<ol style="list-style-type: none"> 1. intensive use of information and communications technologies 2. high informational content 3. no face-to-face contact required 	<ul style="list-style-type: none"> ▪ brokerage clerks ▪ computer operators ▪ computer programmers ▪ computer software engineers ▪ computer support specialists ▪ data entry keyers ▪ database administrators ▪ insurance claims and policy processing clerks ▪ network systems and data communications analysts ▪ network and computer systems administrators ▪ statistical assistants ▪ telemarketers ▪ telephone operators ▪ word processors and typists 	approximately 18.1 percent of total employment in 2002
Garner	<ol style="list-style-type: none"> 1. labor-intensive: labor makes up a large part of production costs 2. information-based: jobs collect, manipulate, or organize information 3. codifiable—job can be reduced to a routine set of instructions. 4. high-transparency: the information that is exchanged is easy to measure and verify 	<ul style="list-style-type: none"> ▪ billing clerks ▪ accounting clerks ▪ computer programmers ▪ customer service representatives ▪ radiologists ▪ technical writers ▪ telemarketers 	14 million service jobs, or 10 percent of total employment in 2000

While estimates range widely, there appears to be consensus about critical characteristics of those occupations sensitive to globalization. Bardhan and Kroll (2003) and Kroll (2005)⁴⁵ suggested seven attributes of occupations that put them at risk for off-shoring (see Table 1). In addition, determinants of which locations are chosen for off-shoring include an overall favorable cost differential, institutional and cultural compatibility, including English speaking, and a well-educated labor force.

Applying at-risk criteria to the BLS' Occupational Employment Statistics Survey, studies identified certain occupations to be at risk of off-shoring. These include computer operators and data-entry clerks, business and financial support, computer and math professionals, paralegals and legal assistants, and diagnostic support services and medical transcriptionists. Altogether some 56 occupations were identified, covering about 15 million U.S. workers, or 11.7 percent of the workforce.

MGI⁴⁶ estimated that 160 million jobs (or 11 percent of the global workforce) could potentially be “resourced” or off-shored worldwide by 2008. The authors calculate this “theoretical maximum” by breaking down various business processes into discrete functions across the eight sectors reviewed—including automotive, healthcare, insurance, IT services, retail, retail banking, packaged software, and pharmaceuticals—and determined the positions required to perform each function. The authors then estimated positions that could potentially be performed anywhere in the world.

Jensen and Kletzer⁴⁷ used a geographically based selection criterion to characterize occupations as either tradable or nontradable (off-shorable or not off-shorable). Tradable occupations are those in geographically concentrated industries, which are tradable domestically, and thus potentially sensitive to international trade. Occupations that are nontradable tend to be in industries that are relatively dispersed. The authors suggest that some service occupations are tradable even though they may be in industries not considered tradable. Occupational groups with the highest proportions of tradable employment are business and financial operations (68 percent), computer and mathematical occupations (100 percent), architecture and engineering (63 percent), legal (96 percent), and life, physical, and social sciences (83 percent).

Like Kroll and MGI, Van Welsum focused her analysis on occupations that could be potentially affected by off-shoring and outsourcing,⁴⁸ based on their reliance on information and communications technologies. For the United States, she found that these occupations accounted for 18.1 percent of total employment in 2002. Industries with over 30 percent of their workforce

⁴⁵ Ashok Deo Bardhan and Cynthia Kroll, *The New Wave of Outsourcing*, paper 1103 (Berkeley, California: Fisher Center for Real Estate and Urban Economics, University of California at Berkeley, 2003).
Cynthia A Kroll, *State and Metropolitan Area Impacts of the Offshore Outsourcing of Business Services and I.T.*, working paper 05-293 (Berkeley, California: Fisher Center for Real Estate and Urban Economics, University of California at Berkeley, 2005).

⁴⁶ MGI, *The Emerging Global Labor Market*.

⁴⁷ J. Bradford Jensen and Lori G. Kletzer, *Tradable Services: Understanding the Scope and Impact of Services Offshoring*, working paper 05-9 (Washington, D.C.: Institute for International Economics, 2005).
<http://www.iie.com/publications/wp/wp05-9.pdf>

⁴⁸ VanWelsum and Vickery, *Potential Off-Shoring*

in occupations identified as sensitive to the impact of off-shoring and outsourcing accounted for over 20 percent of total U.S. employment.

Garner⁴⁹ used the same methodology as Kroll to estimate that over 14 million service jobs were at risk for off-shoring as of 2000. The report suggested that although the data show that the off-shoring of services is small relative to the total U.S. job market, it will likely increase in the future. Lower foreign labor costs, liberalized markets, reduced telecommunication costs, and technological advances have allowed many service tasks to be performed abroad at lower costs, and will continue to do so. The report further suggested that off-shoring would displace some service workers in the short run, but would not permanently lower the nation's employment or production in the long run.

Forecasts of Number of Jobs *Likely* to be Off-Shored

Table 4-2 summarizes analyst forecasts of the numbers of jobs likely to be lost due to projected future off-shoring of business activities.

Goldman Sachs⁵⁰ used information gathered from interviews with industry experts to project that up to 6 million service jobs could be off-shored over the next decade. The study suggested that the pace and extent of off-shoring by U.S. businesses will depend on the magnitude of potential savings, logistical constraints, and labor-supply constraints of the off-shore destinations.

The MGI study, discussed above, took a global approach, rather than focusing only on U.S. jobs.⁵¹ It predicted that of the 160 million jobs worldwide that could potentially be off-shored by 2008, only about 4.1 million, or 1.2 percent of the global services workforce, will actually be relocated. The gap between the potential for jobs to be off-shored and the likely number to actually be off-shored is the “degree of adoption.” Some of the factors that determine it include cost pressures, competition for resources, size of the company, and the legal, regulatory, social, and political environment in the receiving country. The study concluded that labor markets in developed economies, including the United States, will continue to trend towards off-shoring for the foreseeable future.

⁴⁹ Garner, “Off-Shoring in the Service Sector.”

⁵⁰ Goldman Sachs Global Economic Research, *Offshoring: Where Have all the Jobs Gone?* (New York: Goldman Sachs Global Economic Research, September 19, 2003).

⁵¹ *Ibid.*

Table 4-2: Forecasts of Jobs Affected by Off-shoring

Researcher	Forecast Jobs Lost	Timeframe	U.S. Sector	Annual Average⁵²	Off-shoring Estimate Relative to Sector Annual Job Loss (Percent)⁵³
Direct Employment Effects					
Goldman Sachs	up to 6 million service jobs lost	2003-2013	all services and manufacturing	600,000	2%
McKinsey Global Institute	4.1 million service jobs projected to be off-shored worldwide; no separate forecast for U.S.	2005-2008	not applicable (forecast is for worldwide service sector)	1.36 million	not applicable
Forrester Research	3.4 million service jobs lost in nine occupational categories	2005-2015	all services	340,000	1%
Deloitte Research	850,000 jobs lost, mostly back office positions	2003-2008	financial services	170,000	9%
Direct and Indirect Effects					
Global Insight Inc.	272,000 IT software and services jobs are expected to go offshore of the 516,000 total jobs expected to be created	2004-2009	software and other IT services	54,400	8%

⁵² Annual averages are based on staff calculations using off-shoring estimates.

⁵³ The annual average was converted to a quarterly average and expressed as a proportion of quarterly job loss in the sector for each quarter of 2004. These quarterly percentages were then averaged. Source data come from the BED, Bureau of Labor Statistics.

A widely cited study on off-shoring by Forrester Research estimated that up to 3.4 million services jobs could move off-shore by 2015.⁵⁴ The study was based primarily on interviews and surveys of businesses, vendors, and IT professionals in the United States and India.

A study by Deloitte⁵⁵ forecast that up to 850,000 U.S. financial services jobs may be off-shored by 2008 (2 million worldwide). Using 2001 source data from the International Labor Organization, the authors assumed that the United States has the same percentage of its workforce employed in financial services as Germany (3.7 percent). They then derived an estimate of the total number of jobs likely to be off-shored based on an estimated 15 percent overall cost savings from off-shoring by the major financial services firms. Deloitte points out that market and industry pressures are creating an imperative for financial institutions to off-shore back-office processes as a way to remain competitive.

Global Insight, in its 2004 study for the Information Technology Association of America (ITAA),⁵⁶ predicted that the benefits of off-shoring will translate into the creation of roughly 516,000 IT software and services jobs in the United States, of which about 272,000 jobs will migrate to overseas locations. Global Insight used a model that simulates the potential impact of off-shoring on key economic and employment variables, including inflation (lower), interest rates (lower), real wages (higher), exports (higher), and GDP (higher). The study concludes that the overall benefits of off-shoring far outweigh any negative short-term effects on employment.

Estimates of Number of Jobs Off-Shored To Date

Table 4-3 summarizes the findings of a number of studies that have attempted to estimate the number of jobs actually lost as a result of off-shoring.

Bronfenbrenner and Luce⁵⁷ examined the impact of U.S.-China trade relations on workers, wages, and employment in the United States and analyzed current trends in production shifts from the United States and other countries. Using media reports, interviews with corporate executives, and a database with information on actual or announced production shifts out of the United States, the authors estimated that 255 actual or announced production shifts (representing a total of 48,000 jobs) to lower-wage countries occurred during the first quarter of 2004. The authors also found that production shifts were occurring increasingly to India, China, and Latin America. While most of the production shifts to China were in manufacturing, a majority of the shifts to India and other Asian countries were in communications and IT. The study concluded that there needs to be a government-mandated reporting system to track production shifts out of the United States.

⁵⁴ John C. McCarthy, *Near-Term Growth of Offshoring Accelerating* (Cambridge, Massachusetts: Forrester, May 2004).

⁵⁵ Deloitte Research, *The Cusp of a Revolution: How Offshoring Will Transform the Financial Services Industry* (Deloitte Research, 2003).

⁵⁶ Global Insight and ITAA, *Executive Summary: The Comprehensive Impact*.

⁵⁷ Kate Bronfenbrenner and Stephanie Luce, *The Changing Nature of Corporate Global Restructuring: The Impact of Production Shifts on Jobs in the US, China, and Around the Globe* (Washington, D.C.: U.S.-China Economic and Security Review Commission, October 2004).

Table 4-3: Estimates of Actual Jobs Affected by Off-Shoring

Researcher	Jobs Lost	Time Frame	U.S. Sector	Annual Average ⁵⁸	Off-shoring Estimate Relative to Sector Annual Job Loss (Percent) ⁵⁹
Direct Employment Effects					
Bronfenbrenner & Luce	48,000	January 1 to March 31, 2004	Manufacturing	192,000	8%
Brown	16,073	All four quarters for 2004	all private nonfarm industry sectors (services and manufacturing)	16,073	<1%
Garner	218,000	2000-2002	all service sectors	109,000	<1%
McKinsey Global Institute	565,000	As of 2005	not applicable (estimate is for worldwide service sector)	Not Applicable	N/A
Schulze	155,000 - 215,000	2000-2003	BPT services sector	52,000-72,000	1%
TechsUnite.org (WashTech and Communications Workers of America)	437,000	January 2000 to August 2005	all service sectors	77,000	<1%
Direct and Indirect Effects					
Baily and Lawrence	314,000	2000-2003	all manufacturing and services	104,000	3%
Global Insight Inc.	104,000	As of 2003	software and other IT services	N/A	n.a.

⁵⁸ Annual averages are based on staff calculations using off-shoring estimates.

⁵⁹ The annual average was converted to a quarterly average and expressed as a proportion of quarterly job loss in the sector for each quarter within the time frame (excluding quarters in 2005 for which data are not available). These quarterly percentages were then averaged. Quarterly job-loss statistics come from the BED, Bureau of Labor Statistics.

Sharon Brown's study described the Bureau of Labor Statistics' inclusion of questions about "movement of work" in its Mass Layoff Survey questionnaire. BLS defines movement of work as the overseas relocation of work from the United States to locations outside of the United States, either within the same company or to another company. The program identified 10,722 workers affected by overseas relocations between January and September 2004.

The Garner study estimated that of over 14 million service jobs at risk for off-shoring in 2000, some 218,000 service jobs were off-shored between 2000 and 2002.⁶⁰ The MGI 2005 study, discussed in more detail below, found that 565,000 service-sector jobs had been off-shored as of 2003 in the eight case-study industries analyzed. MGI expects the number to double by 2008 for the same eight sectors.

Charles Schultze, in a policy brief for the Brookings Institution, estimated that increased service imports between 2000 and 2003 implied an aggregate job loss of between 155,000 and 215,000 just in the BPT sector alone. He cautioned, however, that it's unclear whether these job losses were due to off-shoring or other factors.⁶¹

According to www.techsunite.org, a website created by WashTech/CWA, a total of 437,000 jobs were off-shored between January 2000 and August 2005. WashTech is the union for high-tech workers, and www.techsunite.org tracks the names of the companies and the number and type of jobs moved overseas through media reports and information collected from workers. This "off-shore tracker" records in real time the destinations of U.S. jobs moved off-shore and the U.S. states that are most affected.

Baily and Lawrence⁶² estimated that close to 275,000 software and business processing jobs moved to India during the period 2000/01 and 2003/04. However, the study concluded that the impact of service sector off-shoring to India was very small when compared to the aggregate changes in service sector employment. In addition, most losses were in lower-level programming jobs.

The Global Insight report for the ITAA, cited above, applied a 40-percent cost-savings multiplier associated with off-shore outsourcing to estimate that 104,000 IT software and services jobs had been lost to off-shore locations as of 2003.

These studies suggest several observations. First, there is general agreement on many of the characteristics of service jobs that make them vulnerable to off-shoring, including high informational content of the work product, ability to use technology to deliver the product, and lack of a need for physical proximity to the client.

⁶⁰ Garner, "Off-Shoring in the Service Sector."

⁶¹ Charles L. Schultze, *Offshoring, Import Competition, and the Jobless Recovery*, policy brief 136 (Washington, D.C.: The Brookings Institution, August 2004).

⁶² Martin Neil Baily and Robert Z. Lawrence, "What Happened to the Great U.S. Job Machine?," *Brookings Papers on Economics Activity*, No. 2 (Washington, D.C.: The Brookings Institution, 2004).

Second, when compared to total annual job losses in the United States, current estimates of actual job losses appear relatively small.⁶³ For example, on an annual average basis, estimated job losses from off-shoring to date range from a high of 192,000 (Bronfenbrenner & Luce) to a low of 14,000 (BLS). However, this aggregate analysis may mask potentially significant distributional effects on particular occupations and workers. As a previous chapter pointed out, it is important to identify these potential impacts on specific jobs, as well as displaced workers in order to better assess the significance of off-shoring.

Third, even calculated on an annual average basis, forecasts for job losses from off-shoring vary widely—from a high of 600,000 (Goldman Sachs) to a low of 54,000 (Global Insight). It is hard to bridge the differences because methodologies differ and in most instances are proprietary.

The next section provides a broad discussion of the methods and approaches used by analysts attempting to understand the impacts and the implications of off-shoring of services.

METHODOLOGIES

This section focuses on methodologies underlying the estimates used to answer critical questions about off-shoring of services. It emphasizes studies that make use of existing data, and identifies any of their suggestions about whether and how existing surveys might be modified to capture additional data and what new data might be useful. However, as noted above, the Panel is not making any data recommendations at this time, because none of the studies have linked existing data sets effectively to fully test the usefulness of current data in estimating off-shoring effects.

Methodologies discussed below include theoretical models; syntheses of interviews with experts, key decision makers, and stakeholders; direct estimates by statistical agencies; estimates by private research and consulting companies; web and media searches; and model estimation, forecasts, and simulation, which include a broad range of methodologies, from simple regression to complex multi-equation models (see Table 4-4).

Theoretical Models

These analyses employ mathematical, graphical, and logical methods at the heart of international trade theory since the eighteenth century. Models of off-shoring generally are variants of comparative advantage and factor-price equalization theories. Models almost always assume full employment, and as a result focus on shifts in factor allocations and prices. For discussions of services off-shoring, theorists modify models to account for companies outsourcing part of their production process, even where firms or establishments remain in place. Examples of theoretically reasoned articles focusing on shifts in the terms of trade include Bhagwati, Panagariya, Srinivasan,⁶⁴ and Samuelson.⁶⁵

⁶³ According to BLS' Current Employment Statistics database, total nonfarm employment declined by approximately 0.6 million, or 0.46 percent, on an average annual basis between 2000 and 2003. Bronfenbrenner & Luce's worst-case projection of 192,000 would represent 32 percent of jobs losses averaged annually.

⁶⁴ Bhagwati, Panagariya, and Srinivasan, "The Muddles over Outsourcing."

The Gomory and Baumol⁶⁶ alternative to the traditional theory assumed that productivity can vary across firms or that there are increasing returns to scale from mass production. In these instances, Gomory and Baumol demonstrated that a country's income will be maximized if it successfully prevents migration of industries to its trading partner, except where the trading partner currently accounts for a very small portion of world income.

Overviews

These analyses present a view of the off-shoring process and its impacts based on conversations, official and other data, interviews, books, and articles. They frequently use authoritative sources to explore ideas and identify concerns and hypotheses, but may not have a clearly defined analytical structure. Quite often they marshal data and arguments in support of a particular point of view. Examples include the recent best-seller, “*The World Is Flat: A Brief History of the Twenty-First Century*” by *New York Times* columnist Thomas L. Friedman, Ron and Anil Hira’s *Outsourcing America: What's Behind Our National Crisis and How We Can Reclaim American Jobs*, Lou Dobbs’ *Exporting America: Why Corporate Greed is Shipping American Jobs Overseas*,⁶⁷ and Ashutosh Sheshabalaya’s *Rising Elephant: The Growing Clash with India Over White-Collar Jobs and its Meaning for America and the World*.⁶⁸

⁶⁵ Paul A. Samuelson, “Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization,” *The Journal of Economic Perspectives*, vol. 18, no. 3 (Summer 2004): 135-146.

⁶⁶ Ralph E. Gomory and William J. Baumol, *Global Trade and Conflicting National Interests* (Boston: MIT Press, 2000).

⁶⁷ Lou Dobbs, *Exporting America: Why Corporate Greed is Shipping American Jobs Overseas* (New York: Warner Books, 2004).

⁶⁸ Ashutosh Sheshabalaya, *Rising Elephant: The Growing Clash with India Over White-Collar Jobs and its Meaning for America and the World* (Monroe, Maine: Common Courage Press, 2005).

Table 4-4: Summary of Methodologies Reviewed

Methodology	Purpose	Key Features	Examples	Assessment
Theoretical Models	Conclusions for off-shoring based on the theoretical framework of international trade.	Usually based on theories of comparative advantage and factor-price equalization. Terms of trade, and assumptions of decreasing returns to scale, and constant productivity will affect conclusions.	Bhagwati, et. al. Samuelson Gomory and Baumol	Gains from trade may be offset by shifts in the terms of trade. Even where there are income and welfare gains, they may be unequally distributed and losers may not be compensated.
Overviews	Provide insight on new concerns, usually documenting a point of view.	Rely on interviews, personal observation, and available data.	Friedman Hira and Hira Sheshabalaya Dobbs	May interview key individuals, highlight key concerns and ideas, use or rely on anecdotes and media reports. Results may not be replicable or measurable.
Case Studies	Focus on a group of general interest; concern with past activity and broader implications.	Examines one or more subjects in depth. May have industry, national community, occupation, or other focus.	MGI U.S. Department of Commerce, Technology Administration	May provide good quantitative and qualitative analysis; may identify key drivers, factors of interest, hypotheses, data needs. Not readily generalizable.
Direct Measurements	Official statistics on the extent and impact of off-shoring.	Periodic data with known properties describing groups, activities, and concepts of concern (e.g., earnings, employment)	Trade statistics Multinational Company data Input-Output analysis Mass Layoff Statistics (MLS) Survey Occupational Employment surveys	Data collected by highly trained researchers; Open methodology; Data directly measure only part of off-shoring losses.

Table 4-4: Summary of Methodologies Reviewed

Methodology	Purpose	Key Features	Examples	Assessment
			Business Employment Dynamics Worker Displacement surveys	
Web and Media Searches	Use Internet to search for reports of factory closures and jobs moving overseas.	Sophisticated queries of data bases. User/member contributions of reports and information	Bronfenbrenner and Luce Communications Workers of America (Wash Tech)	Timely; Can quantify issues of concern before statistical agencies. Can identify smaller events that surveys miss. Reports tend to reflect the views of those concerned, may not be balanced.
Private Research Surveys and Estimates	Identify industry trends, new business models.	Field interviews with client list, important companies, government officials, others.	MGI Forrester Research Gartner Group Deloitte Research	Usually aware of developments early on from talking with customers, industry groups, others. Goal is to inform actual and potential customers. Less emphasis on statistical validity, repeatability.

Table 4-4: Summary of Methodologies Reviewed

Methodology	Purpose	Key Features	Examples	Assessment
Analytic Studies and Model Estimation	Used to test hypotheses suggested by theory.	Charts, tables, regression analysis; simulation with large scale macroeconomic models; input-output analysis.	Mann Kierkegard Bardhan and Kroll Kroll Hanson, Mataloni and Slaughter Van Welsum Baily and Lawrence Global Insight Kletzer Scott	Use existing data to identify trends and analyze problems. Statistically measure relationships among key variables, to test hypotheses suggested by theory. Try to put numbers on the extent of the problem. Studies show ingenuity in using existing data, point to other data that may be needed to address key questions on off-shoring of services.
Microdata and Longitudinal Analysis	Provide information about how households, business adjust to events over time.	BLS data available on Website, Census data in secure, limited-access data sets.	Jensen and Kletzer	Measures relationships over time; highlights trends. No data sets specifically identify off-shoring phenomena. No studies that link microdata from one survey to others within a statistical agency or between agencies.

Of the books cited, only Hira and Hira expressed concern about data needs for measuring and assessing the problem. “Data should be collected from existing and new surveys, and it should then be disseminated widely. We need, at a minimum, the data on:

- the numbers and types (by occupation, skill level, and wages) of jobs that are moving offshore
- the reemployment prospects and success (level of new wages and type of new job) for American workers displaced by outsourcing
- the numbers and types of jobs being created overseas by U.S.-owned companies for the purpose of exporting to U.S. markets compared to those created to service foreign markets
- the numbers and types of jobs being created in the United States by foreign-owned companies for the purpose of selling in the U.S. market compared to those created to produce exports for overseas markets
- companies’ near-term and long-range plans for relocating facilities and transferring jobs to overseas locations
- the impact of offshore outsourcing on academic and career choices made by American students
- the role of the H-1B and L-1 temporary visa programs in offshore outsourcing operations by U.S. and foreign-owned companies”⁶⁹

Case Studies

Case studies provide detailed analyses of individual sectors or industries. In narrowing the scope of analysis, researchers looked at conditions and circumstances driving off-shoring in a particular industry and its impacts on firms and workers. Strengths of case studies are that they allow analysts to focus on individual circumstances driving decisions and frame hypotheses and theories that can be tested in a broader context. However, if those circumstances are unique to the industry they may not be readily generalizable.

MGI’s 2005 study, *The Emerging Global Labor Market*, looked at eight industry groups—auto, health care, insurance, IT services, retail banking, packaged software, and pharmaceuticals⁷⁰—and nine service occupations—engineers, finance and accounting professionals, analysts, life science researchers, generalists, doctors, nurses, high-level managers, and support staff. The first

⁶⁹ Ron Hira and Anil Hira, *Outsourcing America: What’s Behind Our National Crisis and How We Can Reclaim American Jobs* (New York: American Management Association, 2005), 177.

⁷⁰ Industry groups were determined based on the similarity of their occupational distributions, based on BLS Occupational Employment Statistics. The sectors were then selected from within each industry group, based on their contribution to employment and GDP, McKinsey specialized knowledge, and the perceived potential for global resourcing. *Ibid*, Technical Notes, p. 4.

five occupations were further broken down into the categories of young professional, experienced professional, and middle manager. The analysis spanned 28 low-wage and 8 higher-wage countries. Table 4-1 contains the summary findings of this study.

The study gave as a reason for its undertaking “the absence of data on its [off-shoring’s] effects on the individuals, companies, and countries that provide off-shored service labor.”⁷¹ The report’s approach has a number of implications for the collection of official data. While it made heavy use of BLS data, it relied primarily on the Occupational Employment Statistics Survey to define occupations. The report subsequently used occupational distributions to identify structurally similar industry groups, from which case study sectors were selected. Case studies themselves were then projected to worldwide estimates for the supply and demand of those occupations.

MGI assumed that a principal difference between off-shoring of services and decades-earlier off-shoring of manufacturing is that manufacturing was industry-led, while services off-shoring is largely determined by functional or subfunctional organizational structure best approximated with occupation data. Thus, business-process reengineering may result in the outsourcing of selected components of the value chain. Services outsourcing may be less visible than previous manufacturing changes, since businesses are less likely to close down and move entire plants, but rather relocate selected jobs or functions. The report also suggested that it may be necessary to supplement traditional data used to track international trade and investment, which were product and industry oriented, with occupation-, employment-, skills-, and wage-based data as they apply to outsourcing and off-shoring.

TA conducted a six-month assessment of the extent and implications of workforce globalization in knowledge-based industries⁷² for the Appropriations Committee of the Congress in 2004. TA focused on three sectors—IT services and software, semiconductors, and pharmaceuticals. Like the MGI report, it found that companies in knowledge-based industries are breaking down their business processes such as research, production, and marketing into smaller discrete functions that can then be off-shored more readily.

TA staff used available BEA and BLS data, as well as information from Securities and Exchange Commission (SEC) filings and National Science Foundation data on science and technology indicators to develop estimates of off-shoring activities. The staff found that supplementary data were needed from major industry firms due to the following limitations of official data: the lag in the availability of benchmark Census industry numbers; the inconsistency of data from SEC filings, particularly data on employment by country for each company; and the lack of detailed BEA data on employment in unaffiliated international suppliers of U.S.-based MNCs, comparable to its employment data for affiliates. TA staff also noted that an occupational approach might be more appropriate than the traditional industry/product approach, and indicated that industry studies ultimately require official and unofficial data, including company interviews.

⁷¹ MGI, *The Emerging Global Labor Market*, 17.

⁷² Knowledge-based industries are characterized by an emphasis on creating value from ideas and concepts rather than material inputs and demanding labor.

Direct Measurement

Federal statistical agencies have long measured flows of business operations and jobs, using data from international trade statistics, MNC structure and operations, and employment, unemployment, and worker displacement surveys, Mass Layoff Statistics (MLS) Survey, and occupational surveys.

Although by most measures, services account for the vast majority of economic activity in the United States,⁷³ federal agency balance of payments and industry statistics continue to emphasize nonservice items, such as manufactured goods, agricultural products, and raw materials. These commodities continue to dominate international trade and are far easier to measure. The importance of services has been recognized in the North American Industry Classification System (NAICS) and its periodic revisions, but the measurement of services continues to provide special challenges.

The impact of off-shoring services is difficult to measure, especially when the effects are localized and small in overall magnitude. Descriptive national statistics also may not have an inherent early warning capability, which would be especially useful for policy officials.

Department of Commerce's Bureau of Economic Analysis⁷⁴

The following data sources produced by BEA can be used to measure the impact of off-shoring:

- imports and exports of services from and to affiliated and unaffiliated parties
- MNC operations overseas and in the United States, including data on production, employment, and financing
- MNC direct foreign investment overseas and in the United States
- industry statistics, including input-output tables

Any increase in off-shoring to access cheaper goods or services should be associated with an increase in services imports in the balance of trade statistics. In addition to the trade statistics, BEA collects data on MNCs at the enterprise or company level in benchmark and annual surveys,⁷⁵ classified using the NAICS.

⁷³ For example, Catherine L. Mann, "Offshore Outsourcing and the Globalization of U.S. 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, 2005): 287-288.

⁷⁴ Much of the description in this section is adapted from Obie G. Whichard, "Measuring Globalization: The Experience of the United States of America", prepared for the 22nd European Advisory Committee on Statistical Information in the Economic and Social Spheres (CEIES) Seminar, Statistics and Economic Globalization, Copenhagen, Denmark, June 2-3, 2003; and U.S. Bureau of Economic Analysis News: "*U.S. International Trade in Goods and Services, February 2005*", April 12, 2005.

⁷⁵ BEA staff believes that their surveys account adequately for the value of imported services reported by firms included in their sample regardless of the mode of service delivery. Thus, BEA surveys identify the value of services imported electronically as well as by other delivery methods. However, there may be sampling issues given

BEA data on imports and exports of services between affiliated parties cover transactions between U.S. MNCs and their affiliates and between foreign affiliates in the U.S. and their foreign parent groups. These surveys also provide information about operations, employment, and financing of U.S. and foreign parents and their affiliates. It may be feasible to match these BEA's affiliated trade data on services imports with the data on MNC operations to develop some initial indicators of off-shoring activity within MNCs. The apparent inability to cross-classify types of affiliated services imports by country of origin may restrict more detailed assessments of the reasons for off-shoring.

BEA survey data on imports and exports among unaffiliated parties does information on types of services imports by country of origin. However, BEA collects little data on operations of importing companies that are not MNCs. As a result, these BEA data on services imports are less likely to identify the extent of off-shoring activity for unaffiliated importers.

BEA staff have analyzed trade, foreign investment, and MNC data to assess the extent of off-shoring activities. BEA sees globalization as closely linked to the behavior of MNCs, which the agency has tracked through its own surveys since as far back as 1953.⁷⁶ A study by Landefeld and Kozlow found evidence that on average, MNCs invest abroad for access to foreign markets, rather than to take advantage of low wages; that in 2000, employment of U.S. MNCs remained concentrated in the United States; and that wage rates in the investor's home country were not significantly affected by wage rates in foreign host countries.⁷⁷

More recently, Kozlow and Borga analyzed services imports and found that while the importance of services imports has been growing, at the current time even large, errors in these growth estimates have a small impact on the overall GDP estimates.⁷⁸

In 2005, Ray Mataloni noted that between 1989 and 1999 foreign employment by U.S. MNCs grew faster than their U.S. employment, and that the difference in growth rates was especially large for computer and data processing services, accounting and auditing services, and research and development and testing services. While U.S. MNCs pay lower wages to overseas workers, production remains centered in high-wage countries. Moreover, several low-wage countries have large and rapidly growing markets and most sales of foreign affiliates are to local markets or other foreign countries.⁷⁹

changes in numbers of firms and the impact of technological change on access to international trade. This is reviewed in greater detail in a separate appendix.

⁷⁶ Ralph H. Kozlow, "An Overview of Economic Analysis Statistics on Multinational Companies." Prepared for the OECD Workshop on International Investment Statistics, Paris, March 22-24, 2004.

⁷⁷ J. Steven Landefeld and Ralph Kozlow. "Globalization and Multinational Companies: What Are the Questions and How Well are We Doing in Answering Them." Geneva: Conference of European Statisticians Globalization Seminar, 2003.

⁷⁸ Ralph H. Kozlow and Maria Borga, "'Offshoring' and the U.S. Balance of Payments." Power Point presentation prepared for the BEA Advisory Committee, November 5, 2004.

⁷⁹ Mataloni, Ray, "Offshore Outsourcing and Multinational Companies." Power Point presentation prepared for the International Tax Policy Forum, February 23, 2005.

Department of Labor's Bureau of Labor Statistics⁸⁰

The following data sources produced by BLS can be used to measure the impact of off-shoring:

- MLS Survey
- Worker Displacement Survey
- Occupational Employment Statistics Survey
- BED
- Labor-Force Projections

BLS data are particularly well-suited to identifying and describing the difficulties displaced workers encounter when they are transitioning to new jobs due to the off-shoring of services. BLS' MLS Survey attempts to measure directly the number of employees displaced in a mass layoff event for any reason, including the movement of jobs overseas. A monthly survey tracks summary information on all establishments having at least 50 initial claims for unemployment insurance (UI) filed against them during a five-week period. Data are available for 50 states, the District of Columbia, and Puerto Rico, as well as by industry.

A quarterly survey reports on private-sector nonfarm establishments that have had at least 50 initial claims filed against them during a five-week period and at which the employer indicates that 50 or more people were separated from their jobs for at least 31 days. Interviewers follow up with telephone surveys to employers to obtain information on the total number of persons separated, reasons for the separations, worksite closures, and recall expectations. Two specific questions are asked during this follow-up interview to ascertain whether layoffs occurred because of plants moving to new locations off-shore.

As part of the MLS Survey, analysts review UI data to determine the duration of unemployment and available socioeconomic characteristics on UI claimants. Duration is tracked through the monitoring of certifications for unemployment (continued claims) filed under the regular state UI program. Socioeconomic characteristics—gender, age, race, and residency—are collected when an initial claim is filed and again when and if the claimant exhausts regular UI benefits.

Data from this survey are available for 50 states, the District of Columbia, and Puerto Rico, as well as by industry. Data are based on the Quarterly Census of Employment and Wages (QCEW), or ES-202, program. Data include all establishments subject to state UI laws and federal agencies subject to the Unemployment Compensation for Federal Employees program, and cover some 98 percent of all employment. Because of the thresholds, the MLS Survey only accounts for a portion of jobs lost during the year.

⁸⁰ Much of this discussion is adapted from BLS website descriptions of the separate statistical programs.

The Worker Displacement Survey is collected every two years as a supplement to the monthly Current Population Survey. It focuses on workers displaced from jobs they had held for three or more years prior to displacement because their plant or company closed or moved, there was insufficient work for them, or because their position or shift was abolished. The survey asks about earnings, industry, occupation, and the existence of health benefits at the time of displacement, how long they went without work, whether they received unemployment benefits, and if so, whether the benefits were exhausted, whether the respondent moved to another location, and if currently employed, current earnings and health insurance. While it does not deal with off-shore outsourcing, the survey identifies workers likely to be harmed by its occurrence. Surveys cover the civilian noninstitutional population 16 years and older for the period 1979 to the present.

Kletzer uses the Worker Displacement Survey in *Job Loss from Imports: Measuring the Costs*,⁸¹ which examined the impact on workers of trade-related job loss compared with job loss in manufacturing or other sectors of the economy. In a subsequent study, Kletzer used data from the same survey to describe the characteristics of service-sector workers who are in occupations and industries at risk of off-shoring.⁸²

The Occupational Employment Statistics program conducts a semi-annual mail survey that collects data on wage and salary workers in nonfarm establishments in order to produce employment and wage estimates for over 700 occupations by geographic area and by industry. The program surveys approximately 200,000 establishments every six months, taking three years to fully collect the sample of 1.2 million establishments. These occupational data can be used to identify at-risk populations, and potential losses from specific off-shore outsourcing trends. It also allows researchers to identify service occupations in nonservice industries that could be affected.

The OES data can be used with the BEA's input-output tables to identify workers and occupations in industries most likely to be affected by changes in imports, as is likely to occur with off-shoring of services. In fact, the BLS staff who produce the occupational projections maintain their own input-output tables that are adjusted to give detail by occupation and employment by industry.

The Business Employment Dynamics database includes a quarterly series of gross job gains and gross job losses statistics for the entire economy, broken down into 3 goods-producing and 10 services categories. The database tracks changes in employment at the establishment level, showing the gross job creation and destruction that underlie the net employment statistics. Data show differential patterns of job creation and loss at different points in the business cycle and for different major sectors of the economy. Underlying data used to construct the gross job gains and gross job losses statistics are also from the QCEW program. However, data do not identify sources or reasons for gross job losses or job gains reported.

To the extent that services off-shoring is occupation rather than industry driven, BLS data, particularly from the Occupational Employment Statistics Survey, are especially useful. MLS

⁸¹ Kletzer, *Job Loss from Imports*.

⁸² Jensen and Kletzer, "Tradable Services."

Survey data are potentially informative, but limited by establishment and industry classifications of the state unemployment data and thresholds for establishment size and number of claims filed during a 31-day period.⁸³ The Worker Displacement Survey, in contrast, is an occupation-related data series that may provide greater detail about workers affected by off-shoring. Its principal limitation is that because it is household based, there does not appear to be a good way of identifying the cause of the displacement—for example, was it the result of domestic outsourcing or off-shoring.

Web and Media Search

Media reports typically identify trends before they show up in national statistics. They report events of interest or concern, and if they identify real and persistent problems, they can focus public awareness. Given media attention to events such as plant closures or major outsourcings, some analysts have attempted to track job losses by searching the Web for media reports.

A good example of this methodology is Bronfenbrenner and Luce, *The Changing Nature of Corporate Global Restructuring: The Impact of Production Shifts on Jobs in the US, China, and Around the Globe*, for the U.S.-China Economic and Security Review Commission in 2004. Also, the Washtech website of the Communications Workers of America summarizes off-shoring events and companies, focusing on high-tech workers primarily in communications and IT sectors.

Private Research Surveys and Estimates

In the absence of detailed official numbers, private consulting firms estimated the extent of off-shore outsourcing and its impact on particular sectors and occupations. These firms include Forrester Research, MGI, Deloitte Research, the Gartner Group, Goldman Sachs, Price Waterhouse Coopers, and others. The previous section discussed a number of their analyses and tables highlighted the variation in timeframes and coverage of these studies and the range of estimated job losses from off-shoring.

While private research surveys and estimates are reasonable sources of information, they are limited in their usefulness. Because much of their methodology is proprietary, there is no basis for assessing the precision of their forecasts, assuring that they are representative, or knowing that other researchers using similar methodologies could replicate findings. Greater transparency of the methodology, assumptions, and survey results used to develop these estimates would substantially enhance their usefulness for identifying data needs and improving development of official data.

⁸³ Another potential limitation with the MLS data is that some respondents may not recognize that off-shoring is the cause of their contract termination. This can occur to domestic suppliers whose contracts are ended when their purchasers decide to shift to an overseas supplier. In this case the purchaser makes the off-shoring decision, but the employment and production impacts affect the domestic supplier who may be reporting a termination of a contract as the reasons for a lay-off event.

Model Estimation and Inferences

Economists and other analysts use a variety of methods and data to understand the implications of the off-shoring phenomenon. Recent studies have used the following research methodologies:

- technical analyses that build on published government statistics and other research
- regression and related single-equation econometric techniques
- large macro modeling with adjustments to individual equations to simulate the various economic impacts
- interindustry models including input-output models or models that incorporate large macro-modeling capability to provide dynamic estimates of off-shoring effects
- analysis of federal agencies' statistical microdata to identify at-risk industries, firms, and occupations and assess adjustment costs of displaced workers

Technical Analyses

Some studies rely primarily on published statistical data from federal agencies, industry data, and findings of other studies to analyze trends in and impacts of off-shoring of services on the labor force and the economy. For example, Catherine Mann has written about the impact of globalization on the economy, especially on the IT sector and on non-IT industries heavily dependent on IT. Mann used a broad range of published federal statistics, as well as private-industry data and econometric evidence from other studies, to assess the impact in the United States from the globalization of services.⁸⁴

The main thrust of Mann's argument is that IT and IT-enabled businesses are likely to benefit from lower prices of imported intermediate goods, because (1) with price-elastic and income-elastic demand, they will use proportionately more of those services, and (2) increased use of the services will make them more productive, with positive impacts on employment and the economy, although the job mix is likely to change.

Mann strongly emphasized the need for additional data on relative prices of services traded internationally. She publicly encouraged statistical agencies to provide this type of information to researchers.⁸⁵ While the Bureau of Labor Statistics has well-developed data on international prices of imports and exports covering "nearly 100 percent of U.S. commodity imports and exports, by value," it only covers prices of services for the "air freight, air passenger fares, crude oil tanker freight, and ocean liner freight" industries.⁸⁶

⁸⁴ Ibid.

⁸⁵ Catherine L. Mann, *Prices for International Services Transactions* (Washington, D.C.: U.S. Bureau of Labor Statistics, September 2004).

⁸⁶ See BLS Import/Export Price Indices website, www.bls.gov/mxp/ippovrvw.htm#item1

Jacob Kirkegaard has critically examined a number of private projections of the numbers and types of jobs at risk to off-shoring. Relying primarily on BLS data—the Occupational Employment Statistics, Current Employment Statistics, Current Population Survey, and Business Employment Dynamics—he concluded that much of the observed employment loss was cyclical in nature, a disproportionate share was in the manufacturing sector, and most jobs lost were in management positions.⁸⁷

Bardhan and Kroll identified over 14 million jobs at risk to off-shoring, and in subsequent work, Kroll added an additional million jobs to the list.⁸⁸ See previous discussion in this chapter.

Econometric Analyses

Many studies use econometric analysis, including single or multiequation modeling. Regression analysis is one of the most commonly used statistical methods for describing relationships of variables over time or across categories such as industry, occupation, or geography. These analyses typically follow from the mathematical models describing economic phenomena, and provide useful estimates of the predicted impacts and validation of the theories. In the area of services off-shoring, regression analysis has been used to determine whether off-shoring activity is a complement of or a substitute for domestic activity, to estimate its efficiency gains, and to describe impacts on employment and characteristics of the affected workforce.

For example, Hanson, Mataloni, and Slaughter, *Expansion Abroad and the Domestic Operations of U.S. Multinational Firms*, found a small but positive impact of an expansion of foreign sales on domestic employment. They also found that low-wage foreign jobs substitute for low-wage U.S. jobs; but high-wage foreign jobs were complimentary to high-wage U.S. jobs.⁸⁹

Van Welsum (2004) estimated the relationship between off-shoring and U.S. imports of services using a pooled time series and cross-sectional regression analysis. The study found that relative prices have a significant effect on demand, and that U.S. imports appear to be more price sensitive than U.S. exports. It also found a positive relationship between offshore investment and subsequent increases in imported services. Inward investment, on the other hand was not positively correlated with subsequent outflows of services.⁹⁰

The Kletzer study, cited above, used logit regression and Worker Displacement Survey data to describe key factors affecting the re-employment prospects of workers laid off as a result of import competition. Over the sample period 1979-1999, for the 13,846 manufacturing workers in the sample the re-employment rate was 64.7 percent. “High-import workers...are a statistically significant 3.4 percentage points less likely to be reemployed than low-import workers. . . . Prime-aged workers (25-44 years old) have reemployment rates 11 percentage

⁸⁷ Jacob Kirkegaard, *Outsourcing: Stains on the White Collar?* (Washington, DC: Institute for International Economics, 2004).

⁸⁸ Bardhan and Kroll, *The New Wave of Outsourcing*. Kroll, *State and Metropolitan Area Impacts*.

⁸⁹ Gordon H. Hanson, Raymond J. Mataloni, Jr., and Matthew J. Slaughter, *Expansion Abroad and the Domestic Operations of U.S. Multinational Firms* (Washington, D.C.: National Bureau of Economic Research, September 2003).

⁹⁰ Desiree Van Welsum, *In Search of “Offshoring”: Evidence from U.S. Imports of Services* (London: Birbeck College, September 2004).

points higher than workers above the age of 45; workers with some college or a college degree experience higher reemployment rates of 14-27 percentage points; and minority workers are 11 percentage points less likely to be reemployed.⁹¹

Large-scale macroeconomic models may have hundreds of equations defining the overall operations of the economy in varying levels of detail. Typically, there are aggregate demand sectors describing household, business, and government expenditures; a balance of trade and foreign investment sector; and financial and monetary equations. These equations have been used to simulate the impacts of one or more policies by (1) identifying key variables, (2) obtaining baseline forecasts for those variables, (3) modifying selected individual equations to simulate the desired changes, and (4) comparing simulation-model forecasts for key variables to baseline forecasts over a period of time.

Martin N. Baily and Robert Z. Lawrence used a large-scale macroeconomic model, operated by Macroeconomic Advisors LLC, to simulate the economic impact of the Forrester forecast of some 3.3 million jobs off-shored by 2015. To do so they reduced the price of services imports iteratively until the quantity of imports rose to an extent to displace the 3.3 million workers. Allowing for behavioral responses to the change in prices and policy responses to the change in aggregate employment, the model projected offsetting increases in productivity and corporate profits, and an increase in real GDP of some \$384 billion by 2015, with employment and unemployment unchanged from baseline. Real compensation was increased by \$209 billion and real profits by \$142 billion.

Global Insight, another provider of large-scale econometric modeling services, in 2004 produced a study for the ITAA.⁹² It found similar results to the Baily and Lawrence study. After allowing for behavioral and policy responses, spending on off-shore IT resources would save some \$20.9 billion by 2008, and use of lower-cost intermediate inputs would lower inflation, increase productivity, and lower interest rates. Business and consumer spending would increase and stimulate economic activity, adding some \$124.4 billion to GDP by 2008. Although IT workers would be displaced, added growth would generate 317,000 new net jobs by 2008 compared to the baseline. Real wages would increase by 0.13 percent and the U.S. trade surplus in services would continue to be positive.

One particular form of large-scale modeling, inter-industry input-output analysis, may be useful for understanding some of the indirect effects of off-shore outsourcing. Off-shore outsourcing has ripple effects throughout the production chain. In addition to workers displaced by imported services, off-shoring will reduce value added and employment in firms that had been producing inputs for the off-shored service or product. If cost reductions from off-shoring are passed along in the form of reduced prices, this can benefit firms using the product or service by increasing their productivity, value added, and possibly employment as well. If the prices of the goods or services these firms provide can them be lowered, other firms in the production chain may be able to buy more, thereby increasing employment and economic activity.

⁹¹ Ibid., 49.

⁹² Global Insight and ITAA, *Executive Summary: The Comprehensive Impact*.

Input-output analysis can sort out these impacts. Input-output data identify what industries produce which products, and which products are used by industries in their production processes. This type of analysis also can be used to identify labor requirements for producing specific products and to give a more complete assessment of the total employment impact of changes in imports and exports.

Several analysts have used input-output analysis to quantify the impact of off-shore outsourcing on jobs. Scott looked at the trade deficit with China between 1989 and 2003 and tabulated its impact, by industry and state, on nonservice-sector job gains from exports.⁹³ He also tabulated job losses, by industry and state, from imports. He used detailed employment requirements by industry-sector matrix, which were developed by BLS based on the 1997 BEA Input-Output tables. Overall, Scott found that the growth in the trade deficits had resulted in the loss of some 1.5 million job opportunities between 1989 and 2003. He also found that a shift was occurring, with an increasing number of highly skilled technology jobs being lost.

Baily and Lawrence also used BLS-based input-output analysis to account for the indirect effects of trade, using an approach similar to Scott's.⁹⁴ By looking at the impacts of exports and imports separately, rather than at the net balance of trade, they drew a sharply different picture, concluding that most of the decline in employment was attributable to a failure of domestic demand to keep pace with the large increase in productivity of the sectors.⁹⁵

Kletzer used related interindustry data published by BEA to identify industries sensitive to the impacts of globalization.⁹⁶ This was the basis for identifying at-risk industries and occupations that were more closely examined using the displaced-worker data.

One major limitation of input-output analysis is that it is essentially descriptive of the interindustry mechanism and does not incorporate the behavioral responses of firms and industries to changes in prices, interest rates, and other external factors. Large macroeconomic models incorporating interindustry equations can help explain these underlying complexities. However, the Panel is not at this time aware of an analysis that has used such a model to study the impact of off-shoring.

Better data are more timely data. Benchmark input-output data typically lag three years from the year that the data are actually collected by the Census Bureau. During most of this time, the data are being processed by the Census Bureau. While earlier interindustry tables stressed goods at the expense of services, a shift in the NAICS has resulted in a much greater emphasis on the service sector, and it is not clear at this time whether more, or how much more, emphasis may be needed.

⁹³ Robert E. Scott, *U.S.-China Trade, 1989-2003: Impact on Jobs and Industries, National and State-by-State*, (Washington, D.C.: Economic Policy Institute, January 2005).

⁹⁴ Op. Cit.

⁹⁵ Ibid., 234.

⁹⁶ Kletzer, *Job Loss from Imports*, chapter 2.

Microdata and Longitudinal Analysis

The following types of raw data can be useful for measuring the impact of off-shoring:

- Census Public Use Microdata Sample (PUMS)
- Census Longitudinal Employer-Household Dynamics (LEHD) Database modeling linking workers and firms at the plant level over time.
- BLS National Longitudinal Surveys

While the modeling techniques discussed previously are designed to work with national statistics, the principal statistical agencies can make available raw data for use by researchers, under very strictly controlled conditions. Extreme care is taken to ensure that survey and census responses are confidential and that no respondent should be able to be identified through any use of the data. Only employees and approved researchers, sworn to protect the confidentiality of the data, are allowed to access the data.

One exception to this policy of restricted access is PUMS, which consist of Census records that have been made public on the Census Bureau website after they have been stripped of all identifiers and reviewed to ensure that identification of individuals through data examination is not possible.⁹⁷ These records contain very detailed demographic information about respondents, including geography, occupation, income, hours worked, and industry.

Jensen and Kletzer's study uses the 2000 Census PUMS to identify at-risk service industry firms and workers. The authors look at household/worker data to identify those occupations and industries that are geographically concentrated within metropolitan statistical areas, and therefore traded and potentially sensitive to off-shoring. This study is discussed previously in this chapter.

The Census Bureau also maintains longitudinal data sets that have been used for analysis of complex problems that involve both firms and their workers. The LEHD database combines microdata from business surveys and censuses with household surveys using state unemployment-insurance records. The database has been used to simultaneously analyze data from businesses and from the workers who work in those businesses. While the database has not been used to study off-shoring directly, data could be used to study such things as how firms respond to off-shoring pressures and the employment effects of that response, such as which workers are affected (displaced) and how quickly and completely they recover from being displaced.

The Census Bureau also maintains Statistics of U.S. Businesses for the Small Business Administration. Data files from this program can be used to track establishment births and deaths and employment expansions and contractions.

⁹⁷ These data are available at www.census.gov/main/www/cen2000.html for the 5 percent and 1 percent samples from the Census 2000 data and at www.census.gov/acs/www/Products/PUMS/ for the 5 percent and 1 percent samples from the American Community Survey data.

BLS also maintains a number of longitudinal files, including two longitudinal surveys of youth, a survey of young women and mature women, and a survey of young men and older men.⁹⁸ These data cover a broad range of work-related life experiences, such as education, aptitude, occupation, industry, income, child and family care, health, employment, unemployment, and retirement. While data appear to be detailed, they do not appear to have been used to identify workers displaced by off-shoring activities of firms or their characteristics and outcomes.

Researchers who use the Census Bureau's LEHD database suggest that a major advantage is its ability to link changes in the competitive condition of firms with characteristics of its employees. Because both firm and employee data are longitudinal, it is possible to identify changes over time. However, this data set is limited only to participating states, accounting for about 70 percent of the labor force, and its users require a high degree of research skills over and above those related to their discipline. In addition, security measures needed to prevent inadvertent disclosure of respondent identifiers severely limit access to data. It is not yet clear how these data may improve our knowledge about the impacts of off-shoring.

Implications of Methodologies for Data Needs

The discussion above introduces methodologies and data currently used in studying off-shoring, but the Panel is not ready at this time to identify specific data inadequacies that must be addressed. Despite the impressive body of work on the impacts and future of off-shoring, there remain large amounts of data that potentially could be used to address this issue. Following are some of the Panel's observations on the limitations of existing data and opportunities for expanding data collection, modeling, and research:

1. Theoretical discussions can be useful for clarifying definitions, hypotheses, and data needed to test hypotheses.
2. BEA, BLS, and Census collect data to address public-policy concerns and economic research needs, but except for the BLS' MLS Survey, none of the agencies is collecting data explicitly targeted at documenting the current and potential impacts from off-shoring of services. There appear to be opportunities for expanding the scope of official statistics to allow analysts to better understand the drivers and impacts of off-shoring.
3. Even with the best possible data, direct estimates will be limited in their usefulness. The complexity of off-shoring, behavioral responses to changes in prices, costs, and potential profitability, and the complexity of the interindustry structure make it impossible to measure directly the employment effects from off-shoring, especially for services. Direct measurement cannot identify workers and industries especially likely to be impacted by changes in the pattern of trade, including increased imports of specific types of intermediate goods and services. Direct measurement does not account for the responsiveness of firms and industries to changes in prices and wages worldwide, or to such factors as foreign government support, physical infrastructure, and regulatory and legal inducements and barriers to globalization.

⁹⁸ These can be found at www.bls.gov/nls/home.htm.

4. To estimate and forecast other important impacts, such as those on prices, economic growth, income distribution, technological change, and productivity, it will be necessary to use large macroeconomic models, preferably that have a strong interindustry component. These models lend themselves well to simulating the impact of particular factors, such as increased demand for the products of specific industries or changing technologies that result in lower prices of certain inputs.
5. When using modeling to estimate the impacts from off-shoring, it can be difficult to specify precise simulations and to interpret the results clearly and directly. Modeling results may be less persuasive than direct estimates, and they require more explanation of how they were obtained and what they mean. An implication for the statistical agencies is that they may have to meet the needs of analysts engaged in statistical estimation and model building, as well as provide better direct estimates. This may well imply that the statistical agencies need to identify and provide international comparisons on the relative prices of services and the wages and salaries of those working in the services industries worldwide.
6. Additional industry studies offer an opportunity to look in greater detail at the impacts of off-shoring on selected industries and occupations. These studies can facilitate a deeper understanding of these issues by utilizing detailed firm and industry data developed from additional data sources, including unique interviews with key individuals and organizations within the industry. They may suggest general trends or drivers, as well as potential new data that might be needed to verify them. However, by their nature industry studies are not replicable. Each is unique, and care must be taken in generalizing their findings to other industries, communities, or the nation.
7. Because displacement and how workers adjust to being displaced are key issues surrounding off-shoring, there may be a need for more frequent or detailed displaced-worker data that focuses on the service sectors. In addition, longitudinal data could be used to analyze the responses of individual workers and identify potentially cost-effective interventions. Equally important, both of these types of data may indicate which workers do not require assistance, since most job losses and individual job changes are part of normal economic activity and are unrelated to off-shoring as such.
8. Surveys are expensive and burdensome on respondents. Linking existing datasets, as the Census Bureau and the BLS do, may be a cost-effective way to extend the usefulness of existing data without additional burdens on correspondents. However, using administrative records for purposes for which they were never designed can be cumbersome and costly. It also may require interagency cooperation of an unprecedented nature. Nonetheless, it makes sense to look for new uses for existing data whenever possible.

CHAPTER 5

PROPOSED ADDITIONAL RESEARCH

In undertaking the off-shoring study, the Academy agreed with BEA that a comprehensive assessment of off-shoring would have to address five fundamental issues:

1. How should off-shoring be defined?
2. What do currently available data indicate about the extent of U.S. off-shoring?
3. What additional data are needed to provide a more complete assessment of U.S. off-shoring?
4. What factors account for current U.S. off-shoring?
5. What are the major impacts of off-shoring on U.S. workers, the economy, and the educational system?

The Panel addressed the first issue in Chapter 3 of this report by examining the range of definitions for off-shoring currently in use and recommending a broad definition that the Panel believes is clearly understood, differentiates the effects of off-shoring from other sources of economic change, is consistent through time, and is policy relevant.

To address the second and third issues, the Panel first reviewed the range of recent studies on off-shoring using currently available data to determine whether these studies provided a consistent set of estimates about the extent of U.S. off-shoring. This review also examined the analytical methodologies and types of data used in the studies to attempt to identify how potential data limitations affected estimates of the extent of off-shoring and its economic effects. Chapter 4 of this report describes the substantial differences among these previous studies in data used, periods covered, analytic methodologies employed, and estimates of employment and other effects from off-shoring. These differences were sufficient to preclude the Panel from forming any initial conclusions about either the extent of U.S. off-shoring or the need for additional data to assess more completely the extent and economic effects of U.S. off-shoring activities. This chapter reviews the need for additional research, defines the objectives of that research, identifies the critical components for each of the key issues to be addressed, and describes the proposed approaches for assessing those components.

NEED FOR ADDITIONAL RESEARCH

As already noted, the previous studies reviewed did not suggest a convergence for the range of estimates, a consensus on the need for additional data, or a preferred methodology for assessing the scale, scope, and impacts of off-shoring.

- Most studies used a different definition of off-shoring, usually narrower than the Panel's recommendation.
- Only a few studies attempted to estimate any off-shoring effects beyond direct employment impacts.
- None of the studies appeared to link independent data sets directly at a microlevel to estimate the extent, scope, and other characteristics of off-shoring.

Many of the studies that estimated the relocation of activities and associated employment shifts from the United States to India or other low-wage, developing nations used a narrower definition of off-shoring. U.S trade data indicate that the majority of U.S services trade (both imports and exports) occurs with higher-income, developed countries of Europe, Canada, Japan. If some of this trade meets the Panel's broader definition of off-shoring, then off-shoring estimates from studies that used a narrower definition may understate the extent of off-shoring activity.

Most of the studies reviewed in Chapter 4 estimate only the direct employment effects of off-shoring. The few⁹⁹ that included indirect employment effects using large macroeconomic models found that these indirect effects substantially reduced the estimated employment shifts from off-shoring. The Panel believes that these indirect employment effects as well as other economic effects such as efficiency gains and quality improvements must be included in any comprehensive assessment of off-shoring.

A number of these studies also identify limitations in currently available government data that impede a full assessment of off-shoring, but none of the studies have attempted to link industry and BEA trade data with BLS employment and wage data to use more completely the existing data. While this data linkage will undoubtedly be difficult, an assessment of the adequacy of current government data is incomplete if it does not fully consider all available data.

One of the reasons for the substantial differences among the current off-shoring studies is that several relied on proprietary data and methodologies that were not wholly transparent. The inability to replicate many of these analyses and their findings makes it difficult to evaluate them, adding to the need for additional research.

A final issue that emerges from the review of previous off-shoring studies is the potential significance of distributional consequences. While the aggregate number of direct job shifts from off-shoring may appear small relative to the total number of job losses and gains occurring in the U.S. economy, these aggregate comparisons may mask significant effects if the off-shoring is concentrated in certain industries, occupations or professions, or geographical areas. A disaggregated analysis of key sectors can help identify whether such distributional consequences are present.

⁹⁹ The major studies estimating indirect employment effects included Baily and Lawrence, and Global Insight.

INDUSTRY STUDY OBJECTIVES

The most recent off-shoring studies reviewed in chapter 4 have concentrated primarily on service industries (tables 4-2 and 4-3), particularly IT and communications functions within them and the highly skilled occupations providing those services. This focus reflects the current public concerns about the apparent spread of off-shoring to service industries, particularly to those involving high-technology or knowledge-based activities.

The additional research proposed by the Panel will maintain this service-industry focus, responding to these same concerns and recognizing the increased economic significance of services for the U.S. economy. Service industries are the predominant component in the U.S. economy, accounting for over 79 percent of GDP and over 82 percent of total employment in 2004. Services employment has grown more rapidly than total employment growth over the last decade, and this has accelerated since 2000. Most previous analyses of labor adjustments resulting from international trade have examined manufacturing industries. While these studies are still relevant, much less is known about adjustment problems encountered by white collar, service-industry workers, who may be more affected by current off-shoring activity.

The proposed service industry studies will have the following four objectives:

- develop estimates of the extent of off-shoring in each of the industries studied and the key economic effects, including direct and indirect employment effects
- quantify the severity of adjustment problems for those workers displaced by off-shoring relative to other reasons for job losses
- determine the adequacy of currently available “official” data in estimating the scope and scale of off-shoring activity and its key economic effects
- demonstrate the value of supplementing official data with other data in improving the estimates of off-shoring activity and its key economic effects

Achieving the first two objectives depends upon the adequacy of currently available data. Given the data difficulties cited in previous off-shoring studies, these objectives are ambitious and highly uncertain, but necessary to accomplish the latter two objectives. The final two objectives should provide a firm basis for any subsequent Panel recommendations to improve current data and analytical techniques for assessing the extent of off-shoring activities and their economic effects.

The planned industry studies will build upon previous off-shoring research that has used transparent and replicable methodologies and verifiable data. However, it will extend that previous research by attempting to link several existing, but independent, data sets at a microlevel to assess the ability of those linked data to produce more complete and reliable estimates of the extent of and effects from off-shoring. This should indicate the value of linking existing data to try to overcome some of the potential data gaps others have identified in developing estimates of off-shoring activity.

In addition to testing the advantages and feasibility of linking current data sets, the research will explore alternatives for combining data from other sources—industry groups, professional organizations, unions, previous studies—with official data to determine whether estimates of off-shoring activity and its economic and employment effects can be further improved. Since new data collections can be both difficult and costly to undertake, the research needs to identify not only data insufficiencies but also the need for and utility of new data. More specifically, the research should establish the value of additional supplementary data, provide some possible alternatives for obtaining the data, and indicate the relative importance of and priority for filling particular data gaps.

INDUSTRY STUDY-SELECTION CRITERIA

Since the industries selected for this additional research can affect the ability to accomplish the industry study objectives, the Panel has identified the following criteria for selecting the industries to be reviewed. The selected industries should be as follows:

- significant in size and overall economic impact
- potentially vulnerable to off-shoring, or at least perceived to be vulnerable from previous studies
- sufficiently diverse to include alternative impacts that off-shoring may have
- growing or have substantial future growth potential
- well integrated into the economy with potential spill-over effects on other sectors (e.g., a significant research and development component)

Within the NAICS, industries at the four-digit level are sufficiently disaggregated to allow for a reasonable degree of consistency among firms included within the category, but still large enough to account for a sizeable amount of employment and economic activity. The selection will concentrate on service industries and use findings from previous studies and reports to increase the probability that some of the firms within those industries are likely to have made, or at least considered, decisions to off-shore activities.

Given these criteria, the Panel has decided to examine the following four-digit industries.¹⁰⁰

- architectural, engineering, and related services (5413)
- computer systems design (5415)

¹⁰⁰ In addition to the four industries listed below, the Panel will consider a fifth industry, which will be either accounting, tax preparation, and bookkeeping services (5412) or research and development (5417) if sufficient time and resources are available.

- business support services (5614)
- pharmaceuticals (3254)

These selected industries produce a range of services and goods, some of which are perceived to be vulnerable to off-shoring. Using a range of service industries with different levels of potential vulnerability to off-shoring will provide better opportunities for analyzing the overall impact of off-shoring. The selected industries have been growing and are expected to continue to expand over the near term. Finally, the selected industries appear to have significant linkages with other major sectors of the U.S. economy, thus providing a potential source of indirect economic effects that off-shoring can generate over the long term.

CRITICAL ISSUES CONCERNING OFF-SHORING EFFECTS

These industry studies should also provide some basic information needed to assess critical issues affecting the impact of off-shoring. The following issues encompass not only effects on U.S. workers and the economy, but also on the educational system:

- adjustment problems endured by workers displaced by off-shoring activities
- economic effects of off-shoring to the United States by foreign countries—so called “in-shoring” effects
- role of temporary workers and foreign students in meeting labor-market needs for particular worker skills
- demographic trends affecting the quality and experience of the U.S. workforce
- ability of the U.S. educational system to meet changing demands for worker skills

Off-Shoring Adjustment Problems

Adjustment problems include the impact of job shifts on workers and communities affected by those changes. Worker adjustment problems involve their reemployment experience, wage and benefit differences between old and new jobs, any training and relocation costs, and other income changes affecting their long-term financial prospects. All workers losing their jobs for any reason face some adjustment problems, but the severity varies substantially, depending upon the ability of the individual worker to adjust to that change. The ability to adjust, in turn, can be affected by the reasons for the job loss, the underlying economic environment, and the characteristics of the workers involved. There are two critical worker adjustment issues for off-shoring: the size and severity of those problems and their significance relative to the problems faced by other displaced workers.

Communities affected by off-shoring job shifts can experience a range of adjustment issues, including changes in economic activity, property values, tax revenues, and demands for social

services. These community adjustment issues will also vary depending upon the concentration and immediacy of the job shifts and their relative size within the community. Large-scale job shifts within a short time span in small isolated communities are likely to impose more severe community adjustment problems than smaller job shifts occurring over an extended time period.

The planned industry studies will attempt to provide some basic information on the scope and scale of off-shoring job shifts. If job shifts from off-shoring are less concentrated and phased over longer time periods than previous job losses in manufacturing (e.g., plant closings), the community adjustment problems may be smaller than in the past. This industry research will also try to distinguish the types and characteristics of workers displaced by off-shoring from other displaced workers. If workers displaced by off-shoring can be distinguished from other displaced workers, then the relative severity of their adjustment problems can be compared. This will require comparing the duration of unemployment, the type of job ultimately obtained, and the change in wages, benefits, and income between the old and new job for those displaced by off-shoring relative to other reasons. Longitudinal data from BLS or Census will be needed for these comparisons.

In-Shoring Effects

Since trade and foreign direct investment flow both ways between trading partners, the economic effects from “in-shoring” need to be addressed in any comprehensive assessment of U.S. off-shoring. In-shoring activities will produce the same range of economic effects as off-shored activities, including both direct and indirect employment effects. However, from a U.S. perspective, the direct employment effects of in-shoring involve shifts in U.S. jobs that occur within foreign affiliates located in the United States and among U.S. suppliers exporting services to foreign firms or consumers.¹⁰¹ The industry studies should produce some data on employment shifts within foreign affiliates, thereby providing a partial measure of the direct employment effects from in-shoring. In addition, these studies may indicate whether there are any significant differences in geographical locations, occupational structures, and other economic characteristics between foreign and domestic firms within the same industries.

Role of Temporary Workers and Foreign Students

Temporary workers and foreign students can affect off-shoring in several ways. They can be a substitute for off-shoring, since U.S. businesses can use temporary workers to meet selected skill shortages. By augmenting and enhancing U.S. human capital, foreign students can help support continued research and development activities and the effective application of new technologies and inventions to improve the competitiveness of U.S. businesses. On the other hand, the return of highly skilled temporary workers and technically trained foreign students to their native countries can enhance the human capital in those countries and provide competitive alternatives

¹⁰¹ Just as off-shoring accounts for only a portion of U.S. services imports, not all U.S. services exports or changes in those exports are due to in-shoring of foreign business activities. As noted in chapter 2, one of the indirect effects from U.S. off-shoring is the potential increase in exports in response to increased foreign demand generated by the off-shored activity. Differential growth rates and relative price changes for particular trading partners will also affect changes in exports and imports between them, independent of any off-shoring or in-shoring activity.

for U.S. businesses seeking to outsource certain functions or activities. It is unclear at this time what effect these returning workers currently have or will have on off-shoring decisions.

Temporary workers and foreign students are two of the major groups included in the Census Bureau's temporary migrant population—non-U.S. citizens who enter the country on specific visas. Temporary migrants are not permitted to live permanently in the United States or work or perform duties other than those specified in their visa, unless granted special permission by the Department of Homeland Security. Temporary migrants provide a means of meeting increased demands for particular skills in the U.S. labor market. Business groups and individual firms seeking such help maintain that this labor-supply source allows them to retain operations within the United States. A recent report by Stephen Yale Loehr (Yale Loehr 2003) suggests that MNCs have used L-1 visas for intracompany transfers of workers from their overseas affiliates to the parent companies in the United States rather than shift work to the overseas affiliate.

Temporary migrants are admitted under dozens of different classes of visas with different requirements and time limitations; the three most critical classes for off-shoring are the student "F" visas, the L-1 visas for intracompany transfers, and the H-1B visas for specialty occupation workers. Of these, only the H-1B visas are subject to a statutory cap established by Congress in 1990. The initial H-1B cap was set at 65,000 workers annually and was raised temporarily to 115,000 in fiscal years (FYs) 1999 and 2000 to respond to Y2K-driven demands for computer programmers, and then to 195,000 for FYs 2001 through 2003 due to expected continued demand for IT professionals (pre-dot.com bubble bust). The cap was lowered to 65,000 again in FY 2004, but has been quickly met in both FY 2004 and FY 2005.

Although several analysts have suggested that some of the employment decline among computer programmers during the 2001 recession and subsequent period may have been absorbed by the return of temporary workers to their native lands, current data on visa issuances and admissions do not show actual use of temporary workers by firms seeking those visas. The proposed industry research will attempt to look at microdata within BLS and Census to determine whether these linked data will support estimates of the number of temporary workers employed in these industries and how temporary worker employment has changed over time. The research will also assess whether better or different data are needed to develop such estimates.

Demographic Trends and Worker Quality Issues

The impending retirement of "baby boomers" over the next decade has raised concerns about the need for skilled replacement workers and the ability to meet those needs given disturbing recent trends regarding dropout rates and educational achievement levels within the United States. These concerns have been reinforced by periodic claims from business groups about difficulties in obtaining sufficiently skilled U.S. workers to meet increasing demands for high-skilled labor. For example, a recent Business Roundtable report noted that "the business community also is concerned that far too many students in our nation's schools are not prepared to succeed in the world economy. The difficulties that today's most vulnerable workers face will persist for the 30 percent of students who leave formal education without a high school diploma and the high school students who graduate but are ill-prepared for either further education or high-skilled

work.”¹⁰² Similarly, the U.S. Chamber of Commerce has noted that “in 1950 80 percent of jobs were classified as unskilled; today about 85 percent are classified as skilled. Almost 80 percent of today’s jobs require some postsecondary education and training. . . . There is troubling evidence that we are failing to meet these educational needs. According to the National Center of Education Statistics, U.S. eighth graders ranked 19th in math, behind top competitors like Singapore, South Korea, Taiwan, Hong Kong, and Japan. By the end of the 1990s more than one-third of job applicants lacked sufficient reading and math skills to do the jobs they sought—up from 19 percent a few years earlier.”¹⁰³

BLS and Census projections of population, labor force participation rate, and the overall U.S. labor force indicate the magnitude of baby boom retirements and their impact on labor force growth after 2010. “The Bureau [BLS] projects that between 2000 and 2010 labor force growth will slow to 1.1 percent per year, and after the retirement of the baby boomers, between 2010 and 2020, labor force growth will slow to 0.4 percent per year.”¹⁰⁴ If these emerging labor quality issues and projected declines in the U.S. labor force materialize, businesses may try to meet increased demands for specific skills through various means, including technological changes (e.g., substituting different forms of capital for the skilled labor in short supply), increased use of legal immigrants, or off-shoring business activities requiring skills in short supply domestically but more abundant overseas).

As described in Chapter 2, a business decision to off-shore certain functions or activities is highly complex, involving a number of different elements and risks. Additional research in this area will try to assess the significance of potential changes in the quality and experience of the U.S. workforce relative to other determinants of off-shoring. In addition, the research will try to examine how off-shoring opportunities may affect projected changes in occupational structures for firms within the industry and the implications for future demands for particular skills.

Off-Shoring Implications for Education and Training

The research on demographic trends and worker quality issues will also help identify some of the implications for the U.S. education and training system. Some groups, particularly those representing professionals perceived to be vulnerable to off-shoring (e.g., IEEE), raise concerns that off-shoring activities have created declining employment prospects for their members (e.g., engineers and computer programmers), which in turn discourage students from seeking training in these disciplines. Some academics, such as Richard Freeman, have noted that the emergence of large populous countries, like China and India, into the global labor market create conditions that will challenge the current U.S. dominance in developing and employing scientific and engineering workers and researchers. Specifically, Freeman claims that “changes in the global job market for science and engineering workers is eroding U.S. dominance in science and engineering and that erosion will continue into the foreseeable future, diminishing the country’s comparative advantage in high-tech goods and services and threatening the country’s global

¹⁰² Business Roundtable, *Securing Growth and Jobs: Improving U.S. Prosperity in a Worldwide Economy* (Washington, D.C.: Business Roundtable, March 2004), 23.

¹⁰³ U.S. Chamber of Commerce, *Jobs, Trade, Sourcing*, 21.

¹⁰⁴ Michael W. Horrigan, “Employment Projections to 2012: Concepts and Context,” *Monthly Labor Review* (February 2004): 10.

economic leadership.”¹⁰⁵ Freeman notes that in 2003 China graduated 700,000 BS engineers while the United States graduated only 60,000. He also compares the rapid growth in the number of Ph.D.s awarded in science and engineering in a number of major Asian and European countries relative to the United States.

Other analysts draw less stark conclusions from a review of similar data. MGI, for instance, notes that there are a number of constraints that limit the availability of high-skilled foreign labor for off-shoring. Others (Bhagwati, RAND Corporation) note that continued increased demand for such high-skilled labor, both within the United States and in foreign countries, must be considered in examining the differential growth rates of Ph.D.s. Moreover, Freeman also acknowledges that the United States has a number of significant advantages that will help it adjust to changes in the supply of highly skilled workers. “The high mobility of the U.S. workforce should make some adjustments more palatable than would be the case if Americans were less willing to move location or change their occupation or industry. And the U.S. has developed a set of institutions and modes of scientific research that will help keep the country at the technological frontier. American scientists and engineers collaborate regularly with scientists and engineers in other countries. American universities are more closely linked to business and the economy than those in other countries.”¹⁰⁶

Since the number of foreign-trained engineers, scientists, and high-skilled technical workers has been increasing for some time, the impact of this trend needs to be examined.¹⁰⁷ In particular, has the rapid increase in the supply of particular high-skilled workers had any significant impact in the United States on the employment and earnings of workers in occupations requiring those specific skills? Additional research will also examine the effectiveness of the information exchanges between the U.S. labor market and the education and training system in guiding student training choices and in institutional choices regarding the types of skill training to be supplied. If off-shoring activities are significantly affecting employment and earnings opportunities for particular skills and occupations—or if they may do so in the future—then how quickly and effectively students and the educational system respond to these effects are major policy concerns.

¹⁰⁵ Richard B Freeman, *Does Globalization of the Scientific/Engineering Workforce Threaten U.S. Economic Leadership?*, (Cambridge, Massachusetts: National Bureau of Economic Research, April 2005), 2.

¹⁰⁶ *Ibid.*, 31.

¹⁰⁷ Freeman notes that the ratio of foreign to U.S. Ph.D.s in science and engineering had already increased for Europe and China between 1989 [1.22 Europe, 0.05 China] and 2003 [1.62 Europe, .49 China].

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SELECTED BIBLIOGRAPHY

Off-Shoring Project

- Abowd, John M., John Haltiwanger, and Julia Lane. [“Integrated Longitudinal Employee-Employer Data for the United States.”](#) *American Economic Review* 94 (2) (May 2004): 224-229.
- Abowd, John M., Paul Lengermann, and Kevin L. McKinney. [*The Measurement of Human Capital in the U.S. Economy.*](#) Washington, D.C.: U.S. Census Bureau, March 2003.
- AFL-CIO. *Issue Brief: [The Bush Record on Shipping Jobs Overseas.](#)* Washington, D.C.: AFL-CIO, August 2004.
- _____. [“Corporate Myths about Shipping Jobs Overseas.”](#) AFL-CIO. http://www.aflcio.org/yourjobeconomy/jobs/outsourcing_myths.cfm (accessed 2005).
- _____. [“Corporations Doubled the Number of Jobs Sent Overseas in Three Years.”](#) News for Working Families, October 20, 2005. AFL-CIO. <http://www.aflcio.org/yourjobeconomy/jobs/ns10202004.cfm>
- _____. [“Crisis in Manufacturing.”](#) Washington, D.C.: AFL-CIO, 2004.
- _____. [“Declining Job Quality: Here to Stay?”](#) Washington, D.C.: AFL-CIO, 2004.
- _____. [“Outsourcing America.”](#) Washington, D.C.: AFL-CIO, 2004.
- _____. [“Shipping Jobs Overseas: How Real Is the Problem?”](#) Washington, D.C.: AFL-CIO, 2005.
- Aggrawal, Swati, Terry Levine, and Brian Jennings. [“Outsourcing: Perspectives and its Economic Impact.”](#) Presentation. 2005.
- Agrawal, Vivek and Diana Farrell. [“Who Wins in Offshoring.”](#) *The McKinsey Quarterly*, 2003 *Special Edition: Global Directions* (2003).
- Agrawal, Vivek, Diana Farrell, and Jaana K. Remes. [“Offshoring and Beyond.”](#) *The McKinsey Quarterly*, 2003 *Special Edition: Global Directions* (2003).
- Ahearn, Raymond J. [*U.S.-European Union Trade Relations: Issues and Policy Challenges.*](#) IB10087. Washington, D.C.: Congressional Research Service, March 2003.
- Allegretto, Sylvia, Jared Bernstein, and Isaac Shapiro. [*The Lukewarm 2004 Labor Market: Despite Some Signs of Improvement, Wages Fell, Job Growth Lagged, and*](#)

- [Unemployment Spells Remained Long.](#) Washington, D.C.: Economic Policy Institute, February 2005.
- American Enterprise Institute for Public Policy Research. [Polls on NAFTA: A 10-Year Review.](#) Washington, D.C.: AEI, December 2003.
- _____. [“Summary: Domestic Effects of Foreign Direct Investment.”](#) AEI Conference on Domestic Effects of Foreign Direct Investment, December 2, 2004.
- Amiti, Mary and Shang-Jin Wei. [Fear of Service Outsourcing: Is it Justified?](#) WP/04/186. Washington, D.C.: International Monetary Fund, October 2004.
- Antrás, Pol and Elhanan Helpman. [“Global Sourcing.”](#) *Journal of Political Economy* 112 (3) (June 2004): 552-580.
- Antrás, Pol, Luis Garicano, and Esteban Rossi-Hansberg. [Offshoring in a Knowledge Economy.](#) Cambridge, MA: National Bureau of Economic Research, January 2005.
- Arora, Ashish. [“From Underdogs to Tigers: The Emerging Offshore Software Industries and the US Economy.”](#) Presentation at Brookings Trade Forum 2005: Offshoring White-Collar Work–The Issues and the Implications, May 12-13, 2005.
- A.T. Kearney. [A.T. Kearney’s 2004 Offshore Location Attractiveness Index: Making Offshore Decisions.](#) Chicago: A.T. Kearney, Inc., 2004.
- Atkinson, Robert. [Meeting the Offshoring Challenge.](#) Washington, D.C.: Progressive Policy Institute, July 2004.
- _____. [Understanding the Offshoring Challenge.](#) Washington, D.C.: Progressive Policy Institute, May 2004.
- Baily, Martin N. and Diana Farrell. [Exploding the Myths about Offshoring.](#) McKinsey Global Institute, April 2004.
- Baily, Martin Neil and Robert Z. Lawrence. [“Don’t Blame Trade for U.S. Job Losses.”](#) *The McKinsey Quarterly* 1 (2005).
- _____. [“What Happened to the Great US Job Machine? The Role of Trade and Electronic Offshoring.”](#) *Brookings Papers on Economics Activity* 2 (2004).
- Balaker, Ted, and Adrian T. Moore. [Offshoring and Public Fear: Assessing the Real Threat to Jobs.](#) Reason Foundation, May 2005.
- Balasubramanian, Ramnath and Asutosh Padhi. [“The Next Wave in US Offshoring.”](#) *The McKinsey Quarterly* 1 (2005).

- Bardhan, Ashok Deo and Dwight Jaffee. [*On Intra-Firm Trade and Multinationals: Foreign Outsourcing and Offshoring in Manufacturing.*](#) Berkeley, CA: University of California, April 2004.
- Bardhan, Ashok Deo and Cynthia A. Kroll. [*The New Wave of Outsourcing.*](#) Berkeley, CA: Fisher Center for Real Estate and Urban Economics, University of California, 2003.
- Barfield, Claude. [*High-Tech Protectionism: The Irrationality of Antidumping Laws.*](#) Washington, D.C.: AEI Press, 2003.
- Barnow, Burt S. and Christopher T. King. [*The Workforce Investment Act in Eight States.*](#) Washington, D.C.: U.S. Department of Labor, February 2005.
- Barry, Frank and Desiree van Welsum. “[Services FDI and Offshoring into Ireland.](#)” Paper prepared for the Organisation for Economic Co-operation and Development Directorate for Science, Technology and Industry Panel Session on Offshoring, June 9-10, 2005.
- Bartelsman, Eric, Stefano Scarpetta, and Fabiano Schivardi. [*Comparative Analysis of Firm Demographics and Survival: Micro-Level Evidence for the OECD Countries.*](#) Paris: OECD, 2003.
- Batt, Rosemary, Virginia Doellgast, and Hyunji Kwon. “[A Comparison of Service Management and Employment Systems Among In-house, Outsourced, and Offshore Call Centers.](#)” Paper prepared for the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and Implications, Washington, D.C., May 12-13, 2005.
- Bayoumi, Tamin, and Marcus Haacker. [*It’s Not What You Make, It’s How You Use It: Measuring the Welfare Benefits of the IT Revolution Across Countries.*](#) Discussion Paper 3555. London: Centre for Economic Policy Research, September 2002.
- Benedetto, Gary, et al. [*Using Worker Flows to Measure Firm Dynamics.*](#) Washington, D.C.: U.S. Census Bureau, May 2004.
- Bergmann, Markus, Ramesh Mangaleswaran, and Glenn A. Mercer. “[Global Sourcing in the Auto Industry.](#)” *The McKinsey Quarterly, 2004 Special Edition: China Today* (2004).
- Berman, Jay M. “[Industry Output and Employment Projections to 2012.](#)” *Monthly Labor Review* (February 2004): 58-79.
- Bernard, Andrew B., J. Bradford Jensen, and Peter K Schott. [*Falling Trade Costs, Heterogeneous Firms, and Industry Dynamics.*](#) March 2004.
- _____. “[Importers, Exporters, and Multinationals: A Portrait of Firms in the U.S. that Trade Goods.](#)” April 2005.

- Bhagwati, Jagdish, Arvind Panagariya, and T.N. Srinivasan. [“The Muddles over Outsourcing.”](#) *The Journal of Economic Perspectives* 18(4) (Fall 2004): 93-114.
- _____. [Why Your Job Isn't Moving to Bangalore.](#) Washington, D.C.: American Enterprise Institute for Public Policy Research, March 2004.
- Bivens, Josh. [Shifting Blame for Manufacturing Job Loss: Effect of Rising Trade Deficit Shouldn't be Ignored.](#) Washington D.C.: Economic Policy Institute, undated.
- Borga, Maria. [“Trends in Employment at U.S. Multinational Companies: Evidence from Firm-Level Data.”](#) Paper presented at the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and Implications, Washington, D.C., May 12-13, 2005.
- Borga, Maria and Michael Mann. [“Cross-Border Trade in 2002 and Sales Through Affiliates in 2001.”](#) *Survey of Current Business* (October 2003): 58-118.
- _____. [“Cross-Border Trade in 2003 and Sales Through Affiliates in 2002.”](#) *Survey of Current Business* (October 2004): 25-76.
- Borga, Maria and William J. Zeile. [International Fragmentation of Production and the Intrafirm Trade of U.S. Multinational Companies.](#) WP2004-02. Washington, D.C.: U.S. Bureau of Economic Analysis, January 2004.
- Bottino, Susan J. [Perspective on Offshoring and New Jersey.](#) Trenton, N.J.: New Jersey Policy Perspective, August 2004.
- Brainard, Lael and Robert E. Litan. [“Offshoring’ Service Jobs: Bane or Boon—and What to Do?”](#) *The Brookings Institution Policy Brief #132* (April 2004).
- Brainard, Lael, Robert E. Litan, and Nicholas Warren. [“A Fairer Deal for America’s Workers in a New Era of Offshoring.”](#) Paper presented at the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and Implications, Washington, D.C., May 12-13, 2005.
- Brandt, Nicola. [Business Dynamics in Europe.](#) Paris: Organisation for Economic Co-operation and Development, 2004.
- _____. [Business Dynamics, Regulation and Performance.](#) Paris: Organisation for Economic Co-operation and Development, 2004.
- Bronfenbrenner, Kate. [“Uneasy Terrain: The Impact of Capital Mobility on Workers, Wages, and Union Organizing.”](#) Submitted to the U.S. Trade Deficit Review Commission, September 2000.
- Bronfenbrenner, Kate and Stephanie Luce. [The Changing Nature of Corporate Global Restructuring: The Impact of Production Shifts on Jobs in the US, China, and Around the](#)

- [Globe](#). Washington, D.C.: U.S.-China Economic and Security Review Commission, October 2004.
- Brown, Clair, John Haltiwanger, and Julia Lane. [“Economic Turbulence: The Impact on Workers, Firms and Economic Growth.”](#) 2005. [NOT FOR CITATION – UNPUBLISHED BOOK]
- Brown, Clair and Greg Linden. [“Offshoring in the Semiconductor Industry: A Historical Perspective.”](#) Prepared for the 2005 Brookings Trade Forum 2005: Offshoring of White-Collar Work—the Issues and Implications, Washington, D.C., May 12-13, 2005.
- Brown, Sharon P. [“Mass Layoff Statistics and Domestic and Overseas Relocation.”](#) Presented at the Brookings Institution Data Workshop on Offshoring, Washington, D.C., June 2004.
- _____. [“Mass Layoff Statistics Data in the United States and Domestic and Overseas Relocation.”](#) Presented at the EU-US Seminar on Offshoring of Services in ICT and Related Services, Brussels, Belgium, December 13-14, 2004.
- Bulkeley, William M. [“IBM Documents Give Rare Look at Sensitive Plans on ‘Offshoring.’”](#) *Wall Street Journal* (January 19, 2004).
- Business Roundtable. [Economic Growth and Job Creation: What Do Americans Think?](#) Washington, D.C.: Undated.
- _____. [How to Secure U.S. Economic Growth and Jobs in the Worldwide Economy.](#) Washington, D.C.: Undated.
- _____. [How to Secure U.S. Economic Growth and Jobs in the Worldwide Economy: U.S. Facts.](#) Washington, D.C.: Undated.
- _____. [Securing Growth and Jobs: Improving U.S. Prosperity in a Worldwide Economy.](#) Washington, D.C.: March 2004.
- Cato Institute. [Cato Handbook for Congress: Policy Recommendations for the 108th Congress.](#) Washington, D.C.: Cato Institute, undated.
- Clark, Kelly A. and Rosemary Hyson. [“New Tools for Labor Market Analysis: JOLTS.”](#) *Monthly Labor Review* (December 2001).
- Clausing, Kimberly. [“The Role of U.S. Tax Policy in Offshoring.”](#) Presented at the Brookings Trade Forum 2005: Offshoring of White-Collar Work—the Issues and Implications, Washington, D.C., May 12-13, 2005.
- [“Companies that Outsource Offshore According to Lou Dobbs.”](#)

- Computer Systems Policy Project. [*Choose to Compete: How Innovation, Investment and Productivity Can Grow U.S. Jobs and Ensure American Competitiveness in the 21st Century.*](#) Washington, D.C.: Computer Systems Policy Project, January 2004.
- _____. [*“Ten Common Myths about Worldwide Sourcing.”*](#) Washington, D.C.: Computer Systems Policy Project, undated.
- Craig, David and Paul Willmott. [*“Outsourcing Grows Up.”*](#) *The McKinsey Quarterly* (February 2005).
- Deloitte Consulting. [*Calling a Change in the Outsourcing Market: The Realities for the World’s Largest Organizations.*](#) Deloitte Development LLC, April 2005.
- Deloitte Research. [*Business in China, the Next Stage: The Fifth Modernization.*](#) Deloitte Touche Tohmatsu, 2005.
- _____. [*The Cusp of a Revolution: How Offshoring will Transform the Financial Services Industry.*](#) Deloitte Consulting, 2003.
- _____. [*Inside Outsourcing: The What, Who, and How of Outsourcing IT-Intensive Processes.*](#) Deloitte Consulting, 2003.
- _____. [*The Macro-Economic Case for Outsourcing.*](#) Deloitte Consulting, 2003.
- _____. [*Making the Off-Shore Call: The Road Map for Communications Operators.*](#) Deloitte Touche Tohmatsu, 2004.
- _____. [*The Titans Take Hold: How Offshoring Has Changed the Competitive Dynamic for Global Financial Services Institutions.*](#) Deloitte Development LLC, 2004.
- Desai, Mihir A., C. Fritz Foley, and James R. Hines, Jr. [*Chains of Ownership, Regional Tax Competition, and Foreign Direct Investment.*](#) Working paper 9224. Cambridge, MA: National Bureau of Economic Research, 2002.
- _____. [*“Foreign Direct Investment and Domestic Economic Activity.”*](#) AEI Conference on Domestic Effects of Foreign Direct Investment, December 2, 2004.
- _____. [*International Joint Ventures and the Boundaries of the Firm.*](#) Working paper 9115. Cambridge, MA: National Bureau of Economic Research, 2002.
- Doig, Stephen J., et al. [*“Has Outsourcing Gone Too Far?”*](#) *The McKinsey Quarterly* 4 (2004).
- Dossani, Rafiq. [*“Globalization and the Outsourcing of Services: The Impact of Indian Offshoring.”*](#) In *Offshoring White-Collar Work—The Issues and Implications, The Brookings Trade Forum, 2005*, edited by Lael Brainard and Susan M. Collins. Washington, D.C.: The Brookings Institution, forthcoming.

- Dossani, Rafiq and Martin Kenney. [*Went for Cost, Stayed for Quality? Moving the Back Office to India.*](#) December 2003.
- Dryburgh, Heather, and Jason Hamel. "[Immigrants in Demand: Staying or Leaving?](#)" Statistics Canada, *Canadian Social Trends* (Autumn 2004): 12-17.
- Dudley, Bill, et al. "[Offshoring: Where Have all the Jobs Gone?](#)" Goldman Sachs, *US Economics Analyst* 3/38 (September 19, 2003).
- Economic Policy Institute. [*EPI Issue Guide: Offshoring.*](#) Washington, D.C.: EPI, undated.
- [Eurostat Progress Report to the Voorburg Group](#), September 23, 2003. Presented at the 18th Meeting of the Voorburg Group, Tokyo, Japan, October 2003.
- Faberman, R. Jason. [*Gross Job Flows Over the Past Two Business Cycles: Not all "Recoveries" are Created Equal.*](#) Working paper 372. Washington, D.C.: U.S. Bureau of Labor Statistics, June 2004.
- Farrell, Diana, Sacha Ghai, and Tim Shavers. "[A Silver Lining in the US Trade Deficit.](#)" *The McKinsey Quarterly* (March 2005).
- Farrell, Diana and Adil S. Zainulbhai. "[A Richer Future for India.](#)" *The McKinsey Quarterly, 2004 Special Edition: What Global Executives Think* (2004).
- Feenstra, Robert C. and Gordon H. Hanson. [*Global Production Sharing and Rising Inequality: A Survey of Trade and Wages.*](#) Working paper 8372. Cambridge, MA: National Bureau of Economic Research, June 2001.
- _____. "[The Impact of Outsourcing and High-Technology Capital on Wages: Estimates for the United States, 1979-1990.](#)" *The Quarterly Journal of Economics* 114 (3) (August 1999): 907-940.
- Feliciano, Zadia and Robert E. Lipsey. [*Foreign Entry into U.S. Manufacturing by Takeovers and the Creation of New Firms.*](#) Working paper 9122. Cambridge, MA: National Bureau of Economic Research, September 2002.
- Freeman, Richard B. "[Does Globalization of the Scientific/Engineering Workforce Threaten U.S. Economic Leadership?](#)" Prepared for the Innovation Policy and the Economy Conference, Washington, D.C., 19 April 2005.
- _____. [*Doubling the Global Work Force: The Challenge of Integrating China, India, and the Former Soviet Bloc into the World Economy.*](#) Washington, D.C.: Institute for International Economics, November 2004.

- Fung, K.C., Lawrence J. Lau, and Joseph S. Lee. "[General Characteristics of U.S. Direct Investment.](#)" In *U.S. Direct Investment in China*. Washington, D.C.: American Enterprise Institute, 2004.
- Gareiss, Robin. "[Analyzing the Outsourcers.](#)" *Information Week* (November 18, 2002).
- Garner, C. Alan. "[Offshoring in the Service Sector: Economic Impact and Policy Issues.](#)" Federal Reserve Bank of Kansas City, *Economic Review* (Third Quarter 2004): 5-37.
- Glassman, James K. and Kevin A. Hassett. [Understanding the Role of the United States in the Global Economy.](#) Washington, D.C.: AEI, August 2003.
- Global Insight. [Executive Summary: The Comprehensive Impact of Offshore IT Software and Services Outsourcing on the U.S. Economy and the IT Industry.](#) Lexington, MA: Global Insight (USA), Inc.: 2004.
- _____. [The Estimated Impact of Offshore IT Software and Services Outsourcing on Each State Economy, 2003 and 2008.](#) Lexington, Massachusetts: Global Insight (USA), Inc., March 2004.
- Global Insight and Information Technology Association of America. "[The Comprehensive Economic Impact of Offshore IT Software and Services Outsourcing in the United States.](#)" Presentation at the National Press Club, Washington, D.C., March 30, 2004.
- "[Globalisation: Coping with the Challenge.](#)" Editorial, *OECD Employment Outlook*(Organisation for Economic Co-operation and Development, Paris) (2005).
- Goodman, William C. "[Employment in Services Industries Affected by Recessions and Expansions.](#)" *Monthly Labor Review* (October 2001): 3-11.
- Goolsby, Kathleen, Todd Furniss, and F. Keaton Whitlow. [An Assessment of the Outsourcing Market in the Banking Sector of Japan's Financial Institutions Industry.](#) Dallas: Everest Group, 2002.
- Griswold, Daniel T. "[Why We Have Nothing to Fear from Foreign Outsourcing.](#)" *Free Trade Bulletin* (Cato Institute, Washington, D.C.) 10 (March 2004).
- Groshen, Erica L. and Simon Potter. "[Has Structural Change Contributed to a Jobless Recovery?](#)" *Current Issues in Economics and Finance* (Federal Reserve Bank of New York) 9 (8) (August 2003).
- Grossman, Gene. "[Offshoring and Outsourcing: Lessons from the Theory of the Firm.](#)" Presentation, undated.
- Grossman, Gene M. and Elhanan Helpman. "[Outsourcing in a Global Economy.](#)" September 2001.

- Hagel, John, III. [“Offshoring Goes on the Offensive.”](#) *The McKinsey Quarterly* 2 (2004).
- Hanson, Gordon H., Raymond J. Mataloni, Jr., and Matthew J. Slaughter. [Expansion Abroad and the Domestic Operations of U.S. Multinational Firms.](#) Washington, D.C.: National Bureau of Economic Research, September 2003.
- Harrington, Paul E. [“Understanding & Responding to Imbalances in Engineering & IT Labor Markets.”](#) Presentation to Business Roundtable, Northeastern University, September 15, 2004.
- Hassett, Kevin A. [“Discussion of Desai, Foley and Hines.”](#) AEI Conference on Domestic Effects of Foreign Direct Investment, December 2, 2004.
- Hecker, Daniel E. [“Occupational Employment Projections to 2012.”](#) *Monthly Labor Review* (February 2004).
- Helpman, Elhanan, Marc J. Melitz, and Stephen R. Yeaple. [Export versus FDI.](#) Discussion Paper #1998. Cambridge, MA: Harvard Institute of Economic Research, 2003.
- Hira, Ronil. [“Global Outsourcing of Engineering Jobs: Recent Trends and Possible Implications.”](#) Testimony to the Committee on Small Business, U.S. House of Representatives, June 18, 2003.
- _____. [“Homeland Security and the Technology Sector.”](#) Testimony to the Senate Commerce, Science, and Transportation Subcommittee on Science, Technology and Space, April 24, 2002.
- _____. [“The Offshoring of High-Skilled Jobs.”](#) Testimony to the Committee on Small Business, U.S. House of Representatives, October 20, 2003.
- _____. [“The Other Side of the Outsourcing Debate.”](#) Transcript, Washingtonpost.com Live Discussion, May 2, 2005 <<http://www.washingtonpost.com/wp-dyn/articles/A36379-2004Mar30.html>>.
- _____. [Letter to Congressman Frank Wolf](#), April 21, 2004.
- Hong, Eun-Pyo. [“OECD Activity on the Short-Term Indicators for Services.”](#) Presented at 18th Voorburg Group Meeting, Tokyo, October 2003.
- Horrigan, Michael W. [“Employment Projections to 2012: Concepts and Context.”](#) *Monthly Labor Review* (February 2004).
- Houghton, John W. and Graham Vickery. [Digital Delivery of Business Services.](#) Paris: Organisation for Economic Co-operation and Development, 2004.

- Hubbard, Glenn. [“Does the Tax System Create Excessive Incentives to Move Activity Abroad?”](#) Remarks at International Tax Policy Forum, AEI Conference on Domestic Effects of Foreign Direct Investment, December 2, 2004.
- Hughes, Kent H. [“Introduction: Meeting the New Economic Challenge: Forging an American Dream for the Twenty-First Century.”](#) In *Building the Next American Century*. Baltimore, Maryland: The Johns Hopkins University Press, February 2005.
- Information Technology Association of America. [ITAA Global Sourcing Principles](#). Arlington, Virginia: ITAA, August 2003.
- _____. [Race to the Horizon: Competition, Innovation and Enlightened Public Policy Must Drive the U.S. IT Industry in the Next Four Years](#). Arlington, Virginia: ITAA, January 2005.
- The Institute of Electrical and Electronics Engineers. [Summary Report: IEEE-USA Salary & Fringe Benefit Survey, 2004 Edition](#). The Institute of Electrical and Electronics Engineers, Inc., 2004.
- _____. [2004 IEEE-USA Unemployment Survey Results \(11/29/2004\)](#). The Institute of Electrical and Electronics Engineers, Inc., 2004.
- _____. [“Position: Offshore Outsourcing—As Approved by the IEEE-USA Board of Directors, March 2004.”](#) The Institute of Electrical and Electronics Engineers, Inc., 2004.
- Interindustry Economic Research Forum (Inforum). [“The Trade and Economic Impacts of U.S. Currency Valuation: A Global Modeling Analysis.”](#) Submitted to the Department of Commerce International Trade Administration. January 2005.
- Irwin, Douglas A. [“Outsourcing” is Good for America](#). Washington, D.C.: American Enterprise Institute for Public Policy Research, February 2004.
- _____. [“U.S. Direct Investment Abroad: A Historical Perspective.”](#) Presented at AEI Conference on *Domestic Effects of Foreign Direct Investment*, December 2, 2004.
- Jaffee, Dwight. [“Globalization, Offshoring, and Economic Convergence: A Synthesis.”](#) Presented at the Understanding Global Outsourcing Conference, Stern School of Business, December 10, 2004.
- Jain, Kuldeep P., Nigel A. S. Manson, and Shirish Sankhe. [“The Right Passage to India.”](#) *The McKinsey Quarterly* (February 2005).
- Jensen, J. Bradford and Lori G. Kletzer. [“Tradable Services: Understanding the Scope and Impact of Services Offshoring.”](#) Presentation, undated.

- _____. [“Tradable Services: Understanding the Scope and Impact of Services Offshoring.”](#) Paper prepared for Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and the Implications, May 12-13, 2005.
- “[Jobs Lost to Outsourcing Underestimated, Study Concludes.](#)” *The Business Journal* (October 20, 2004).
- Kalakota, Ravi and Marcia Robinson. [“Five Reasons Why Offshore Outsourcing Projects Fail.”](#) *Sterling Hoffman Executive Search Newsletter* (undated).
<http://www.sterlinghoffman.com/cgi-in/index.pl?p=newsletter/articles/article112.html>
 (May 2, 2005).
- Karamouzis, Frances, et al. [Gartner’s Global Offshore Sourcing Predictions](#), COM-22-9634. Stamford, CT: Gartner Inc., 2004.
- Kazmierczak, Matthew F. and Josh James. [“Losing the Competitive Advantage? The Challenge for Science and Technology in the United States.”](#) Washington, D.C.: American Electronics Association, February 2005.
- Kirkegaard, Jacob Funk. [Outsourcing and Offshoring: Pushing the European Model Over the Hill, Rather Than Off the Cliff!](#), WP 05-1. Washington, D.C.: Institute for International Economics, March 2005.
- _____. [Outsourcing—Stains on the White Collar?](#) Washington, D.C.: Institute for International Economics, 2003.
- Kleinert, Jörn. [“Globalization: Empirical Overview and Theoretical Explanations.”](#) In *The Role of Multinational Enterprises in Globalization*. New York: Springer, 2004.
- Kletzer, Lori G. [Job Loss from Imports: Measuring the Costs](#). Washington, D.C.: Institute for International Economics, 2001.
- _____. [“Measuring the Costs of Trade-Related Job Loss.”](#) Testimony prepared for the Committee on Finance, U.S. Senate, July 20, 2001.
- Koch, Christopher. [“Backlash.”](#) *CIO Magazine* (September 1, 2003).
- Kozlow, Ralph H. [“An Overview of U.S. Bureau of Economic Analysis Statistics on Multinational Companies.”](#) Prepared for the OECD *Workshop on International Investment Statistics*, Paris, France, 22-24 March 2004.
- Kozlow, Ralph H. and Maria Borga. [“Offshoring” and the U.S. Balance of Payments.](#) U.S. Bureau of Economic Analysis, WP2004-05 (July 16, 2004). Presented at the Brookings Institution, Washington, D.C., June 22, 2004.

- Krantz, Rachel. [“Employment in Business Services: A Year of Unprecedented Decline.”](#) *Monthly Labor Review* (April 2002): 17-24.
- Kroll, Cynthia A. [At-Risk Occupations](#). September 2004.
- _____. [State and Metropolitan Area Impacts of the Offshore Outsourcing of Business Services and I.T.](#) Working Paper 05-293. Berkeley, CA: Fisher Center for Real Estate and Urban Economics, University of California, 2003.
- Landefeld, J. Steven and Ralph Kozlow. [“Globalization and Multinational Companies: What are the Questions, and How Well are we Doing in Answering them?”](#) Presented at the Conference of European Statisticians, Globalization Seminar, Geneva, June 10-12, 2003.
- Landefeld, Steven J. and Raymond Mataloni. [“Offshore Outsourcing and Multinational Companies.”](#) U.S. Bureau of Economic Analysis WP2004-06 (July 16, 2004). Presented at the Brookings Institution, Washington, D.C., June 22, 2004.
- Leamer, Edward E. [Effort, Wages, and the International Division of Labor](#). Working Paper 5803. Cambridge, MA: National Bureau of Economic Research, October 1996.
- _____. [Trade, Wages and Revolving Door Ideas](#). Working Paper 4716. Cambridge, MA: National Bureau of Economic Research, April 1994.
- Leamer, Edward E. and James Levinsohn. [International Trade Theory: The Evidence](#). Working Paper 4940. Cambridge, MA: National Bureau of Economic Research, November 1994.
- Leamer, Edward E. and Michael Storper. [The Economic Geography of the Internet Age](#). Working Paper 8450. Cambridge, MA: National Bureau of Economic Research, August 2001.
- Levine, Linda. [Offshoring \(a.k.a. Offshore Outsourcing\) and Job Insecurity Among U.S. Workers](#). CRS Report to Congress (RL32292). Washington, D.C.: Congressional Research Services, June 18, 2004.
- Levy, Frank and Ari Goelman. [“Offshoring and Radiology.”](#) Presented at Brookings Trade Forum 2005: Offshoring White-Collar Work–The Issues and the Implications, May 12-13, 2005.
- Lieberman, Joseph I. [Letter to Donald Evans and Elaine Chao](#). December 13, 2004.
- _____. [Dear Colleague letter](#). December 15, 2005.
- _____. [“Data Dearth in Offshore Outsourcing: Policymaking Requires Facts.”](#) December 2004.
- _____. [“Offshore Outsourcing and America’s Competitive Edge: Losing Out in the High Technology R&D and Services Sectors.”](#) May 11, 2004.

- Lindsey, Brink. [*Job Losses and Trade: A Reality Check*](#). Trade Briefing Paper No. 19. Washington, D.C.: Cato Institute, March 2004.
- Lipsey, Robert E. “[Foreign Production by U.S. Firms and Parent Firm Employment](#).” In *Multinational Firms and Impacts on Employment, Trade and Technology*. London: Routledge, 2002.
- Lipsey, Robert E. and Jean-Louis Mucchielli. “[Introduction](#).” In *Multinational Firms and Impacts on Employment, Trade and Technology*. London: Routledge, 2002.
- Lloyd, Emily and Charlotte Mueller. “[Payroll employment grows in 2004](#).” *Monthly Labor Review* (March 2005): 18-31.
- Lopez-Bassols, Vladimir. [*ICT Skills and Employment*](#). Paris: Organisation for Economic Co-operation and Development, 2002.
- Makin, John H. “[America Demands; China Supplies](#).” *American Enterprise Institute Online* (March 19, 2004). http://www.aei.org/publications/pubID.20142,filter.all/pub_detail.asp.
- Mankiw, N. Gregory, Kristin J. Forbes, and Harvey S. Rosen. “[The Economic Report of the President](#).” Testimony before the Joint Economic Committee, U.S. Congress, February 10, 2004.
- Mann, Catherine L. “[Global Sourcing: The Information Technology Example](#).” Presented February 7, 2005 at the Cosmos Club, Washington, D.C.
- _____. “[Global Sourcing & High Tech Jobs: Productivity Gains & Policy Challenges](#).” Presented March 11, 2004.
- _____. “[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.
- _____. [*Globalization of Services: Why, How Much, and What to do About it: Some Issues for the North and for the South*](#). February 2004.
- _____. “[Offshore Outsourcing and the Globalization of U.S. 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, 2005.
- _____. [*Prices for International Services Transactions*](#). Washington, D.C.: U.S. Bureau of Labor Statistics, September 2004.
- _____. [*This is Bangalore Calling: Hang Up or Speed Dial?*](#) Cleveland: Federal Reserve Bank of Cleveland, January 2005.

- Mariotti, Sergio and Lucia Piscitello. "[Foreign Direct Investment and Employment: Home Country Experience in Italy.](#)" In *Multinational Firms and Impacts on Employment, Trade and Technology*. London: Routledge, 2002.
- Markusen, James R. "[Modeling the Offshoring of White-Collar Services: From Comparative Advantage to the New Theories of Trade and FDI.](#)" Prepared for the Brookings Trade Forum 2005: Offshoring White-Collar Work: The Issues and Implications, May 12-13, 2005.
- Mataloni, Raymond J., Jr. "[U.S. Multinational Companies: Operations in 2002.](#)" *Survey of Current Business* (July 2004): 10-29.
- Mattoo, Aaditya and Sacha Wunsch. [Preempting Protectionism in Services: The GATS and Outsourcing.](#) January 2004.
- McCarthy, John C. [Near-Term Growth of Offshoring Accelerating.](#) Cambridge, MA: Forrester Research, Inc., 2004.
- McKinsey Global Institute. [The Emerging Global Labor Market.](#) San Francisco: McKinsey and Company, 2005.
- _____. [Offshoring: Is it a Win-Win Game?](#) San Francisco, CA: McKinsey and Company, August 2003.
- "[The McKinsey Global Survey of Business Executives, July 2004.](#)" *The McKinsey Quarterly Special Edition: What Global Executives Think* (2004).
- McNeil, Lawrence R. and Barbara M. Fraumeni. "[International Trade and Economic Growth: A Possible Methodology for Estimating Cross-Border R&D Spillovers.](#)" Presented at the National Bureau of Economic Research Productivity Meeting, Cambridge, MA, March 4, 2005.
- "[Measuring Globalization 2001](#)"
- Mehlman, Bruce P. [Offshore Outsourcing and the Future of American Competitiveness.](#) Washington, D.C.: U.S. Department of Commerce, October 2003.
- Meltzer, Allan H. [A Jobless Recovery?](#) Washington, D.C.: American Enterprise Institute for Public Policy Research, November 2003.
- Miller, Ronald E., and Peter D. Blair. [Input-Output Analysis: Foundations and Extensions.](#) Englewood Cliffs, NJ: Prentice Hall Inc., 1985.
- Morisi, Teresa L. "[Recent Changes in the National Current Employment Statistics Survey.](#)" *Monthly Labor Review* (June 2003).

- Morissette, René and Anick Johnson. [*Are Good Jobs Disappearing in Canada?*](#) Analytical Studies Branch research paper series, no. 239. Ottawa: Statistics Canada, January 2005.
- Moyer, Brian C., Mark A. Planting, Paul V. Kern, and Abigail M. Kish. [*“Improved Annual Industry Accounts for 1998-2003: Integrated Annual Input-Output Accounts and Gross-Domestic-Product-by-Industry Accounts.”*](#) *Survey of Current Business* (June 2004): 21-57.
- National Academy of Public Administration. [*Concept Paper for Off-Shoring Study*](#). December 2004.
- _____. [*Final Off-Shoring Proposal*](#). January 2005.
- National Bureau of Economic Research. [*“Business Cycle Expansions and Contractions.”*](#) <http://www.nber.org/cycles.html> (accessed May 2, 2005).
- National Bureau of Statistics of China. [*“Progress Report from National Bureau of Statistics of China.”*](#) Presented at Voorburg 18th Meeting, October 18, 2003.
- National Science Foundation. [*Next Generation Cybertools*](#). NSF Funding Opportunity Document. Arlington, Virginia: National Science Foundation, May 2005.
- _____. [*Summary of SBE/CISE Workshop on “Cyberinfrastructure for the Social and Behavioral Sciences.”*](#) Arlington, Virginia: National Science Foundation, March 15-16, 2005.
- neoIT. [*“Research Summary: Global ITO and BPO Trends in 2005.”*](#) *Offshore Insights Market Report Series 2* (12) (December 2004).
- _____. [*“Research Summary: Offshore and Nearshore ITO Salary Report 2004.”*](#) *Offshore Insights Market Report Series 3* (5) (May 2005).
- _____. [*“Research Summary: Mapping Offshore Markets Update 2004.”*](#) *Offshore Insights White Paper 2* (6) (June 2004).
- Norwood, Janet L. [*The Changing World of Employment: Factory Jobs, Productivity, and Worker Quality*](#). Washington, D.C.: Committee on National Statistics, October 2004.
- [*“A Note on Patterns of Production and Employment by U.S. Multinational Companies.”*](#) *Survey of Current Business* (March 2004).
- Novak, Christopher A. and Matthew F. Kazmierczak. [*Offshore Outsourcing in an Increasingly Competitive and Rapidly Changing World: A High-Tech Perspective*](#). Washington, D.C.: American Electronics Association, March 2004.

- Okolie, Cordelia. [“Why Size Class Methodology Matters in Analyses of Net and Gross Job Flows.”](#) *Monthly Labor Review* (July 2004).
- O’Neill, Vin. [“IEEE-USA Perspectives on the Adequacy of Available Data on Off-Shore Outsourcing.”](#) Presented at National Academy of Public Administration, Washington, D.C., May 2005.
- Organisation for Economic Co-operation and Development. [“Chapter 2: Globalisation of the ICT Sector: Section on International Sourcing.”](#) In *Information Technology Outlook 2004*. Paris: OECD, forthcoming.
- _____. [“OECD Workshop on Services.”](#) Conference Materials. Paris, November 15-16, 2004.
- _____. [“Trade-Adjustment Costs in OECD Labour Markets: Three Annexes.”](#) Annexes to Chapter 1 of the *OECD Employment Outlook 2005*. Paris: OECD, 2005.
- Organisation for Economic Co-operation and Development, Economics Department. [*The Benefits of Liberalising Product Markets and Reducing Barriers to International Trade and Investment: The Case of the United States and the European Union.*](#) Working Paper no. 432. Paris: OECD, May 2005.
- Organisation for Economic Co-operation and Development, Trade Union Advisory Committee. [*Trade, Offshoring of Jobs and Structural Adjustment: The Need for a Policy Response.*](#) TUAC discussion paper. Paris: OECD, 2004.
- Orlov, Laurie M. and John C. McCarthy. [*IT Is Not Going Away—But The Worker Profile Changes: More Business-Centric White-Collar Roles Replacing Blue-Collar Technical Jobs.*](#) Cambridge, MA: Forrester Research, Inc., 2005.
- Pain, Nigel and Desirée van Welsum. [*International Production Relocation and Exports of Services.*](#) Paris: OECD, 2004.
- [“Panel Session on ICT-Enabled Services Offshoring: Country and Business Perspectives.”](#) Summary, meeting of the OECD Working Party on the Information Economy, June 2005.
- Parker, Andrew. [*Two-Speed Europe: Why 1 Million Jobs Will Move Offshore.*](#) Cambridge, MA: Forrester Research, Inc., 2004.
- Pinkston, Joshua C. and James R. Spletzer. [*Annual Measures of Job Creation and Job Destruction Created from Quarterly ES-202 Microdata.*](#) Washington, D.C.: U.S. Bureau of Labor Statistics, undated.
- Pivetz, Timothy R., Michael Searson, and James R. Spletzer. [“Measuring Job and Establishment Flows with BLS Longitudinal Microdata.”](#) *Monthly Labor Review* (April 2001):13-20.

- PricewaterhouseCoopers. [*Management Barometer Survey on Outsourcing of Financial Functions: U.S. Findings.*](#) PricewaterhouseCoopers, 2004.
- “[Progress Report – Bureau of the Census/Bureau of Labor Statistics.](#)” Presented at Voorburg Group, 18th Meeting, Tokyo, Japan, October 2003.
- Quinn, James Brian and Frederick G. Hilmer. “[Strategic Outsourcing.](#)” *The McKinsey Quarterly* 1 (1995).
- Randolph, William. [Comments on Slaughter presentation](#) “Expansion Abroad and the Domestic Operations of U.S. Multinational Firms.” AEI Conference on *Domestic Effects of Foreign Direct Investment*, December 2, 2004.
- République Française, Département des Activités tertiaires [French Republic, Department of the Tertiary Sector]. “[2003 Progress Report for France.](#)” Presented at 18th Voorburg Group Meeting on Service Statistics, Paris, September 9, 2003.
- Robinson, Marcia. [Interview with Journal of Business Strategy.](#) November 2004.
- Rosenthal, Beth Ellyn. [Deloitte Study Discovers 75 Percent of Global Financial Institutions Plan to Outsource Offshore.](#) June 2003.
- Samuelson, Paul A. “[Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization.](#)” *The Journal of Economic Perspectives* 18 (3) (Summer 2004): 135-146.
- Saunders, Norman C. [Coding Occupations for Risk of Offshore Outsourcing.](#) Washington, D.C.: Bureau of Labor Statistics, undated.
- Sayed, Asad and Radhika Balakrishnan. “[Why Do Firms Disintegrate? Towards an Understanding of the Firm-Level Decision to Subcontract and its Implications for Labor.](#)” In *Labor and the Globalization of Production: Causes and Consequences of Industrial Upgrading*. New York: Palgrave Macmillan, 2005.
- Schultze, Charles L. “[Offshoring, Import Competition, and the Jobless Recovery.](#)” *The Brookings Institution Policy Brief #136* (August 2004).
- Scott, Robert E. [The High-Price of ‘Free’ Trade: NAFTA’s Failure Has Cost the United States Jobs Across the Nation.](#) Economic Policy Institute briefing paper. Washington, D.C.: EPI, November 2003.
- _____. [U.S.-China Trade, 1989-2003: Impact on Jobs and Industries, National and State-by-State.](#) Economic Policy Institute Working Paper #270. Washington, D.C.: EPI, January 2005.

[“Services Offshoring: What do the Data Tell Us?”](#) Workshop hosted by The Brookings Institution, June 22, 2004.

[Shared Services News](#) 6 (10) (February 2005).

Slaughter, Matthew J. [“Does the Tax System Create Excessive Incentives to Move Economic Activity Abroad?”](#) ITPF/AEI Seminar on Domestic Effects of Foreign Direct Investment, Washington, D.C., December 2, 2004.

_____. [“Expansion Abroad and the Domestic Operations of U.S. Multinational Firms.”](#) ITPF/AEI Seminar on Domestic Effects of Foreign Direct Investment, Washington, D.C., December 2, 2004.

_____. [Globalization and Employment by U.S. Multinationals: A Framework and Facts.](#) March 2004.

Solomon, Jay. [“Offshoring of Jobs to Widen in 2005: Study Says Growth Helped By Less Political Opposition, More Pressure to Cut Costs.”](#) *The Wall Street Journal Online* (2004).

Spletzer, James R., et al. [“Business Employment Dynamics: New Data on Gross Job Gains and Losses.”](#) *Monthly Labor Review* (April 2004): 29-42.

Srinivasan, T.N. [“Information Technology Enabled Services and India’s Growth Prospects.”](#) Presented at the Brookings Forum, Offshoring White-Collar Work: The Issues and Implications, May 12-13, 2005.

Statistics Canada. [Occupation: 2001 Census Technical Report.](#) Cat. No. 92-388-XIE.

Statistics Sweden. [“Progress Report of Sweden.”](#) Presented at 18th Meeting of the Voorburg Group, Tokyo, Japan, October 2003.

Tanaka, Nobuo. [“Main Messages from the OECD Services Project and its Background.”](#) Presented April 20, 2005.

[Title V—Confidential Information Protection and Statistical Efficiency.](#) Pub. L. 107–347, 17 Dec. 2002, 116 Stat 2962.

Trefler, Daniel. [“Offshoring: Threats and Opportunities.”](#) Prepared for the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and Implications, May 12-13, 2005.

Triplett, Jack E. and Barry P. Bosworth. [“Productivity Measurement Issues in Service Industries: ‘Baumol’s Disease’ Has Been Cured.”](#) *FRB NY Economic Policy Review* (September 2003): 23-33.

- United Nations, et al. [Manual on Statistics of International Trade in Services](#). Geneva: United Nations, 2002.
- U.S. Bureau of Economic Analysis. [U.S. Bureau of Economic Analysis Strategic Plan for FY 2005-FY 2009](#).
- U.S. Bureau of Labor Statistics. [“Cooperating State Agencies: Occupational Employment and Statistics \(OES\) Program.”](#)
- U.S. Bureau of Labor Statistics and U.S. Census Bureau. [Current Population Survey: Design and Methodology](#). Technical Paper 63RV. Washington, D.C.: BLS, March 2002.
- U.S. Census Bureau, Bureau of Economic Analysis and National Science Foundation, Division of Science Resources Statistics. [Research and Data Development Link Project Final Report](#). Washington, D.C.: U.S. Census Bureau, June 2005.
- U.S. Chamber of Commerce. [Jobs, Trade, Sourcing, and the Future of the American Workforce](#). Washington, D.C.: U.S. Chamber of Commerce, April 2004.
- U.S. China Economic and Security Review Commission. [2004 Report to Congress](#). 108th Congress, 2nd Session. Washington, D.C.: June 2004.
- U.S. Department of Commerce. [Manufacturing in America: A Comprehensive Strategy to Address the Challenges to U.S. Manufacturers](#). Washington, D.C.: U.S. Department of Commerce, January 2004.
- U.S. Department of Labor. [“Business Employment Dynamics: Second Quarter 2004.”](#) *Bureau of Labor Statistics News* (February 15, 2005) USDL 05-207.
- _____. [“Employment Situation: May 2005.”](#) *Bureau of Labor Statistics News* (3 June 2005) USDL 05-965.
- _____. [“Extended Mass Layoffs Associated With Domestic and Overseas Relocations, First Quarter 2004.”](#) *Bureau of Labor Statistics News* (June 10, 2004) USDL 04-1038.
- _____. [Extended Mass Layoffs in 2003](#). Report 982. Washington, D.C.: U.S. Department of Labor, December 2004.
- _____. [“Extended Mass Layoffs in the Fourth Quarter of 2004 and Annual Averages for 2004.”](#) *Bureau of Labor Statistics News* (February 16, 2005) USDL 05-264.
- _____. [“Job Openings and Labor Turnover: February 2005.”](#) *Bureau of Labor Statistics News* (April 12, 2005) USDL 05-622.
- _____. [“Mass Layoffs in February 2005.”](#) *Bureau of Labor Statistics News* (March 24, 2005) USDL 05-486.

- _____. [“Occupational Employment and Wages, November 2003.”](#) *Bureau of Labor Statistics News* (November 12, 2004) USDL 04-2320.
- _____. [Occupational Employment and Wages, May 2003.](#) Bulletin 2567. Washington, D.C.: Bureau of Labor Statistics, September 2004.
- _____. [“Worker Displacement, 2001-03.”](#) *Bureau of Labor Statistics News* (30 July 2004) USDL 04-1381.
- U.S. Government Accountability Office. [International Trade: Current Government Data Provide Limited Insight into Offshoring of Services.](#) Report to Congressional Requesters GAO-04-932. Washington, D.C.: GAO, September 2004.
- U.S. Government Accountability Office. [International Trade: U.S. and India Data on Offshoring Show Significant Differences.](#) GAO-06-116. Washington, D.C.: GAO, October 2005.
- U.S. International Trade Commission. [Examination of U.S. Inbound and Outbound Direct Investment.](#) Publication 3383. Washington, D.C.: U.S. International Trade Commission, January 2001.
- _____. [Industry Trade and Technology Review.](#) Publication 3253. Washington, D.C.: U.S. International Trade Commission, October 1999.
- _____. [Industry Trade and Technology Review.](#) Publication 3661. Washington, D.C.: U.S. International Trade Commission, November 2003.
- _____. [Recent Trends in U.S. Services Trade: 2004 Annual Report.](#) Publication 3703. Washington, D.C.: International Trade Commission, June 2004.
- Van Welsum, Desirée. [In Search of ‘Off Shoring’: Evidence from U.S. Imports of Services.](#) London: Birkbeck University of London, 2004.
- _____. [“International Services Sourcing: Opportunities and Challenges.”](#) Presented at European e-Skills Conference 2004, Thessalonica, Greece, September 20-21, 2004.
- Van Welsum, Desirée and Xavier Reif. [“Potential Offshoring: Evidence from Selected OECD Countries.”](#) Presented at the Brookings Trade Forum 2005: Offshoring White-Collar Work—The Issues and Implications, May 12-13, 2005.
- Van Welsum, Desirée and Graham Vickery. [Potential Offshoring of ICT-Intensive Using Occupations.](#) Paris: Organisation for Economic Co-operation and Development, 2005.
- Vargo, Franklin J. [“NAFTA: A Ten-Year Perspective and Implications for the Future.”](#) Testimony before the Subcommittee on International Economic Policy, Export, and

- Trade Promotion, Committee on Foreign Relations, United States, Senate, April 20, 2004.
- Venkatraman, N. Venkat. [“Offshoring Without Guilt.”](#) *MIT Sloan Management Review* 45 (3) (Spring 2004): 14-16.
- Ventoro. [Offshore 2005 Research: Preliminary Findings and Conclusions.](#) Hillsboro, OR: Ventoro, October 2004.
- “Voorburg 2003: [Progress Report from the UK.](#)” Presented at 18th Meeting of the Voorburg Group, Tokyo, Japan, October 2003.
- Wessel, David. [“In Spite of Offshoring, U.S. Students Can Still Engineer a Career.”](#) *The Wall Street Journal Online* (June 16, 2005).
- Whichard, Obie G. [“Measuring Globalization: The Experience of the United States of America.”](#) Prepared for the 22nd CEIES Seminar, Statistics and Economic Globalisation, Copenhagen, Denmark, June 2-3, 2003.
- _____. [“Multiple Indicators for Multiple Uses: United States Statistics on Foreign Direct Investment.”](#) Presented at OECD World Forum on Key Indicators, Palermo, Italy, November 10-13, 2004.
- Wölfel, Anita. [The Service Economy in OECD Countries.](#) Science, Technology and Industry. Working Paper 2005/3. Paris: Organisation for Economic Co-operation and Development, 2005.
- World Trade Organization. [Financial Services: Background Note by the Secretariat.](#) S/C/W/72 (98-4837). Geneva: WTO, December 1998.
- _____. [GATS—Fact and Fiction.](#) Geneva: WTO, 2001.
- _____. [Presence of Natural Persons \(Mode 4\): Background Note by the Secretariat.](#) S/C/W/75 (98-4927). Geneva: WTO, December 1998.
- Zagada Institute. [Caribbean Call Center Report 2002.](#) Zagada Markets, Inc., 2002.
- Zeile, William J. [“Operations of U.S. Affiliates of Foreign Companies: Preliminary Results from the 2002 Benchmark Survey.”](#) *Survey of Current Business* (August 2004): 192-217.

OVERVIEW OF EXISTING DATA TO ESTIMATE OFF-SHORING

A thorough evaluation of existing data sets must be based on a precise definition of off-shoring. In the absence of such a precise definition, an overview of existing economic and demographic data sets is still possible and useful.

To date, most definitions of off-shoring involve some form of job loss in the United States coupled with new job creation overseas. Although no data set allows us to adequately measure such activities (or to link them together), the following section provides an overview of existing data from key federal statistical agencies, including the U.S. Census Bureau, the Bureau of Labor Statistics, and the Bureau of Economic Analysis. Also included is a description of some of the major datasets available from international organizations such as the WTO, OECD, World Bank, and the International Monetary Fund.

Most of the data sets mentioned below have legislative mandates, and, therefore, it is unlikely that major changes will occur to their contents. Furthermore, changes to the content of existing data sets usually require testing prior to implementation of those changes, and such testing usually takes a considerable period of time.

Linkages between data sets are possible, but only when the proposed data are within the rather narrow scope of the Confidential Information Protection and Statistical Efficiency Act of 2002. The scope of this legislation currently precludes easily linking data sets (such as the Census Bureau's Business Register) that contain information from the Internal Revenue Service with data from the BLS and the BEA.

With those limitations on the use of existing data in mind, below is an overview of data currently collected by Census, BLS, and BEA.

U.S. Census Bureau, Department of Commerce

American Community Survey

- Purpose:** Nationwide survey designed to provide communities with current and accurate information every year about their demographic, socio-economic, and housing characteristics.
- Measures:** Basic economic data obtained from respondents include place of residence, place of work, labor-force status, employment status in the previous year, industry, occupation, class of worker, and income. Derived measures include median income and poverty rates.
- Geography:** Nation, state, geographies of 65,000 or more, geographies of 20,000-65,000 (three-year averages), census tract and block groups (five-year averages).
- Frequency:** Annually (most recently released data are from 2003).
- Method:** Surveys are mailed every month to a random sample of addresses in each county (nearly 250,000 per month). Telephone and in-person interviews are used to follow-up on nonrespondents.
- Access:** More information about the American Community Survey and data are available at <http://www.census.gov/acs/www/>.
- Key words:** Demographics, Employment and Unemployment (Labor Force Status by Place of Residence), Income.

Annual Survey of Manufactures

- Purpose:** To provide key intercensal measures of manufacturing activity, products, and location for the public and private sectors.
- Measures:** Employment, payroll, worker hours, payroll supplements, cost of materials, valued added by manufacturing, capital expenditures, inventories, and energy consumption. Provide estimates of value of shipments for more than 1,800 classes of manufactured products.
- Geography:** Nation and states.
- Frequency:** Annually (except in years ending in “2” and “7” when Annual Survey of Manufactures data are included in the manufacturing sector of the Economic Census).
- Method:** Mail survey of 55,000 manufacturing establishments (25,000 large establishments are selected with certainty; 30,000 other establishments are selected with probability proportional to a composite measure of establishment size). Survey is updated from two sources: Internal Revenue Service administrative records are used to include new single-unit manufacturers and the Company Organization Survey identifies new establishments of multi-unit firms.
- Access:** More information about the Annual Survey of Manufactures and data are available at <http://www.census.gov/econ/overview/ma0300.html>.
- Key words:** Inputs and Outputs.

Business Register

- Purpose:** To provide a current and comprehensive database of U.S. business establishments and companies for statistical program use.
- Measures:** Data are establishment-based and include business location, organization type (e.g., subsidiary or parent), industry classification, and operating data (e.g., receipts and employment). Data are maintained separately for each establishment, company, and major intracompany organizational unit.
- Geography:** Nation, state, and county.
- Frequency:** Business Register listings are initiated and updated continuously with the latest and best information available from the Census Bureau and other federal statistical and administrative records program.
- Method:** Updated through a database with multiple tables to consolidate and link administrative, Census, and survey data. List information for single establishments and EINs is updated continuously, including employment and payroll data based on payroll tax records and receipts data based on income tax records from the Internal Revenue Service. Information for establishments of multi-unit companies is updated annually based on responses to the Company Organization Survey and Annual Survey of Manufactures. Other routine sources of update information include Census Bureau current surveys (e.g., Current Industrial Reports) and the economic census.
- Access:** More information about the Business Register is available at <http://www.census.gov/econ/overview/mu0600.html>.

Census of Manufactures

- Purpose:** To provide periodic and comprehensive statistics about manufacturing establishments, activities, and production.
- Measures:** Basic data obtained for all establishments include kind of business, geographic location, type of ownership, total revenue, annual and first quarter payroll, and employees in the pay period including March 12. Establishments receiving a long form provide added detail and added data (including inventories, capital expenditures, identification of some 1,000 materials consumed, cost of materials, energy consumed, and quantity and value of shipments for some 11,000 products).
- Geography:** Nation, state, metropolitan area, and selected counties and places.
- Frequency:** Every five years for years ending in “2” and “7”.
- Method:** Mail-out/mail-back census of 237,000 establishments of all multi-unit firms and single-unit firms with payrolls above a cutoff size plus administrative data for all 143,000 nonmail single establishments. For single-unit firms below the cutoff size (those not receiving a census form), basic data are obtained from federal income tax records and additional data items are estimated using industry averages.
- Access:** More information about the Census of Manufactures is available at <http://www.census.gov/econ/overview/ma0100.html>.
- Key words:** Inputs and Outputs.

County Business Patterns

- Purpose:** To provide annual detailed geographic, industry, and other information for U.S. business establishments.
- Measures:** Data consist of the number of establishments, first quarter and annual payroll, and employment during the week of March 12. Data for establishments are presented by geographic area, six-digit NAICS, and employment size class.
- Geography:** Nation, state, county.
- Frequency:** Annually.
- Method:** Data are extracted from the Census Bureau's Business Register—the file of all known single and multiestablishment companies. The data on multi-location firms comes from the Annual Company Organization Survey and quinquennial Economic Censuses. Data on single-location firms are obtained from various programs such as the Economic Censuses, the Annual Survey of Manufactures, Current Business Surveys, and administrative records of the Internal Revenue Service, the Social Security Administration, and the Bureau of Labor Statistics.
- Access:** More information about County Business Patterns is available at <http://www.census.gov/econ/overview/mu0800.html>. Data from County Business Patterns are available at <http://www.census.gov/epcd/cbp/view/cbpview.html>.
- Key words:** Employment and Unemployment (Employment by Place of Work), Employment Earnings.

Decennial Census of Population and Housing

- Purpose:** Decennial census is used to apportion representation among states for the House of Representatives. In addition, these data are used to distribute annual federal funding, draw state legislative districts, evaluate the success of programs, and identify populations in need of services.
- Measures:** Basic economic data obtained from respondents include place of residence, place of work, labor-force status, work status last year, industry, occupation, class of worker, and income. Derived measures include median income and poverty rates.
- Geography:** Nation, state, county, census tract, block group, and block (as well as others).
- Frequency:** Every 10 years (most recently released data are from 2000).
- Method:** Mail survey with telephone and personal interview follow ups. Approximately one of six households in the country is surveyed.
- Access:** More information about Census 2000 and data are available at <http://www.census.gov/main/www/cen2000.html>.
- Key words:** Demographics, Employment and Unemployment (Labor Force Status by Place of Residence), Income.

Economic Census

- Purpose:** To provide periodic and comprehensive statistics about business establishments and activities.
- Measures:** Basic data obtained for all establishments include kind of business, geographic location, type of ownership, total revenue, annual and first quarter payroll, and employees in a pay period including March 12.
- Geography:** Nation, state, metropolitan area, county, city, place, zip code.
- Frequency:** Every five years (years ending in “2” and “7”; most recently in 2002).
- Method:** Mail-out/mail-back data collection for establishments of multi-unit companies, large single-unit employers, and a sample of small employers. Also included are administrative records data for nonselected small employers and all non-employers.
- Access:** More information about the Economic Census is available at <http://www.census.gov/econ/overview/ma0300.html>. Data from the 2002 Economic Census are available at <http://www.census.gov/econ/census02/>.
- Uses of data:** BEA uses these data to benchmark GDP estimates and prepare input-output tables. BLS uses these data to benchmark producer price indexes and prepare productivity statistics.
- Key words:** Inputs and Outputs.

Export Statistics

- Purpose:** To provide detailed statistics on goods and estimates of services shipped from the United States to foreign countries. Assistance provided by the Department of Homeland Security. Measures: Data are compiled in terms of commodity classification, quantity, value, state of (movement) origin, customs district, country of destination, method of transportation, and whether contents are domestic goods or re-exports.
- Geography:** Nation.
- Frequency:** Monthly.
- Method:** Full compilation (i.e., census) of commodity exports, plus Census Bureau estimates of low-value exports and BEA estimates of trade in services. Statistics for exported goods transactions are compiled from three sources: Shipper’s Export Declaration documents filed with Customs and sent to the Census Bureau, comparable data in electronic form submitted directly by large exporters, and special computer tapes from Canada for U.S. exports to Canada. Estimates are made for low-value exports by the country of destination and based on bilateral trade patterns.
- Access:** More information about Export Statistics is available at: <http://www.census.gov/econ/overview/mt0200.html>

Exporter Database

Purpose:	To provide a periodic database of all U.S. exporters and their characteristics.
Measures:	Export data include commodities exported; shipment value, weight, country of destination, U.S. customs port, and method of transportation; exporter ZIP Code; and whether the transaction was between plants of the same firm. Business Register data include exporter identification, location and employment, and parent company identification, organization, location, employment, number of establishments and ownership. Census data are from the Census of Manufactures and Census of Wholesale Trade, are establishment based, and include identification, total shipments, total export shipments (or sales), and employment.
Geography:	Nation.
Frequency:	Annually.
Method:	Data are from a compilation of selected establishment- and company-level data from annual export, the latest Business Register, and selected five-year economic census files. Data are obtained and linked for all firms and establishments that file information through the electronic Automated Export System or via paper on the Shipper's Export Declaration for commodities shipped. Data from different transactions and files are linked through use of reported EIN, and other census file identification information. Linkages for single-unit (location) establishments are more exact than linkages for different units within multiestablishment companies.
Access:	More information about the Exporter Database is available at: http://www.census.gov/econ/overview/mt0300.html

Import Statistics

Purpose:	To provide detailed statistics on goods and estimates of services entering the United States from foreign countries. Assistance provided by U.S. Customs and Border Protection and the BEA.
Measures:	Data are compiled in terms of commodity classification, quantity, value, country of origin, customs district, method of transportation, shipping weight, and import charges and duties.
Geography:	Nation.
Frequency:	Data are continually compiled and processed. Documents are collected as shipments arrive and processed on a flow basis. Reports summarize shipments made during calendar months and years. Statistics for imports by commodity, quantity, value, country of origin, etc., are reported on a monthly and year-to-date basis.
Method:	Full compilation (i.e., census) is taken of import shipments, plus Census Bureau estimates of low-value imports and Bureau of Economic Analysis estimates of trade in services. Statistics for imported goods shipments are compiled from records filed with Customs within 10 days after the merchandise enters the United States. Estimates are made for low-value shipments by country of origin, based on previous bilateral trade patterns, and are periodically updated.

Access: More information about Import Statistics and data are available at <http://www.census.gov/econ/overview/mt0100.html>.

Service Annual Survey

Purpose: To provide estimates of revenue and other measures for most traditional service industries.

Measures: Operating revenue for both taxable and tax-exempt firms and organizations, sources of revenue and expenses by type for selected industries, and operating expenses for tax-exempt firms; and selected industry-specific items. For recent years, e-commerce data are collected for all industries, and export and inventory data are collected for selected industries.

Geography: Nation.

Frequency: Annually (with a new sample introduced every five years).

Method: Mail-out/mail-back survey of approximately 50,000 selected service businesses with paid employees, which is supplemented by administrative records or imputed values to account for nonemployer and certain other businesses. To be eligible, service businesses must be in the Business Register, which contains all EINs for listed businesses and all locations of multiestablishment companies. Large companies are included in the survey and report for all of their service industry locations. Smaller companies are stratified by major kind of business and receipts or revenue. Within each of these strata, a simple random sample of EINs is selected. The initial sample is updated quarterly to reflect births and deaths of businesses and establishments. Data collection begins in January and continues for about 14 weeks.

Access: More information about the Service Annual Survey is available at <http://www.census.gov/econ/overview/sas0500.html>.

Quarterly Workforce Indicators (QWI)

Purpose: To provide a set of employment and earnings measures for participating states on a quarterly basis and at a fine level of demographic, geographic, and industry detail.

Measures: Thirty employment, employment flow, and earnings measures are produced. The nine currently available online are Total Employment, Net Job Flows, Job Creation, New Hires, Separations, Turnover, Average Monthly Earnings, Average Monthly Earnings for New Hires. An additional 21 public-use measures, available by special request, are also produced. Measures are reported by sex, age group, ownership code by county, metropolitan area, and Workforce Investment Area and by two-, three-, and four-digit NAICS (2001–onward) and standard industrial classification.

Geography: State (currently 29 participating in the program), metropolitan area, county, and Workforce Investment Area.

- Frequency: Quarterly (the most recent quarter reported at a four quarter lag, e.g., in 2005Q3 the most recent measures available are 2004Q3).
- Method: The QWI are derived from the integration of a variety of administrative data sources, primarily state unemployment insurance (UI) wage records, state ES-202 establishment-level microdata, and the Census NUMIDENT file. Employment and earnings measures are tabulated at both the individual and establishment level and then aggregated to the levels of geography and industry approved for publication. For each state, the QWI for the entire date range is revised with each quarterly update. Technical details are available at <http://lehd.dsd.census.gov/led/library/techpapers/tp-2002-05-rev1.pdf>.
- Access: More information about the Quarterly Workforce Indicators is available at <http://lehd.dsd.census.gov>.

Bureau of Labor Statistics, Department of Labor

Business Employment Dynamics

- Purpose: To measure the net change in employment at the establishment level (difference between gross job gains and gross job losses).
- Measures: Number and percent of gross jobs gained by opening and expanding establishments, number and percent of gross jobs losses by closing and contracting establishments, and number and percent of establishments that are classified as openings, closings, expansions, and contractions.
- Geography: Nation.
- Frequency: Quarterly.
- Method: Data to construct gross job gains and gross job losses statistics come from the QCEW (formerly called the ES-202) program, and, therefore, include all establishments subject to state UI laws and the Unemployment Compensation for Federal Employees program. Establishments report employment for the pay period including the 12th of the month. The job flow estimates report employment changes between the third months of each quarter.
- Access: More information about the Business Employment Dynamics program is available at <http://www.bls.gov/bdm/home.htm>.

Current Employment Statistics, Nonfarm Payroll Statistics

- Purpose: To provide monthly national data by detailed industry on employment, hours, and earnings of workers on the payrolls of nonfarm establishments.
- Measures: Total employment, number of women employed, number of production or nonsupervisory workers, average hourly earnings, average weekly hours, average weekly earnings, and average weekly overtime hours in manufacturing industries.
- Geography: Nation, state, and most major metropolitan areas.
- Frequency: Monthly (with annual averages).

- Method:** Survey based on a sample of payroll records for more than 400,000 business establishments for the pay period including the 12th of the month. Survey is conducted by State Employment Security Agencies in cooperation with the BLS (federal-state cooperative program). Survey is conducted of a sample of establishments (primarily through electronic means) and supplemented by mail and fax responses.
- Access:** More information about the Current Employment Statistics program is available at <http://www.bls.gov/ces/home.htm>.
- Key words:** Employment and Unemployment (Employment by Place of Work), Employment Earnings.

Current Population Survey (CPS), Labor Force Statistics

- Purpose:** To provide a comprehensive body of information on the employment, unemployment, earnings, and other labor-market topics classified by age, sex, race, and a variety of other characteristics.
- Measures:** Employment status of the civilian noninstitutional population; employed persons by occupation, industry, class of worker, hours of work, full- or part-time status; employed multiple jobholders by occupation, industry, number of jobs held, and full- or part-time status of multiple jobs; unemployed persons by occupation, industry, class of worker of last job, duration of unemployment, reason for unemployment, and methods used to find employment; discouraged workers and other people not in the labor force; data on work experience, occupational mobility, job tenure, educational attainment, and school enrollment of workers; and information on weekly and hourly earnings by detailed demographic group, occupation, education, union affiliation, and full- and part-time employment status.
- Geography:** Nation.
- Frequency:** Monthly (basic labor force data) with data on special topics collected in periodic supplements.
- Method:** Sample of about 60,000 households, with data being collected through personal and telephone interviews.
- Access:** More information about the CPS is available at: <http://www.bls.gov/cps/home.htm>
- Key words:** Employment and Unemployment, Income.

Displaced Workers Supplement to the Current Population Survey , Labor Force Statistics

- Purpose:** To provide more detailed information on worker displacement for those workers in the CPS experiencing displacement events.
- Measures:** Data are provided on reasons for job displacement, industry and occupation of the former job, group health insurance coverage, job tenure, and weekly earnings. Additional data refer to periods of unemployment as well as number of jobs held,

use of unemployment benefits, whether residence was changed to seek work in another area, current health insurance coverage, and current weekly earnings.

- Geography: Nation.
 Frequency: Every two years (February supplement).
 Method: The displaced worker supplemental questions are asked in February in years ending in an even number to those CPS individuals over the age of 20 who experienced an involuntary job loss within the previous five years due to operating decisions of a firm, plant, or business in which the worker was employed. Displaced workers data are a subset of the CPS sample of about 60,000 households, the size of which depends on the incidence rate of displacement events within CPS sampled individuals.
 Access: More information about the CPS is available at <http://www.bls.census.gov/cps/>.
 Key words: Employment and Unemployment, Income.

Foreign Labor Statistics

- Purpose: To provide comparative information on the competitive position of the United States in foreign trade.
 Measures: Productivity (output per hour) and unit labor costs (labor compensation per unit of output); hourly compensation costs of manufacturing production workers; the labor force, employment, and unemployment; gross domestic product per capita and per employed person; and consumer prices and other measures.
 Geography: Nation.
 Frequency: Annually.
 Method: Comparative statistics are based on data from statistical agencies of foreign countries and from international statistical organizations such as the United Nations, the OECD, the ILO, and Eurostat. All data are drawn from existing data sources; the Bureau of Labor Statistics does not initiate surveys or data collection programs abroad.
 Access: More information about Foreign Labor Statistics is available at <http://www.bls.gov/fls/home.htm>.

International Price Program, Import/Export Price Indexes

- Purpose: To provide monthly data on the change in the price of imported and exported nonmilitary goods traded between the United States and the rest of the world.
 Measures: Price indexes for nearly all merchandise categories, selected categories of international services, and monthly indexes by locality of origin
 Geography: Nation.
 Frequency: Monthly.
 Method: Sample of U.S. exporters is derived from shippers' export declarations; sample of U.S. importers is derived from consumption entry documents. Price data are collected by mail questionnaire—after interviews with reporting companies—on about 10,000 individual export items and 12,000 import items.

Access: More information about the International Price Program is available at <http://www.bls.gov/mxp/>.

Job Openings and Labor Turnover Survey

Purpose: To provide monthly data on job openings, hires, and separations.
 Measures: Demand-side indicators of labor shortages at the national level: total employment, job openings, hires, quits, layoffs, and other separations.
 Geography: Nation.
 Frequency: Monthly.
 Method: Data from a sample of approximately 16,000 U.S. business establishments are collected by the BLS, covering all nonagricultural industries in the public and private sectors.
 Access: More information about the Job Openings and Labor Turnover Survey is available at <http://www.bls.gov/jlt/home.htm>.

Local Area Unemployment Statistics, Geographic Profile of Employment and Unemployment

Purpose: To provide data on the employed and unemployed by selected demographic and economic characteristics.
 Measures: Civilian noninstitutional population, labor-force participation rate, and employment status by demographic information, occupation, industry, and hours worked.
 Geography: Nation, state, 50 large metropolitan areas, and 17 central cities.
 Frequency: Annually.
 Method: Derived from monthly CPS data.
 Access: More information about the Geographic Profile of Employment and Unemployment is available at <http://www.bls.gov/gps/home.htm>.
 Key words: Employment and Unemployment (Labor Force Status by Place of Residence).

Local Area Unemployment Statistics, Monthly Labor Force Estimates

Purpose: To serve as a key indicator of local economic conditions, by producing monthly and annual employment, unemployment, and labor force data for Census regions and divisions, states, counties, metropolitan areas, and many cities (based on place of residence).
 Measures: Employment, unemployment, labor force, and unemployment rate.
 Geography: Nation, state, county, and selected cities.
 Frequency: Monthly (with annual calendar year averages).
 Method: State monthly model estimates are controlled to sum to the national monthly labor-force estimates from the CPS. State models combine data from the CPS, the Current Employment Statistics program, and the state UI systems.

Access: More information about the Local Area Unemployment Statistics program is available at <http://www.bls.gov/lau/home.htm>.

Key words: Employment and Unemployment (Labor Force Status by Place of Residence).

Mass Layoff Statistics

Purpose: To provide reports on mass layoff actions that resulted in workers being separated from their jobs. It uses a standardized, automated approach to identify, describe, and track the effects of major job cutbacks, using data from each state's UI database.

Measures: For establishments with at least 50 initial claims for UI filed against them during a consecutive five-week period, information is obtained on the total number of persons separated, the reasons for separation; worksite closures, recall expectations, and socioeconomic characteristics on UI claimants such as sex, age, race, and residency.

Geography: Nation, state.

Frequency: Annually, quarterly, and monthly. Monthly news release includes summary information for states by industry. Quarterly news release includes nature of private-sector nonfarm layoffs lasting more than 30 days for states as well as the claimant characteristics associated with those layoffs. Annual report provides detailed nature of layoffs and associated claimant characteristics lasting more than 30 days for the nation, plus layoff activity for each state.

Method: Federal-state cooperative effort where monthly data are based on administrative records of UI filings and establishment classifications. Quarterly data are based on administrative data supplemented with employer confirmation of layoffs and plant closings and additional employer-provided data. Characteristics of claimants are collected at two points in time: when an initial file is made and when the claimant exhausts regular UI benefits. Inbetween these points, the unemployment status of claimants is tracked through the monitoring of certificates for unemployment (continued claims) filed under the regular state UI program.

Access: More information about the Mass Layoff Statistics program is available at <http://www.bls.gov/mls/home.htm>.

National Compensation Survey

Purpose: Designed to integrate data from separate BLS compensation surveys, specifically, data on occupational earnings, compensation cost trends, and benefit incidence.

Measures: Local, regional, and national occupational earnings; quarterly changes in employer costs through the Employment Cost Index; annual employer cost levels through the Employer Costs for Employee Compensation; and incidence and provisions of employee benefits. Precise measures include average hourly wages by industry, occupational group, full-time and part-time status, union and nonunion status, establishment size, time and incentive status, and job level;

weekly and annual earnings and hours for full-time workers; and earnings by work level that permit wage comparisons across occupational groups;

Geography: Nation, state, and a sample of metropolitan and nonmetropolitan areas.

Frequency: Annually (30-35 large metropolitan areas are surveyed, smaller areas surveyed less frequently).

Method: Data collected through a survey of 36,000 establishments nationwide.

Access: More information about the National Compensation Survey is available at <http://www.bls.gov/ncs/home.htm>.

Key words: Employment Earnings.

Occupational Employment Statistics

Purpose: To produce estimates on employment and wages for more than 750 occupations and 400 nonfarm industries, plus occupational data by geographic area.

Measures: Total employment by occupation, occupational employment by industry, wages by occupation, occupational wages by industry.

Geography: Nation, state, metropolitan area.

Frequency: Annually.

Method: Semiannual mail survey of nonfarm establishments, carried out as a federal-state cooperative effort between BLS and state workforce employment agencies, which collect data for the payroll period including the 12th day of May or November depending on the industry surveyed. Nearly 200,000 establishments are included per panel (every six months), taking three years to fully collect the sample of 1.2 million establishments.

Access: More information about the Occupational Employment Statistics program is available at <http://www.bls.gov/oes/home.htm>.

Key words: Employment Earnings

Quarterly Census of Employment and Wages Program

Purpose: To provide comprehensive employment and wage data by industry and geographic area for workers covered by state UI laws. The QCEW Program was known as the ES-202 Program prior to 2003.

Measures: Data on the number of establishments, monthly employment, and quarterly wages —by NAICS industry, county, and ownership sector—for the entire United States (for workers covered by state UI laws and federal workers covered by the Unemployment Compensation for Federal Employees program).

Geography: Nation, state, metropolitan area, labor-market area, and county.

Frequency: Annually, quarterly, monthly. Data are collected monthly and published quarterly; annual averages available.

Method: The QCEW program derives its data from quarterly tax reports submitted to State Employment Security Agencies by over eight million employers subject to state UI laws and from federal agencies subject to the Unemployment Compensation for Federal Employees program.

Access: More information about the QCEW program is available at <http://www.bls.gov/cew/home.htm>.

Key words: Employment and Unemployment (Employment by Place of Work), Employment Earnings.

Bureau of Economic Analysis, Department of Commerce

Balance of Payments (International Transactions)

Purpose: To provide a statistical summary of international transactions defined as the transfer of ownership of things of value: goods, services, income, financial claims, and liabilities.

Measures: Quarterly estimates of trade in goods, services, income, unilateral transfers, and financial assets.

Geography: Nation.

Frequency: Quarterly.

Method: Balance of payments estimates are based on the integration of a number of data sources, primarily Census Bureau merchandise trade statistics, BEA surveys, U.S. Treasury Department data on international capital movements, data from other U.S. government agencies, and other sources.

Access: General information about Balance of Payments is available at <http://www.bea.gov/bea/di/home/bop.htm>. Specific information about data sources and methodology is available in <http://www.bea.gov/bea/ARTICLES/INTERNAT/BPA/Meth/bopmp.pdf>.

Direct Investment, Foreign Direct Investment in the United States

Purpose: To provide summary estimates for MNCs in terms of employment, sales, capital expenditures, balance sheets, income statements, measures of R&D spending, and other financial and operating data.

Measures: International transactions and direct investment position data, financial and operating data of U.S. affiliates of foreign companies, and new investment data. Direct investment position and related balance of payments flows; operations of U.S. affiliates of foreign companies (financial and operating data such as balance sheets, income statements, employment and compensation of employees, trade in goods); establishment data from BEA-Census Link (links BEA enterprise, or company, data on foreign direct investment in the United States with the Census Bureau's establishment data for all U.S. companies—with data presented by detailed industry, by country of ultimate beneficial owner, and by state); U.S. business enterprises acquired or established by foreign direct investors; and benchmark surveys (operating and financial data of U.S. affiliates of foreign direct investors, such as balance sheets, income statement, external financing, employment and compensation of employees, and trade in goods).

Geography: Nation.

Frequency: Annually (some data are quarterly or less frequent).
 Method: Annual Survey of Foreign Direct Investment in the United States; Benchmark Survey of Foreign Direct Investment in the United States; Initial Investment Surveys; Quarterly Balance of Payments Surveys.
 Access: More information about Foreign Direct Investment in the United States is available at <http://www.bea.doc.gov/bea/di/home/directinv.htm>.

Direct Investment, U.S. Direct Investment Abroad

Purpose: To provide summary estimates for MNCs in terms of employment, sales, and capital expenditures, balance sheets, income statements, measures of R&D spending, and other financial and operating data.
 Measures: Direct investment position and related balance of payment flows (estimates of the U.S. direct investment position abroad, and of balance of payment flows between U.S. companies and their foreign affiliates, including capital flows (equity, intercompany debt, and reinvested earnings), income, and services); operations of U.S. parent companies and their foreign affiliates (operating and financial data such as balance sheets, income statements, employment and compensation of employees, trade in goods, and sales of goods and services); capital expenditures by majority-owned foreign affiliates of U.S. companies (discontinued in 1994); and benchmark surveys (operating and financial data such as balance sheets, income statements, external financing, employment and compensation of employees, trade in goods, and sales of goods and services).
 Geography: Nation.
 Frequency: Annually (some data are quarterly or less frequent).
 Method: Annual Survey of U.S. Direct Investment Abroad; Quarterly Balance of Payments Survey of U.S. Direct Investment Abroad; Benchmark Survey of U.S. Direct Investment Abroad.
 Access: More information about U.S. Direct Investment Abroad is available at <http://www.bea.gov/bea/di/home/directinv.htm>.

Gross State Product

Purpose: To provide a comprehensive measure of the overall economic activity of each state.
 Measures: Only domestic production.
 Geography: State.
 Frequency: Annually.
 Method: The sum of the factor incomes earned and the costs incurred in production. It includes adjustments for overseas activity that cannot be assigned to states (and GDP does not).
 Access: More information about the Gross State Product is available at <http://www.bea.gov/bea/regional/gsp.htm>.

International Investment Position

Purpose:	To provide estimates of U.S. claims on, and liabilities to, foreign residents.
Measures:	Annual estimates of the value of accumulated stocks of U.S.-owned assets abroad and of foreign-owned assets in the United States.
Geography:	Nation
Frequency:	Annually.
Method:	Estimates based primarily on reports filed under the Treasury International Capital Reporting System, BEA's Direct Investment Surveys and other U.S. government reports.
Access:	More information about the International Investment Position is available at: http://www.bea.gov/beatdi/home/iip.htm

International Services

Purpose:	To provide estimates of trade in services and of sales of services in international markets through U.S. and foreign affiliates of MNCs.
Measures:	Detailed data on cross-border services transactions and on sales of services by majority-owned foreign affiliates of U.S. companies and by majority-owned U.S. affiliates of foreign companies.
Geography:	Nation.
Frequency:	Annually for BEA's most detailed data by type of service and country. Less detailed data are available quarterly and monthly.
Method:	Data derived from a number of data sources, including BEA administered surveys.
Access:	More information about International Services is available at http://www.bea.gov/beatdi/home/more.htm . A detailed description of BEA service data sources and methodology may be found at http://www.bea.gov/beatdi/ARTICLES/2005/10October/1005_xborder.pdf

Regional Economic Information System, Employment Series

Purpose:	To provide local area earnings and employment information.
Measures:	Annual average employment by industry; total employment by industry for counties and metropolitan areas; annual place-of-work earnings by industry; state-level series by industry and metro and county all-industry series available for all workers and for wage and salary workers; metro and county series by industry only available for all workers.
Geography:	Nation, state, metropolitan area, and county.
Frequency:	Annually.
Method:	Data taken from a variety of sources including the QCEW Program (ES-202) and Internal Revenue Service data.

Access: More information about the Regional Economic Information System is available at <http://www.bea.gov/bea/regional/statelocal.htm>.

Key words: Employment and Unemployment (Employment by Place of Work)

Regional Economic Information System, Personal Income Series

Purpose: To provide local area personal income information.

Measures: Personal income by source, per capita income, and disposable per capita income.

Geography: Nation, state (all measures), and metropolitan area and county (personal income and per capita income).

Frequency: Annually.

Method: Data taken from a variety of sources including the QCEW Program (ES-202) and Internal Revenue Service data.

Access: More information about the Regional Economic Information System is available at <http://www.bea.gov/bea/regional/docs/cd.asp>.

Additional information provided at

<http://www.bea.gov/bea/regional/statelocal.htm>

Key words: Income, Employment Earnings

Regional Input-Output Modeling System

Purpose: To estimate the economic impacts of changes in a regional economy.

Measures: Output, earnings, and employment multipliers which can be used to trace the impacts of changes in final demand on directly and indirectly affected industries.

Geography: Nation and region.

Frequency: Irregular intervals (most current based on 1997 benchmark input-output accounts).

Method: Based on an accounting framework (input-output table). For each industry, an input-output table shows the industrial distribution of inputs purchased and outputs sold. Data are derived from two sources: BEA's national input-output table and BEA's regional economic accounts, which are used to adjust the national input-output table to show a region's industrial structure and trading pattern.

Access: More information about the Regional Input-Output Modeling System is available at <http://www.bea.gov/bea/regional/rims/>.

Trade in Goods and Services

Purpose: To provide monthly estimates of trade in goods and services.

Measures: Value of imports and exports for services (by major service category) and goods (by principal end-use category).

Geography: Nation.

Frequency: Monthly.

Method: Data are derived from a variety of survey and administrative data from both the BEA and other agencies and organizations. For example, Census basis goods data are compiled from the documents collected by the United States. Customs and Border Protection and reflect the movement of goods between foreign countries and the 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and U.S. Foreign Trade Zones. They include government and nongovernment shipments of goods and exclude shipments between the United States and its territories and possessions; transactions with U.S. military, diplomatic, and consular installations abroad; U.S. goods returned to the United States by its Armed Forces; personal and household effects of travelers; and in-transit shipments. Services estimates are based on quarterly, annual, and benchmark surveys and partial information generated from monthly reports. Service transactions are estimated at market prices. Estimates are seasonally adjusted when statistically significant seasonal patterns are present. No country or area detail is available due to the lack of adequate source data upon which to base estimates.

Access: More information about Trade in Goods and Services is available at <http://www.bea.gov/bea/di/home/trade.htm>.
And at <http://www.bea.gov/bea/newsrelarchive/2005/info0705.htm>.

Annual Industry Accounts

Purpose: To provide time series data on the changing structure of the U.S. economy.

Measures: Annual contributions of private industries and government to the Nation's Gross Domestic Product (GDP) and the annual flow of goods and services used in the production processes of industries and for final uses that comprise GDP.

Geography: Nation.

Frequency: Annually.

Method: Data are derived from a variety of sources including Census Bureau annual surveys, BLS price surveys, and Internal Revenue Service data.

Access: More information about the Annual Industry Accounts is available at: http://www.bea.gov/bea/dn2/home/annual_industry.htm.

Key words: GDP by industry, input-output accounts.

Internal Revenue Program, Statistics of Income Division (Department of the Treasury)

Income Tax Data

Purpose: To provide public use and restricted access aggregate- and microdata on individual earnings.

Measures: Adjusted gross income, taxable income (by source), deductions (by type), total exemptions, tax liability, and earned income tax credit.

Geography: Nation, state, and county.

Frequency: Annually.
 Method: Data are obtained from personal income tax returns. Both public use and restricted access data products are available.
 Access: Documentation of data products and services available at <http://www.irs.gov/pub/irs-soi/prodserv.pdf>.
 Key words: Income

U.S. Census Bureau Research Datasets

Longitudinal Business Database

Purpose: To examine entry and exit, gross job flows, and changes in the structure of the U.S. economy.
 Measures: Data set contains high-quality longitudinal establishment linkages, and several basic data items such as firm ownership, location, industry, payroll and employment. Data set can be used in conjunction with other Census Bureau surveys at the establishment and firm level.
 Geography: Nation, state, and county.
 Frequency: Annually.
 Method: Compiled by linking annual files from the Census Bureau's Business Register.
 Access: More information about this research dataset is available at <http://148.129.75.149/ces.php/data>.

Longitudinal Employer Household Dynamics (LEHD)-Business Register Bridge

Purpose: To provide a crosswalk to link data sets at various levels of business-unit aggregation for the purpose of research access through the Research Data Center network maintained by the Center for Economic Studies. The crosswalk is used to link LEHD establishment-level employer data to the Census Bureau's establishment and firm level micro data (e.g. Economic Censuses and surveys) on the basis of higher-level common business identifiers (e.g., federal EIN).
 Measures: Full list of establishments in the LEHD data that match to the Census Business Register on the basis of federal EIN. A finer match of establishments and business units within EIN are available at the four-digit industry, state, and county levels. Crosswalk also contains basic employment and sales data from the Business Register.
 Geography: N.A. Establishment- and firm-level identifiers (for over 20 states participating in the LED partnership).
 Frequency: Annually (1990-2004 depending on state).
 Method: The crosswalk is produced through the integration of establishment-level ES-202 microdata and the Census Business Register. Records are linked on the basis of common firm identifiers and further associated across data sources, but within common business identifier, on the basis of common geography and industry characteristics.

Access: Access (restricted) is provided through the U.S. Census Bureau's Center for Economic Studies. More information is available at <http://www.ces.census.gov/ces.php/data>.

Longitudinal Employer Household Dynamics-Employer Characteristics File

Purpose: To provide establishment- and firm-level records for purpose of research access through the Research Data Center network maintained by the Center for Economic Studies.

Measures: A variety of establishment- and firm-level measures, including quarterly payroll, monthly employment, and detailed geography and industry, are available. The file contains establishment and firms identifiers, including the federal EIN.

Geography: State, metropolitan area, county, and subcounty (for establishments and firms in over twenty states participating in the LED partnership).

Frequency: Quarterly (1990-2004 depending on state).

Method: The Employer Characteristics File is derived from the integration of state UI and ES-202 micro-data. Technical details are available in:

<http://lehd.dsd.census.gov/led/library/techpapers/tp-2002-05-rev1.pdf>

Access: Access (restricted) is provided through the U.S. Census Bureau's Center for Economic Studies. More information is available at:

<http://www.ces.census.gov/ces.php/data>

LEHD-Custom Extract of Person-Level Data

Purpose: To provide a custom extract of person-level data in LEHD microdata for research through the Research Data Center network maintained by the Center for Economic Studies.

Measures: Extracts from the Individual Characteristics File contain demographic data (including gender, birth date, death date, place of birth) for all individual observations in the UI wage records database, place of residence latitude and longitude (1999-2003), links to other LEHD files including 2000 Decennial Census, the Survey of Income and Program Participation (SIPP) (1990-1996, 2001 panels), and the CPS Annual Social and Demographic Supplement (1976-2003). Data cover the period 1990-2004, updated quarterly. Extracts from the Employment History File contain quarterly earnings data from state UI records for every employer-employee pair in the system. More than 30 states are available now, with agreements to add more as soon as funding is available. Data cover the period 1990-2004, updated quarterly.

The individual-level Human Capital File contains full-time, full-year annual earnings estimates for all persons at all employers (1990-2003, updated annually). Additional variables include the LEHD Program's estimate of an individual's human capital and the decomposed wage components upon which the estimate is based (see Abowd, Lengermann, and McKinney, LEHD TP-2002-09 at <http://lehd.dsd.census.gov/led/library/techpapers/tp-2002-09.pdf>). Note that an

employer-level summarization of this file is available separately (LEHD-HC). Finally, integrated SIPP/Social Security Administration data provides information from every Detailed Earnings Record (W-2) for every respondent providing a valid person identifier, Social Security benefit and application information from the Master Beneficiary Record, the 831 Disability Application files, and the Supplemental Security Record (1990-1996 SIPP panels). These files can be linked to the business-level data using EINs on the Detailed Earnings Record.

- Geography: State, metropolitan area, county, and subcounty (for establishments and firms in over 20 states participating in the LED partnership).
- Frequency: Annually and quarterly (1990-2004 depending on source of extract and state).
- Method: Extracts may be taken from a variety of research, production, administrative, and survey data.
- Access: Access (restricted) is provided through the Census Bureau's Center for Economic Studies. More information is available at <http://www.ces.census.gov/ces.php/data>.

LEHD-Employer Quarterly Workforce Indicators

- Purpose: To provide establishment-level QWI measures for research through the Research Data Center network maintained by the Center for Economic Studies. The LEHD-QWI may be used in combination with the LEHD-Business Register Bridge to match to other Census micro business databases.
- Measures: Contains quarterly measures of workforce composition and worker turnover at the establishment level. The LEHD employer-level measures are created from longitudinally integrated person and establishment-level data. Employer-level measures include (i) Worker and job flows: accessions, separations, job creation, and job destruction, by age and gender of workforce; (ii) Worker composition by gender and age; (iii) Worker compensation for stocks and flows by gender and age; and (iv) Dynamic worker compensation summary statistics for stocks and flows by gender and age.
- Geography: State, metropolitan area, county, and subcounty (for establishments and firms in a subset of states participating in the LED partnership),
- Frequency: Quarterly (1990-2003 depending on State).
- Method: The QWI are derived from the integration of state UI, ES-202 microdata, and other Census administrative data. Technical details are available at <http://lehd.dsd.census.gov/led/library/techpapers/tp-2002-05-rev1.pdf>.
- Access: Access (restricted) is provided through the U.S. Census Bureau's Center for Economic Studies. More information is available at <http://www.ces.census.gov/ces.php/data>.

International Databases

World Trade Organization—International Trade Statistics

- Purpose:** Provides comprehensive, comparable, and up-to-date statistics on trade in merchandise and commercial services.
- Measures:** Trade statistics (imports and exports) for numerous product groups and service categories.
- Geography:** Country, region, and trade blocs.
- Frequency:** Annually (most recently released data are from 2004).
- Method:** International merchandise trade statistics are based on customs records which reflect the physical movement of goods across borders. Statistics on trade in services are derived from data on international service transactions included in the balance of payments statistics, which conforms to the IMF Balance of Payments Manual. Data on trade in services are subject to the misclassification of transactions, failure to record some transactions, and less than reliable source data by non-IMF member countries.
- Access:** More information about the WTO and international trade data are available at: <http://www.wto.org>

World Development Indicators

- Purpose:** The World Bank's compilation of development data.
- Measures:** Key indicators of development such as population, national income, life expectancy and literacy rates; poverty and income distribution; economic activity; and trade, aid and finance including total goods trade, foreign direct investment, external debt, and current account balance.
- Geography:** Data available for 152 countries and 14 regional and trade groups.
- Frequency:** Annually (World Development Indicators 2005 has data as of 2003).
- Method:** Data is obtained from official sources in each member country. Differences in timing and reporting practices may cause inconsistencies among data from different sources. Some adjustments are made in the balance of payments to account for fiscal/calendar-year differences. Other methods are used to be consistent in definition, timing, and methods.
- Access:** More information about the World Development Indicators data are available at <http://worldbank.org/data>.

Organization for Economic Cooperation and Development—International Trade Statistics

- Purpose:** To provide data to the public on the foreign trade of OECD countries, yielding insight into the most recent trends in trading patterns among OECD countries and with the rest of the world.

- Measures: Trade (exports and imports) in goods and services. Available data available show volume of exports and imports in U.S. dollars, trend data over 10 years, and trade by commodity and type of service.
- Geography: Thirty OECD member countries
- Frequency: Annually and monthly (made available online).
- Method: UN recommended trade-data collection methodology. In addition, the European countries use the Intrastat system, which records the movement of goods within the European Union as recorded by each member state. Data are broken down by economic groupings, by country, and by region, and include seasonally adjusted series as well as calculated indicators.
- Access: More information about the OECD International trade databases is available at <http://www.oecd.org/statisticsdata>.

United Nations Statistics Division

- Purpose: The Statistics Division compiles statistics from many international sources and produces global updates, including the [Statistical Yearbook](#), [World Statistics Pocketbook](#) and yearbooks in specialized fields of statistics. Databases include: The Commodity Trade Statistics Database, Demographic and Social Statistics Databases, Millennium Indicators Database, Monthly Bulletin of Statistics Online, National Accounts Main Aggregates Database, and the UN Common Database.
- Measures: The National Accounts Statistics database contains a complete and consistent set of time series from 1970 onwards of main national accounts aggregates for all UN member states in the world. It is maintained and updated on the basis of annual collections of the official annual national accounts statistics supplemented by estimates of national accounts statistics for those years and countries for which the official statistics has incomplete or inconsistent information. In addition, to the values of national accounts statistics, it contains analytical indicators and ratios derived from the main national accounts aggregates related to economic structure and development.
- Geography: All UN member countries.
- Frequency: Annually (made available online).
- Method: Member countries report their information to the UN Statistical Division. National accounts questionnaires are supplemented by estimates based on data and proxy economic indicators derived from national and international sources.
- Access: More information about the UN Statistical Division databases is available at <http://unstats.un.org>.