Services Trade and Professional, Scientific and Technical Firms: A Survey of Small to Medium-Sized California Firms

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Working Paper

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July 2007

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Introduction

The growth of services international trade has led to the loss of white-collar jobs to offshore providers and offshore divisions of multinationals, but also to gains in revenues, profits, and to some extent employment for US services firms with global customers. Interviews of large firms and data on multinationals indicate that firms with an international customer base are likely to have offshore production and offshore suppliers. Some large firms that serve only a domestic base also draw globally for production, but many produce entirely domestically.[2] Economic theory suggests that there is a net positive effect on the economy from this type of globalization (in terms of output and total personal income), but that there may be a significant redistribution of activity in reaching this new level of output and income.[3]

Most of the empirical work on this topic has come from aggregate data analyses, from surveys of large firms, or from the anecdotal experience of individual firms. Much less information is available on the distributional aspects of this globalization, although there has been some attention to how employment and wage impacts vary among different white-collar occupations (Jensen and Kletzer 2005) and how effects may vary among geographic areas (Kroll 2005, Atkinson and Wial 2007). Little is known about

[1] This survey was part of a larger research effort that the authors have conducted in collaboration with Professor Dwight Jaffee, Haas School of Business, and Dr. Ashok Bardhan, Fisher Center for Real Estate and Urban Economics, University of California Berkeley.
[2] Bardhan, Jaffee and Kroll 2005 report these findings from a set of interviews conducted in California.
[3] Jaffee 2005 gives an overview of the theoretical arguments regarding the effects of international trade in services at the national level.

how small and medium sized firms are affected by trends in services international trade and offshoring—the advantages they may reap from global opportunities and the challenges they may face from global competition.

This paper reports on a survey of small to medium-sized California-headquartered firms in professional, scientific and technical services (NAICS 54), an industrial category that has a relatively high share of tradable white-collar employees. The survey shows that the majority of small to mid-sized professional, scientific and technical (P-S-T) firms do not participate in any type of services trade. Many of those involved in trade are both exporters and importers of services, while those not involved in any type of trade may still be affected by competition with firms with global linkages or by broader competitive pressures of the global economy.

We begin with a brief description of occupation characteristics and employment and wage trends within the P-S-T services sectors within California and the United States. We then introduce our survey approach and methodology. The survey results cover the degree to which firms have international linkages, the types of linkages, their geographic spread, as well as the types of impacts firms experience from the globalization of services and white collar work. The paper concludes with an assessment of how globalization and services offshoring are affecting small to medium sized P-S-T firms and a discussion of survey limitations and additional questions.

Tradability and Professional, Scientific and Technical Services

Our earlier research has shown that 12 percent of employees in the US are in white-collar occupations that are "tradable"--i.e. can be done remotely (Bardhan and

Kroll 2003, Kroll 2005). The P-S-T services sector has a far higher share employed in these occupations (37 percent) than in the nationwide mix of the employed labor force, as shown in Table 1. Academics and journalists have documented examples of exporting, outsourcing and offshoring activity in several P-S-T sectors, including legal services, accounting, architecture and engineering, computer systems design, and research and development. (Bardhan and Jaffee 2005, Cannan 2007, Frangos and Chang 2003, Gonzalez, Gasco and Llopis 2006, Karmarkar 2004).

Table 1
US Employment in White-Collar Tradable Occupations
By Professional, Scientific and Technical Categories 2006

NAICS	NAICS Title	Total Employment	White-Collar Tradable	Share White-Collar Tradable
5411	Legal Services	1,174,330	276,420	23.5%
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	826,340	571,220	69.1%
5413	Architectural, Engineering, and Related Services	1,361,280	251,550	18.5%
5414	Specialized Design Services	135,750	49,850	36.7%
5415	Computer Systems Design and Related Services	1,254,320	839,790	67.0%
5416	Management, Scientific, and Technical Consulting Services	909,540	373,870	41.1%
5417	Scientific Research and Development Services	586,220	122,790	20.9%
5418	Advertising and Related Services	452,840	102,110	22.5%
5419	Other Professional, Scientific, and Technical Services	542,500	109,110	20.1%
54	**TOTAL Professional, Scientific, and Technical Services**	**7,243,120**	**2,696,710**	**37.2%**
All Industries	**TOTAL**	**132,604,980**	**15,849,780**	**12.0%**

Source: Author from Bureau of Labor Statistics OES data series, May 2005. The occupations included as white-collar tradable are described in detail in Kroll 2005.

In terms of employment growth, there is little evidence that P-S-T sectors are suffering from offshoring. More likely, while offshoring is occurring in some of these sectors, other sectors (or even the same sectors) are also experiencing some growth opportunities related to increased global trade. As shown in Table 2, California

employment in the aggregate P-S-T services category has been growing faster than either overall nonfarm employment or overall employment in services-providing sectors.

Table 2
California Professional, Scientific and Technical Sectors
Employment Levels and Change

NAICS	Industry	2006	Annual Rate of Change 95-00	Annual Rate of Change 00-06	Growth Relative to All Jobs 95-00	Growth Relative to All Jobs 00-06
	Total Nonfarm	15,072,800	3.1%	0.7%	1.0	1.0
	Services Providing	12,603,900	3.1%	1.0%	1.0	1.5
	Services Providing except Prof/Sci/Tech	11,586,700	2.9%	1.0%	0.9	1.5
54	Professional, Scientific and Technical Services	1,017,200	5.7%	1.6%	1.8	2.5
5411	Legal Services	139,100	1.0%	1.4%	0.3	2.2
5412	Accounting, Tax Preparation, Bookkeeping and Payroll Services	114,200	-0.9%	2.4%	-0.3	3.6
5413	Architectural, Engineering and Related Services	176,200	6.0%	2.1%	1.9	3.2
5414	Specialized Design Services	27,100	5.4%	2.5%	1.7	3.9
5415	Computer Systems Design and Related Services	186,100	15.8%	-1.6%	5.1	-2.4
5416	Management, Scientific and Technical Consulting Services	154,500	9.9%	8.4%	3.2	12.7
5417	Scientific Research and Development Services	99,900	3.8%	1.9%	1.2	2.9
5418	Advertising and Related Services	62,900	4.0%	-2.2%	1.3	-3.3
5419	Other Professional Scientific and Technical Services	57,300	2.6%	0.5%	0.8	0.7

Source: California Employment Development Department, Labor Market Information web site, State and Local Industry data, March 2007.

Two sectors within the P-S-T category have not conformed to this trend since 2000. Computer systems design, the largest P-S-T sector, has lost employment since 2000, as has advertising. Employment change over this period in computer systems design, and quite possibly in advertising as well, in part reflects the dot-com bust. Some restructuring likely has also occurred in these sectors, which may in part reflect offshoring. Computer systems design employment recovered to grow as quickly as the rest of the P-S-T category only in 2006, while growth in advertising jobs continues to lag

the other sectors. Relatively strong performance of the accounting, tax preparation, bookkeeping and payroll services sector may be the consequence of regulatory reform through the Sarbanes-Oxley Act, which greatly increased the need for internal and external oversight of firm finances. This shift in priorities may have counteracted the potential for offshoring routine accounting work. The very strong employment growth in management, scientific and technical consulting may reflect increased opportunities abroad as well as in the US market.

Wage trends have been weaker than employment trends in California P-S-T sectors. Data is not available by sector and occupation for California, and wage data by sector is only available through 2004. Instead, we look at wages in the occupations that are most heavily represented in the P-S-T sectors. The ten occupations which account for the largest number of P-S-T employees (nationwide) are shown in Table 3, with their employment and wage trends in California and the US from 2002 to 2006 (comparable data for total occupations is not available for California before 2002). These 10 occupations account for two-thirds of US employment in P-S-T sectors. Many of these occupations performed weakly in California in the 2002 to 2006 period. In half of these occupations, employment growth far out-paced the state overall job growth for the period, yet 8 out of the 10 sectors had slower wage growth, as shown in Table 3. Although wages for all California occupations grew faster than nationwide, wages in almost all of the tradable occupations concentrated most heavily in P-S-T sectors grew more slowly than US wages *and* more slowly than most California wages.

Table 3 Employment and Wage Change 2002-2006, Largest Professional, Scientific and Technical Sector Occupations, California and US							
				Change 2002-2006		Relative Wage Growth Indices	
Occupation Code	Occupation Title	Employment	Median Wage	Employment	Median Wage	Compared to all Occupations	California Compared to US
California							
00-0000	All Occupations	15,065,750	$34,040	4.2%	11.5%	1.00	1.18
13-1111	Management Analysts	63,700	$71,320	33.2%	11.4%	0.99	0.89
13-2011	Accountants and Auditors	124,560	$57,820	23.9%	9.9%	0.86	0.61
15-1021	Computer Programmers	35,040	$73,610	-32.5%	5.8%	0.50	0.67
15-1031	Computer Software Engineers (Ap'ns)	84,550	$90,140	31.8%	9.8%	0.85	0.78
15-1032	Computer Software Engineers (Sys)	50,400	$93,970	14.0%	13.0%	1.12	0.85
15-1041	Computer Support Specialists	59,520	$46,640	8.4%	6.0%	0.52	0.99
15-1051	Computer Systems Analysts	49,790	$74,260	0.8%	13.5%	1.17	1.24
23-2011	Paralegals and Legal Assistants	24,070	$50,870	-6.3%	2.6%	0.22	0.19
43-3031	Bookkeeping/Accounting/Audit Clerks	208,200	$34,810	3.1%	10.5%	0.91	0.90
43-4051	Customer Service Representatives	199,440	$31,810	3.9%	8.4%	0.73	1.06
United States							
00-0000	All Occupations	132,604,980	$30,400	4.0%	9.8%	1.00	
13-1111	Management Analysts	476,070	$68,050	21.2%	12.8%	1.31	
13-2011	Accountants and Auditors	1,092,960	$54,630	23.0%	16.2%	1.66	
15-1021	Computer Programmers	396,020	$65,510	-13.4%	8.7%	0.88	
15-1031	Computer Software Engineers (Ap'ns)	472,520	$79,780	32.4%	12.5%	1.28	
15-1032	Computer Software Engineers (Sys)	329,060	$85,370	29.0%	15.3%	1.56	
15-1041	Computer Support Specialists	514,460	$41,470	7.5%	6.1%	0.62	
15-1051	Computer Systems Analysts	446,460	$69,760	-4.6%	10.9%	1.12	
23-2011	Paralegals and Legal Assistants	229,430	$43,040	18.7%	13.4%	1.37	
43-3031	Bookkeeping/Accounting/Audit Clerks	1,856,890	$30,560	7.4%	11.6%	1.19	
43-4051	Customer Service Representatives	2,147,770	$28,330	15.8%	8.0%	0.81	
Source: Author calculations from US Bureau of Labor Statistics Occupation Employment Statistics, http://www.bls.gov/oes/home.htm							

These data do not demonstrate a direct link between the competitive pressures of growing international trade in services and wage and employment growth levels in P-S-T sectors. If these sectors were particularly vulnerable to offshoring, then we would expect to see slower wage growth at the US level as well, but the majority of these occupation categories had faster wage growth than the overall average, nationwide. The California numbers may instead be reflecting pressure to lower job costs within the state, relative to alternative areas elsewhere in the US as well as offshore.

The data do indicate that the level and direction of growth varies among sectors and occupations. The survey allows us to further explore the factors leading to this variation and the degree to which globalization may be involved.

Survey Context and Purpose

This survey was conducted as one element of a larger set of studies of the effects of services offshoring on the California economy. The larger study, begun in 2005, draws on data analysis, interviews of California's largest firms, interviews of service providers to displaced and unemployed workers and to small businesses, and selective surveys of firms and service providers. We explore both the advantages and disadvantages to California firms of increasingly global services trade and the changing demands for services generated by these trends in services international trade. (See Kroll, Bardhan, and Jaffee 2005).

The purposes of the survey of small to medium-sized P-S-T firms reported here include:

- To determine the degree to which small to medium sized firms participate in global trade in services
- To understand to what extent size matters in the decision to offshore employment or to outsource functions offshore
- To understand the motivations of firms participating in various aspects of global services trade
- To identify consequences of trade in services on firm size and structure
- To identify consequences of growing trade in services for firms that do not directly participate in this trade.

Survey Sample, Methodology and Response Rate

Within the P-S-T category, the survey covers firms of employee size ranging between 20 and 500. Earlier interviews focused on firms of 500 or more employees. In addition, extensive research has been done on the large firms in the computer systems design category. (We excluded firms with fewer than 20 employees to increase our coverage of the overall employment base within these sectors.) Firms of small to medium size offer a window into companies large enough to have a diverse client base (perhaps international or with the potential to build an international base) but that may lack flexibility compared to larger firms (due to limited scale economies) in responding to competition from abroad or in pursuing opportunities.

The survey sample was drawn from firms located in California that are listed in the OneSource database. OneSource is a business information database built from regulatory filings, news releases, analyst reports, industry information, and commercial

information providers. The source covers a large share of California's population of firms in the NAICS 54 category. OneSource lists 6,572 firms in NAICS 54 in the 20 to 500 size range in California, compared to a count of 6,978 firms (and 8,997 establishments) in this size range identified by the Small Business Administration (2003 data). We randomly selected 3 percent of the OneSource firms to survey (approximately 200), weighting the sample to reflect the shares of firms in the 4-digit sectors within NAICS 54.

The survey was designed to be completed in between 1 and 10 minutes, depending on the degree of international linkages of the firm. Firms were asked first if international trade in services (foreign customers, offshore employees, offshore services, foreign competition, or competition from domestic firms using offshore services) affected their firm. Those who reported no effects were asked a few brief demographic questions about the firm (sector, size, location, age). Those reporting effects were asked briefly about customer base, employee location, purchase of foreign services, and perceptions of how expanding trade in services and white-collar work impacts the firm.

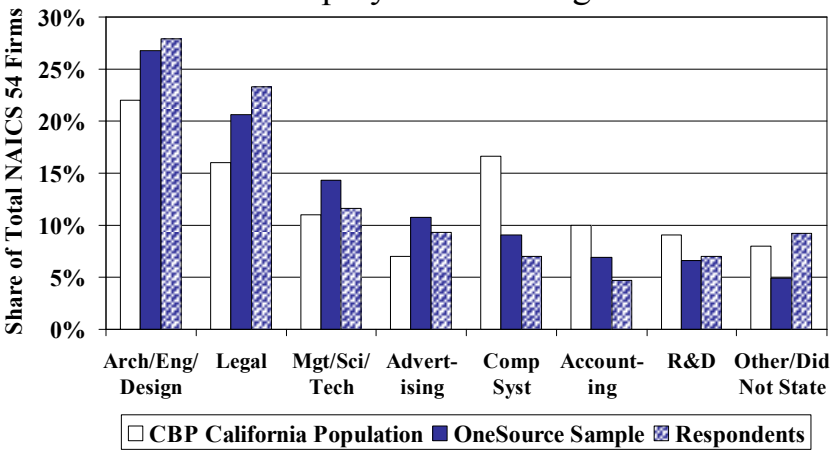
The survey was conducted via e-mail, on the web, and by fax and telephone during January 2007. We obtained e-mail addresses from OneSource or websites for approximately 80 percent of the sample. Using the Surveymonkey survey software, we created a web-based survey instrument and sent e-mails using the Surveymonkey list management system to the sample firms, inviting their participation in the survey. Firms without e-mail addresses, or where the e-mail was filtered as spam were contacted by telephone or fax and invited to respond over the phone, on the web, or via fax. Reminders were e-mailed to nonrespondents at approximately 1-week intervals over the

course of a month. Follow-up phone calls were made to both phone and e-mail nonrespondents.

We obtained an overall response rate of 21 percent. Response rates were strongest for those responding on the web following an e-mail and those responding to the survey administered over the phone. Response rates were somewhat higher among architecture, engineering and design firms and legal firms, and particularly low for computer systems design firms, accountants, and management, scientific and technical consulting firms. The timing was problematic for accounting firms, already in the midst of tax preparation and reluctant to take even a few minutes to respond to questions. For computer system design firms, many of the company executives were involved in the daily high-paced operations of the firm and would not take the time to participate.

Figure 1 shows the distribution of the OneSource sample (which is equivalent to the distribution of the OneSource firm population of California firms in this size range), of the respondents, and of the establishments in this size range reported by County Business Patterns (no equivalent information is available at the firm level rather than establishment level by 4-digit NAICS). In addition to the under-representative response rate for computer systems design firms, the population of computer system design firms may be underrepresented in the OneSource population, if firm proportional distributions are similar to establishment distributions.

Figure 1
Survey Sample, Respondents, and California Establishment Population
20-500 Employee Size Categories

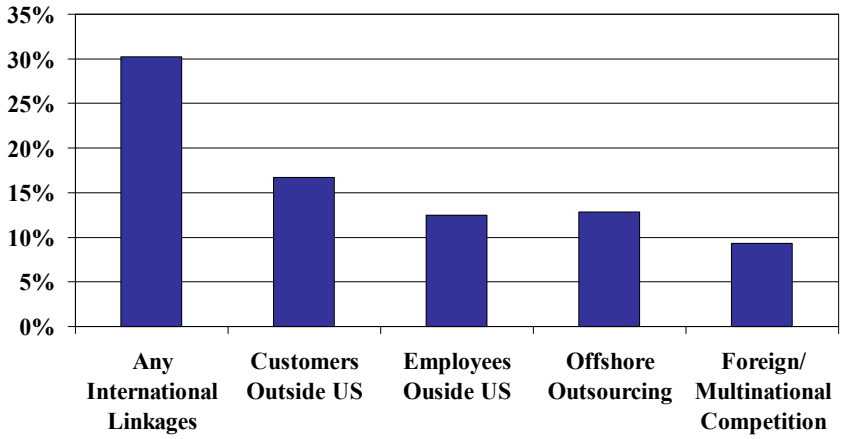


Source: Author sample drawn from OneSource database December 2006; survey January 2007; US County Business Patterns 2004.

Firms with International Linkages

The majority of the P-S-T firms reported no international linkages or competition, but 30 percent of responding firms reported some type of international linkage involving international markets, employees located abroad, imported imports, or competition with foreign firms or multinational firms (or some combination of these factors). The largest proportion of those with international linkages had customers abroad, as shown in Figure 2, while the smallest proportion reported facing competition from foreign or multinational firms.

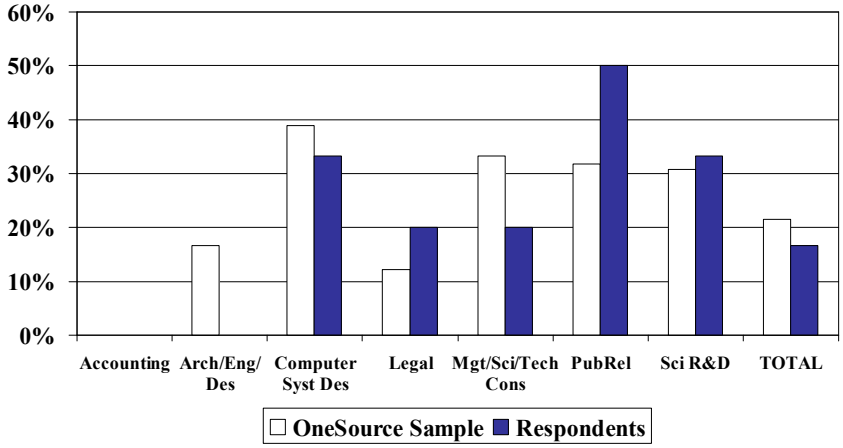
Figure 2
Does the Firm Have International Linkages?



Source: Author survey, January 2007.

Using market information from the OneSource data and web pages, we were able to compare the respondents to the overall sample, to see if those with international trade activity had a higher (or lower) response rate to the survey. Overall, services exporting firms were slightly less likely than other firms to respond to the survey, as shown in Figure 3. None of the architecture/engineering/design firms responding to the survey reported international sales, while over 15 percent of the OneSource sample had international customers. In some sectors (most notably legal and public relations firms), responding firms were more likely than the sample population to be exporters. We consider the implications of the differences in interpreting the results, later in the paper.

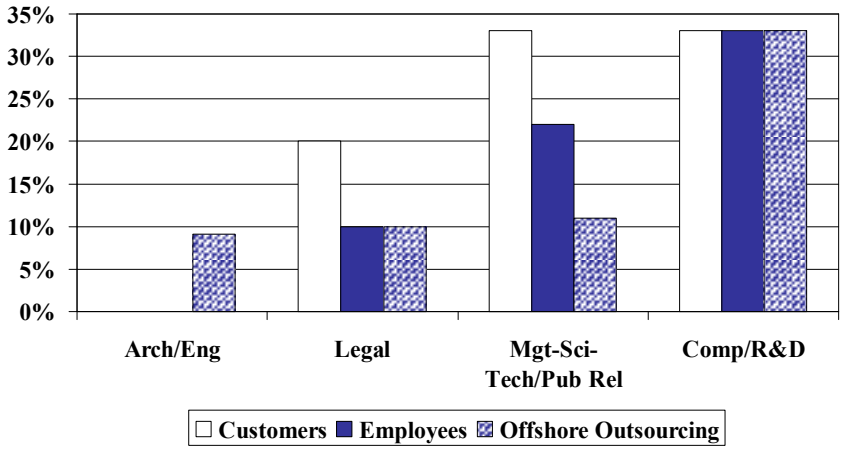
Figure 3
Share of Sample and Respondents with Foreign Customers



Source: Author sample drawn from OneSource database December 2006; survey January 2007.

Because of small sample sizes, we aggregate some categories of firms in summarizing the results. Management, scientific and technical and public relations firms, combined, and computer system design and research and development firms, combined, were more likely to have customers abroad. Computer system design and research and development firms also had the highest shares of employees abroad and of offshore outsourcing. Architecture, engineering and design firms had no customers or employees abroad and were among the least likely to purchase services from offshore providers. (See Figure 4.)

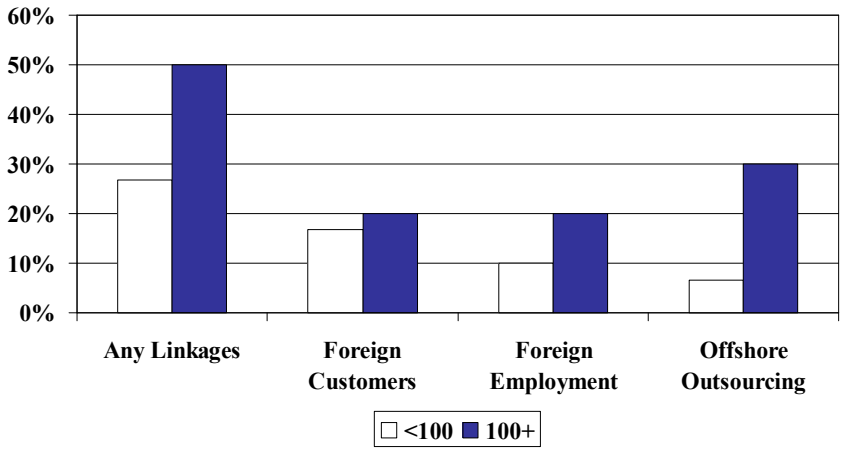
Figure 4
Share with International Linkages by Type of Firm



Source: Author survey, January 2007.

Firms with 100 employees or more ("medium-sized") were more likely than smaller firms to have some type of international linkages. Based on the OneSource sample data, medium-sized firms were significantly more likely than smaller firms to have foreign customers, while smaller firms were more likely to have a customer base restricted to California. Survey respondent data is shown in Figure 5. There was little difference by size of firm in the share of respondents with foreign customers, but medium-sized firms were more likely than smaller firms to have employees abroad and were much more likely to offshore some of their work abroad.

Figure 5
Linkages by Firm Employment Size Range



Source: Author survey, January 2007.

Offshore Employment and Imported Services

Among survey respondents, only nine firms (21 percent) reported having foreign sales, offshore employees, and/or purchasing offshore services--these firms are listed anonymously by characteristics in Table 4. All but one of the firms with offshore employees also purchased offshore services, and only one of the firms purchasing offshore services had no offshore employees. All but one of the firms with offshore employees also served an international market base, but just over half of the firms with foreign customers also had foreign employees or purchased foreign services. The three firms with foreign sales but neither foreign employees nor offshore services purchases were small firms (with fewer than 50 employees). Two firms, one small and one medium-sized, had foreign employees and/or offshore services purchases but no foreign sales.

Table 4 Type of International Linkages by Respondent				
Firm Sector of Respondent	**Employment Range of Firm**	**Foreign Sales**	**Employees Offshore**	**Imported Services (Outsourcing)**
Architecture, Engineering and Design	100 to 499			Yes
Computer Design Services	100 to 499	Yes	Yes	Yes
Legal Services	25 to 49	Yes	Yes	Yes
Legal Services	25 to 49	Yes		
Management, Scientific and Technical Consulting	25 to 49	Yes	Yes	
Management, Scientific and Technical Consulting	50 to 99		Yes	Yes
Public Relations	Less than 25	Yes		
Public Relations	Less than 25	Yes		
Research and Development	100 to 499	Yes	Yes	Yes
Source: Author survey January 2007.				

Firms were primarily offshoring professional and technical work. All of the offshore employees were of this type, as were most of the offshore services (see Table 5). One firm offshored back office work in addition to professional and technical work. This firm had most of its operations offshore because it was producing a product that originally was licensed in China. Offshore employment was spread broadly throughout the world, with technical more likely to be in Asia and consultant and legal work found in Europe (however, these location characteristics may be the result of the particularities of the small sample that had offshore employees). With the exception of the legal firm, all offshore outsourcing was in Asia.

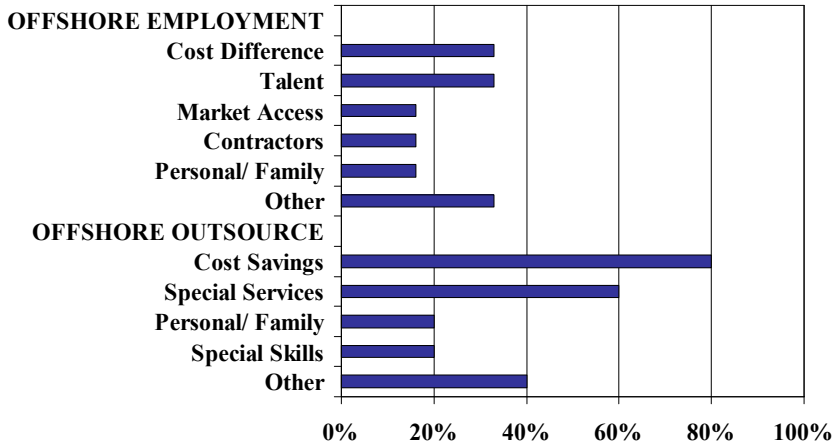
Table 5
Type and Location of Offshore Employment and Services Outsourcing by Respondent

Firm Sector of Respondent	Employment Range of Firm	Type of Employment Offshore	Offshore Employment Location	Type of Work Outsourced Offshore	Offshore Outsourcing Location
Architecture/ Engineering/ Design	100-499			Engineering/ Design	India
Computer/ Technical	100-499	Professional/ Technical	China	Computer Software; Engineering/ Design; R&D; Back Office	China
Research and Development	100-499	Professional/ Technical	Taiwan	R&D	China
Management/ Scientific/ Technical	50-99	Professional/ Technical	Mexico	Computer Software; Engineering/ Design	China
Management/ Scientific/ Technical	25-49	Professional/ Technical	Western Europe		
Legal	25-49	Professional/ Technical	Western Europe	Legal	China, India, Japan, Western Europe, Canada

Source: Author survey January 2007.

Cost savings were the primary reason firms purchased offshore services, and cost differences were among the most frequently mentioned reasons for offshore employment, as shown in Figure 6. Accessing talent and special services were also important factors. This is consistent with our longer personal interviews with a few small firms, who were able to afford talent from abroad for which they were uncompetitive among larger firms within the US. Other considerations included personal and family ties, market access, freedom from regulation, and the advantages of working in a variety of time zones. These are consistent with factors mentioned by larger firms in longer interviews (Kroll, Bardhan, and Jaffee 2005).

Figure 6
Why Offshore Employment or Purchase Offshore Services?

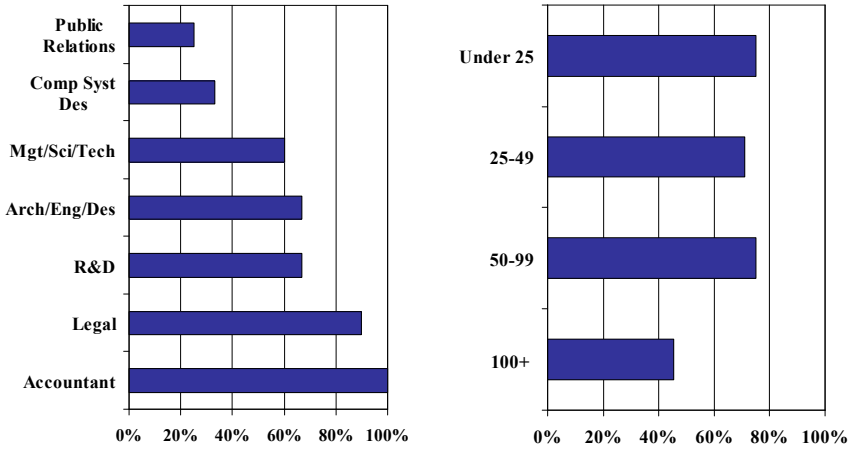


Source: Author survey, January 2007.

Overall Effects of Increased Services International Trade

Over two-thirds of firms felt increased international trade in services had no effect on their business. None of the accounting firms that responded to the survey reported any current effects (although one had previously used offshore outsourced services but had ended that agreement), while at the other extreme, three-fourths of the public relations firms and two-thirds of the computer systems design firms experienced impacts from growing services international trade. Mid-sized firms (100 employees and more) were more likely to cite some type of effect of increased services trade than smaller firms. (See Figure 7.)

Figure 7
No Effect of Increased Services Trade
By Sector and Firm Size of Respondent



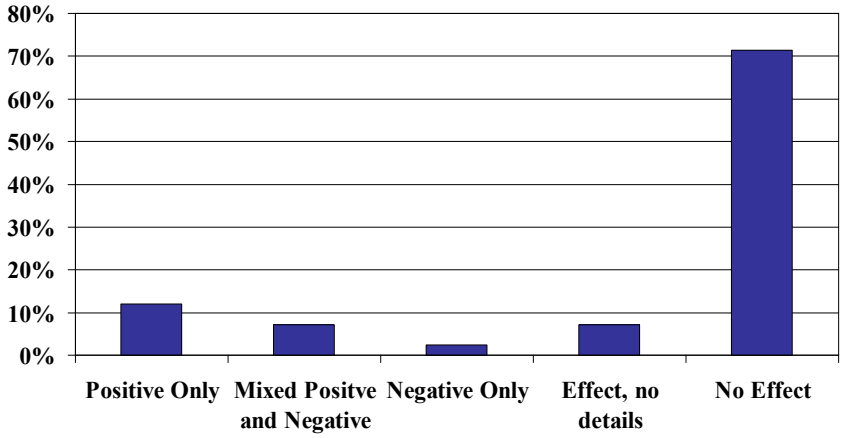
Source: Author survey, January 2007.

More firms reported positive effects (such as improved access to markets, cost savings, and access to talent) than reported negative effects (such as cost pressures and increased competition from domestic, foreign, or multinational firms). About one-third of firms experiencing effects reported both positive and negative effects. (See Figure 8.) Competitive pressures were reported only by small firms (with fewer than 100 employees). Those with 100 or more employees reported positive effects, or in one case the ambiguous effect of a change in the firm's structure, which could be positive, negative, or neutral. Only one firm reported only negative effects--this firm had fewer than 25 employees and was also the only firm expecting to decrease employment in California over the next 5 years.

Effects are described in more detail in Figure 9. The small group of firms that reported experiencing impacts from increased services trade cited a wide range of advantages and challenges. Market opportunities were the most frequently mentioned

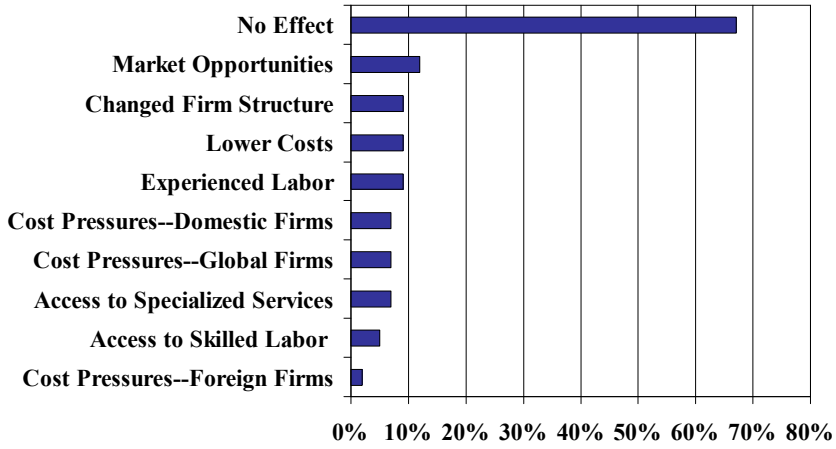
positive impact, while cost pressures from domestic and multinational firms were more important than competition from foreign firms, on the negative side.

Figure 8
Effects of Growing Services Trade on Firms



Source: Author survey, January 2007.

Figure 9
Effects of Increased Services Trade
Share of Respondents



Source: Author survey, January 2007.

The effect of growing services trade on firm structure is suggestive but also deserves further research. Changes in firm structure were as frequent an effect of services globalization as were opportunities to lower costs or to access experienced labor. These changes could refer to anything from adding employees overseas to consolidating or dispersing operations across different geographic areas. In addition to the survey response, some firms we contacted for more detailed interviews at the pre-testing stage of the study reported no direct effects of growing services trade but buy-out pressures from larger firms interested in expanding their geographic and professional scope.

Conclusions

This study reviewed published data on the professional, scientific and technical industry (NAICS 54) in California and surveyed a sample of California P-S-T firms small and medium-sized firms on the ways in which increasing opportunities for services international trade affect employment location, sales, purchases, and the general competitive climate. Published data indicates that sectors in the P-S-T industry have occupation mixes with relatively high shares of "tradable" occupations. Despite (or perhaps because of) this mix, the industry overall, and several sectors within the industry, have experienced faster than average employment growth since 2000. In contrast, wage growth has been slower than average in the California P-S-T industry and in most of its sectors. This effect is not apparent at the nationwide level for these occupations, suggesting that the "tradability effect" may mix with California's high cost structure, leading to slower wage growth for California workers in occupations that can be done remotely.

The survey results indicate that effects of services tradability very widely across firms. This is consistent with the ambiguous conclusions from the published data. Many small to medium-sized professional, scientific and technical firms are unaware of any effects of services foreign trade on their business opportunities, whether positive or negative. Of those experiencing some type of impact, the effects are often mixed, a combination of increased opportunities for sales, access to lower cost labor and a wider pool of talent, but also greater competitive pressures from other firms making use of these same sources of labor and services.

Smaller firms were less likely to participate in most aspects of services foreign trade than were larger firms. Smaller firms also showed more vulnerability to negative effects of increased competition than did medium-sized firms. These firms were more likely to have a client base focused mainly on California. This may reflect partly personal choice and partly economies of scale. It may be easiest for a small firm to work with a local client base, rather than spread staff thinly across a wide geographic base. The administrative costs of adding offshore employees or providers may be less cost-effective for a small firm than for a firm with a larger client and employee base.

Because of the size of the sample and respondents, we were not able to go into much detail regarding variations in effects by sector within the P-S-T industry. A few characteristics and differences are worth noting, as a direction for future research. First, both foreign employment and offshore outsourcing was primarily professional and technical, whatever the industry. The only firm offshoring back office work did much of its other work offshore as well, and product development offshore preceded the decision to offshore back-office work. Second, China and India were the most likely venues for

offshore employment and offshore outsourcing by technical firms involved in computer design, engineering, and research and development, while a broader range of locations, including Western Europe and Mexico, were involved for legal and management, scientific and technical consulting firms. Third, the classic view of offshoring (lowering the costs of production) was more likely to occur with the more technical firms and products, while legal and consulting firms were more likely to have offshore employees and service providers to satisfy the demands of their existing US or foreign customers in the foreign location.

Many of the responses were consistent among firm types, making the lack of detail on different response rates by sector less troublesome. Nevertheless, because of low response rates, some questions remain unanswered. For example, the degree of offshoring by accounting firms cannot be addressed from the survey results because of weak response rates among that group. A different approach may be needed to further assess the degree of offshoring by computer system design firms and the effects on employees within that sector.

The results of this research have implications for understanding the process of globalization and for public policy concerns. The positive and negative effects of globalization are often shared by the same firm. However, where effects are experienced separately, smaller firms appear more vulnerable to negative effects, and less able to benefit from lower costs and greater range of expertise available from drawing on offshore resources. Trade assistance programs targeted to small and medium-sized businesses may thus be an important element in responding to the effects of globalizing services trade. Further research would be needed to identify exactly what factors make

smaller firms more vulnerable to the costs and less able to take advantage of the benefits of services trade. Economies of scale are likely to be one important factor, but other factors, such as access to information, diversity of customer base, and diversity of staff may also be advantages for larger firms over smaller firms.

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