

**Understanding the Domestic Labor Market Impact of Offshore Services Outsourcing:
Measurement Issues**

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Introduction

Over a remarkably short time frame, thinking about the production of services and services employment has changed dramatically. For a sector once considerable “nontradable,” measuring services trade is now a task of considerable energy and importance. The possible domestic employment implications of rising services trade, that is services offshoring, attract significant attention and political interest.¹ The literature on services offshoring is expanding, although the activity remains “an elusive phenomenon.”² Much of that elusiveness springs from data limitations and measurement concerns, the subject of this conference. The increasing role of multi-national corporations (MNCs), technology transfer, and increasing trade in services are just three activities associated with globalization where statistical and measurement limitations are widely acknowledged. Scholars interested in the labor market implications of increasing trade in services add one more area to this (partial) list: detailed time-series occupational data. Understanding the relocation of work, but not the workers doing the work, and more broadly, understanding the nature of work that is potentially offshorable, requires consistent detailed occupational data.

Before turning to the current data limitations and ongoing efforts to address the limitations, it is useful to establish definitions and provide context. For the vein of research focusing on domestic employment, one research goal is to understand and measure the magnitude and significance of shifting of business operations to offshore (foreign) locations and impact on American workforce (employment and earnings). The labor market impact questions include: estimates of jobs moved offshore; estimates of lost potential job growth (because jobs moved offshore); jobs added due to foreign work located in the US; jobs added due to efficiency gains; shifts in occupations; changes in earnings and the distribution of earnings; job displacement (numbers, worker characteristics, unemployment durations, UI receipt, re-employment).

Stated this way, it becomes clearer that the offshoring questions are not new, in that similar questions have been asked about and for the manufacturing sector for decades. These questions have, however, taken on heightened awareness with growth of services trade. This

¹ Services offshoring refers to the (potential) migration of jobs (but not the people performing them) across national borders, mostly from rich countries to poor ones, with imported products and activities flowing back to the US.

² See Jensen and Kletzer (2008) for citations to the literature. The phrase “elusive phenomenon” appears in

heightened awareness arises in part from the manufacturing/production worker focus becoming business and professional services/"white-collar" and professionals. This does not imply that everything is the same and nothing is new. Rather, the potential for services offshoring highlights tasks and occupations in a way that manufacturing import competition did not (and does not). Also, the implications for educational attainment may be different, as a result of the different impact on occupations.

One focused avenue in the literature on services offshoring attempts to address directly the occupational or task nature of the activity. Papers by Jensen and Kletzer (2006, 2008), Blinder (2006, 2007, 2009), van Welsum and Reif (2009), and Moncarz, Wolf, and Wright (2008) share a general approach to measuring potential offshorability by looking at the task and activity content of jobs. Although these papers differ in methodology and details, they share a common starting point that movable jobs are those with: little face-to-face customer contact; high information content, work process is internet enabled and/or telecommutable (see Bardhan and Kroll (2003); Dossani and Kenney (2003), and Blinder (2006)). More informally, it is commonly believed that if "it can be sent down a wire (or wireless)," it is offshorable. These papers have all yielded sets of occupations varying in their "potential offshorability." One possible next step is to, as noted in chapter 4 of NAPA (October 2006), consider that the offshoring of services should produce changes in the occupational structure of firms and establishments. In other words, shifts in certain (potentially "movable") occupations may be consistent with offshoring. Shifts in these occupations, within industries with (intermediate) services trade, may be more compelling evidence.

This paper proceeds with some thoughts on possible enhanced links between studies of (domestic) outsourcing and (international) offshore outsourcing (section 1). Section 2 describes the basic principles of offshorability and the data on the content and context of jobs (O*Net), together with occupational employment and earnings (Occupational Employment Statistics, OES). Section 3 considers the preliminary evidence of shifts of the occupational employment distribution. Section 5 concludes.

1. How studies of offshoring may benefit from literature on outsourcing

Over the past five years, the potential for services offshoring has generated remarkable attention for an internal-to-the-firm economic activity, and area of research, historically

undertaken behind-the-scenes and not in the spotlight. These behind-the-scenes activities are the “make-or-buy” points – the decisions to use in-house (own) employees versus purchasing completed tasks from other establishments.

Interest in domestic contracting out surged in the 1990s, with attention paid to temporary help agencies. Katharine Abraham’s research led the way, with her 1988 and 1990 papers on market-mediated work arrangements. Then, as now, research progress was slowed by data limitations. The still-small literature on domestic outsourcing now reveals significant growth in the activity over the past 25 years (see papers by Segal and Sullivan (1997), Houseman (2001), and Dey, Houseman and Polivka (2007)).

To date, research on offshore outsourcing has proceeded without much of a link to the domestic outsourcing literature. Interestingly, perspectives from international trade have dominated the offshore outsourcing literature, in a services version of “does trade cost jobs?”. Yet the domestic outsourcing literature has implications for offshore outsourcing research. Domestic outsourcing can produce shifts in the industry structure of employment. Contractual production workers are employees of temporary help agencies (or more broadly, firms in the business services sector). In-house, production workers are (usually) employed by manufacturing firms. Simply put, as stated by Dey, Houseman and Polivka (2007), “. . .the number and occupational distribution of workers classified in the manufacturing sector changes, even if the number and occupational distribution of workers performing the tasks does not.” (pg. 2). Thus the domestic outsourcing literature looks at shifts in the pattern of occupational employment across industries.³ Following the logic that offshore outsourcing involves the reallocation of production tasks within establishments, firms and industries, we might expect to see shifts in the pattern of occupations within industries, and most specifically for “potentially movable” occupations within industries where business and professional services imports have increased. Investigating this (weakly formed) hypothesis involves bringing together data on (potentially movable) occupations, occupational employment and services trade.

³ In fairness to the domestic outsourcing literature, it considers a broader range of questions from industrial relations to labor demand, including job security, wages, compensation and benefits costs, job training, hiring, firing and search costs.

2. Measuring task content of potentially movable services occupations⁴

The literature on offshoring posits that movable jobs are those with: little face-to-face customer contact; high information content, work process is internet enabled and/or telecommutable.⁵ A great deal of attention is paid to internet-enabled: the expansion of broadband and wireless (and the broad use of “off the shelf” software programs) having greatly reduced the “transportation costs” of information. Having developed a set of tradable services occupations, the next step is to consider the detailed characteristics of these jobs and whether the characteristics fit a description of offshorability.

The use here of Occupational Information Network (O*Net) is in the spirit of Autor, Levy, and Murnane (2003), who explored the spread of computerization, using the Dictionary of Occupational Titles (DOT) to measure the routine vs. non-routine, and cognitive vs. non-cognitive aspects of occupations. The O*Net was developed by the U.S. Department of Labor as a replacement for the DOT.⁶ Similar in theme to the DOT as a source of occupational information, O*Net reflects the expanded possibilities of contemporary information technology in that it is a database, with information on job characteristics and worker attributes. Unlike the vast job-specific detail provided on 12,000+ occupations in the DOT, O*Net provides information on 1100+ occupations, using language and assessment common across jobs. Unlike DOT, where professional analysts were the primary source of information, job incumbents provide the information, gathered by survey questionnaire. Occupations are organized at the Standard Occupational Classification level.⁷ O*Net is used in a variety of fields studying work and occupations, such as organizational behavior, applied psychology, career assessment, human resource management and occupational psychology.⁸ O*Net is relatively foreign to research in economics. Blinder (2007) takes an approach similar in spirit to our discussion here.

⁴ This section borrows heavily from Jensen and Kletzer (2008).

⁵ See Bardhan and Kroll (2003) for a list of attributes.

⁶ See Peterson and Mumford, et., al., (1999) for a history of the development of O*Net.

⁷ Importantly, the level of SOC detail used in O*Net (6-digit plus) is deeper than the 6-digit SOC codes used in OES.

⁸ See <http://online.onetcenter.org/> for information on acquiring the data.

The O*Net Content model identifies the most important types of information about work, jobs and workers, and integrates the information into a structured system of six major categories:⁹

- Worker Characteristics (Abilities; Occupational Interests; Work Values; Work Styles)
- Worker Requirements (Skills & Knowledge; Education)
- Experience Requirements (Experience & Training; Skills & Entry Requirements; Licensing)
- Occupational Requirements (Generalized and Detailed Work Activities; Organizational Context; Work Context)
- Labor Market Characteristics (Labor Market Information; Occupational Outlook)
- Occupation-Specific Information (Tasks; Tools & Technology)

The first three categories (Worker Characteristics, Worker Requirements, Experience Requirements) are worker-oriented. The second three are work (or job) oriented categories, with Occupational Requirements as the focus of interest here. Occupational requirements are meant to identify requisite tasks, and are designed to cross occupations, at both a general and detailed level, while Occupation-specific Information is meant to be quite detailed and literally occupation-specific.

The domain/category “Occupational Requirements” is designed to provide “. . . a comprehensive set of variables or detailed elements that describe what various occupations require.” (National Center for O*Net Development, 2006, pg. 20) The focus is on typical activities required across occupations. Within the Generalized and Detailed Work Activities sub-domain, eleven measures to construct an index of offshorability/potential tradability:

On information content:

- Getting information (+)
- Processing information (+)
- Analyzing Data or Information (+)
- Documenting/Recording Information (+)

On Internet-enabled:

- Interacting with computers (+)

⁹ The idea behind the six content areas is to provide “multiple windows” on the world of work. Information on the O*Net Context Model comes from National Center for O*Net Development (2006). For a comprehensive discussion of O*Net from the practical and research perspectives, see Peterson and Mumford, *et., al.*, (2001).

On face-to-face contact:

- Assisting or Caring for Others (-)
- Performing or Working Directly with the Public (-)
- Establishing or Maintaining Interpersonal Relationships (-)

On working together or supervising the work of others:

- Communicating with supervisors, peers, subordinates (-)
- Training & Teaching others (-)
- Performing administrative duties (-)
- Coordinating work and activities of others (-)

On the “on-site” nature of work:

- Inspecting equipment, structures or material (-)
- Monitoring processes, materials and/or surroundings (-)

The sign in parentheses [(+) or (-)] denotes a prior on whether the characteristic is positively related to offshorability or negatively related.

Rating scales are used to quantify these characteristics. Multiple scales are provided, with “importance” and “level” as the predominant pair. “Importance” is the rating of answers to the question: “How important is this skill to performance on the job?” Answers vary from “not important” to “extremely important,” on a scale of 1 to 5. “Level” is the rating of “What level of this skill is needed to perform this job?,” ranging from low (level) to high (level), on a scale of 1 to 7.¹⁰ An illustration might be useful, normalizing the two different scale ranges to 0 to 100. For the attribute “Performing or Working Directly with the Public,” data entry keyers are assigned importance (I) =43, and level (L) = 33. For Security Guards, I=74 and L=62. Compared to data entry keyers, working with the public is more important to performance on the job for security guards, along with a higher level of the “skill” of working with the public. See Jensen and Kletzer (2008) for a more complete description of the rating scheme and a presentation of summary statistics on the work activities.

The composite index of offshorability is the weighted sum of the 14 components, using priors on the sign of the attribute in regard to offshoring potential. Higher values of the index indicate more offshorability potential, yielding a ranking of all occupations for which the

¹⁰ See Peterson and Mumford. *et., al.*, (1999, 2001). Level allows a “not relevant to performance” rating, coded as 0.

attributes are available.¹¹ The usefulness of the index is ordinal, not cardinal. Occupations are judged on their offshorability relative to each other, not compared to some absolute standard. Tables 1 and 2 report the top-30 and bottom-30 occupations.¹² Occupations at the top of the list seem unsurprising: credit authorizers, data entry keyers, accountants, medical transcriptionists, market research analysts, bookkeeping and account clerks.

Tables 1 and 2 list employment and median annual earnings for each occupation, for May 2003 and May 2008, obtained from the Occupational Employment Statistics program (OES). The OES program, operated by the U.S. Bureau of Labor Statistics (BLS) generates employment and earnings estimates for over 800 detailed occupations, derived from a semi-annual mail survey of establishments. Although the OES survey methodology is designed to create detailed cross-sectional employment and wage estimates for the U.S. and smaller geographic units, across and by industry, it is less useful for comparisons of two or more points in time. Changes in the procedures for collecting data, along with changes in occupational and industry codes may it complicated to create a time-series. A great deal of detail must be suppressed to create a consistent time series, as noted by Dey (conference paper) and Abraham (conference paper). Dey, Houseman and Polivka (2007) create a time series for 15-18 broad occupational aggregates (at the major occupation level) and 6 narrow occupational groups. This level of aggregation loses the movability characteristics available from O*Net. For this paper's preliminary analysis, changes in employment and earnings are considered at just two data points, May 2003 and May 2008.¹³

To date, I have located three other analyses that order occupations by an assessment of offshorability. Consistent with its organizational interest in occupational growth projections, the Bureau of Labor Statistics has developed a list of 40 detailed occupations deemed "susceptible to a significant risk of offshoring," (United States Department of Labor, 2006, pg. 12). Of these 40 occupations, 39 are services occupations (the exception is aircraft mechanics and service technicians). With varying degree of "fit," 38 of these 39 occupations are noted for their

¹¹ In constructing an index, it is not obvious how to weight importance and level. Starting from the observation that importance varies more than level across occupations, an index was created using a weight of three-quarters to importance and one-quarter to level. The ranking is robust to different weights.

¹² The full listing of 799 occupations, ranked by job task content, takes up 28 printed pages, and is available upon request.

¹³ See Jensen and Kletzer (2008) and Kletzer (2009) for two slightly different presentations of a "top 20" and "bottom 20" of offshorable jobs.

offshorability by the index reported here. Graphic designers and switchboard operators are included in the BLS list, with my index ranking these two occupations close to the middle of the 457. All the rest of the BLS occupations are fairly highly ranked by my index. The BLS list is not ranked; it is simply offered as a list of susceptible occupations, presumably with some more susceptible than others.¹⁴

Moncarz, Wolf and Wright (2008) present a more comprehensive analysis of offshoring and occupations, from work performed for the BLS Employment Projections Program. Starting with 515 service-providing occupations, BLS economists who study occupations identified those occupations, “that had insurmountable barriers to offshoring.” (pg. 73).¹⁵ After eliminating occupations “considered not at all susceptible (to offshoring)” (pg. 73), the analysis was confined to 160 occupations. The analysts considered four characteristics: inputs and outputs that can travel easily across long distances (such as electronically); work that requires little interaction with other types of workers; work that requires little knowledge of the social or cultural idiosyncrasies of the target market; and work that is routine in nature (pg. 73). Occupations were scored on this characteristics (very low to very high, a 4 point scale), and assigned a susceptibility score. A preliminary comparison of the resulting ranking suggests considerable difference between the BLS analysis and the analysis reported here.

Blinder (2007) explores a subjective index based on two characteristics: 1) can the work be delivered to a remote location; and 2) must the job be performed at a specific (US) location. In his subjective measure, Blinder concentrates on one characteristic of the delivery of services, the separation of customer and supplier that he labels “impersonally-delivered services.” Basically, impersonally-delivered services can be delivered electronically, incorporating the vast improvement in ICT. His measure does not incorporate any attributes related to the kind of work sent down the wire, such as information context or internet enabling. Most importantly, in terms of the area of traditional US comparative advantage, Blinder does not consider the creativity or routineness of work.¹⁶ In an area that needs more exploration, there are many high-skill and

¹⁴ The BLS methodology is similar in spirit to ours, considering characteristics of digital transmission, repetitive tasks, little face-to-face interaction. Occupational analysts provided judgments on these characteristics. Further refinements included excluding occupations where technology or automation could account for a dampening of employment growth. See US Department of Labor, 2006.

¹⁵ Examples include physical therapists and barbers, security guards, correctional officers.

¹⁶ The routineness of work, or the codification of tasks, is a characteristic emphasized by Autor, Levy, and Murnane (2003).

high-value (creative) services, that while transmittable electronically, pose opportunities for American workers and firms to penetrate foreign markets.

Using both production and non-production occupations, Blinder estimates that 30 to 40 million workers are currently in potentially tradable jobs, based on May 2005 employment levels. Objective measures may well be preferred, given the number of occupations (>450) and desire for replication.

3. Rising services trade and shifts in the occupational distribution of employment

Taking up the approach followed in National Academy of Public Administration (NAPA, 2006b), this section begins to examine shifts in the occupational distribution of employment within service sector industries where imports (trade) have expanded. The idea is to look for evidence consistent with offshoring, within industries where services trade has expanded:¹⁷ do high potential mobility occupations decline (relative to national trends) in industries coincident with rising imports?; how does the occupational employment share, within a “rising import” industry relate to potential mobility?

The NAPA (2006b) examined a limited set of industries that were, “significant in size, potentially vulnerable to off-shoring, sufficiently diverse, well integrated into the overall economy, and likely to continue expanding.” Four industries were selected:

- pharmaceutical and medicine manufacturing [3254]
- architectural, engineering, and related services [5413]
- computer systems design and related services [5415], and
- business support services [5614]

The NAPA analysis developed more, and more extensive, measures of offshoring than tackled here (to date). The approach here is in the spirit of NAPA’s analysis, of considering service industries with a high-tech component with increasing trade flows, yet with a considerably larger set of detailed industries. Appendix table A reports changes in occupational employment, within 6-digit NAICS industries and across industries, for NAICS sectors 51 (Information), 54 (Professional, Scientific and Technical Services) and 56 (Administrative and Support

¹⁷ This framing ignores the question of whether the appropriate “trade” measure is the level of trade or the change.

Services).¹⁸

Before turning to the occupational employment data, Chart 1 shows the rise in trade in the overall category of “Other Private Services,” where these NAICS sectors reside. There is a trade surplus in this category that has grown since the early 2000s. Table 3 presents more detailed trade data, for the period 2002 to 2007, for a subset of “Other Private Services” that includes a number of the industries examined here. The services trade surplus is broadly in evidence, although it is also clear that imports have increased substantially.

Returning to Appendix table A, for each industry, the subset of occupations charted starts with the “Ten largest occupations for each industry” featured on the BLS website, drawn from the May 2008 OES.¹⁹ Given the difficulties of using the OES data as a time-series, and the desire to examine very detailed occupations, the analysis to date compares just two points in time, May 2003 and May 2008.

The table is sufficiently detailed to make summary statistics complicated. Offering the most summary of summary statistics, the movability index is negatively correlated with changes in the share of industry employment accounted for by an occupation (if an occupation’s share of industry employment rose from 2003 to 2008, that occupation was lower-ranked in terms of potential movability).²⁰ NAICS sectors 54 (Professional, Scientific and Technical Services) and 56 (Administrative and Support Services) grew strongly over the 2003-08 period, with the exception of Legal Services (5411) and Employment Services (5613). Employment in these sectors grew faster than the national average, and within industry, across the most populous occupations.

Customer services representatives have received some attention in discussions of potential offshoring. The movability index ranks the occupation at 161 (of 799). In Professional, Scientific and Technical Services, employment growth for this job was less than the national average. Yet in sector 56 (Administrative and Support Services) employment growth was faster than the national average. These sectors do not include telemarketers as a top 10 occupation, with the exception of Business Support Services (NAICS 5614), where employment grew, in contrast to the decline at the national level.

¹⁸ NAICS sector 56 also includes Waste Management and Remediation Services, but those detailed industries are not included here.

¹⁹ Available at <<http://stats.bls.gov/oes/>>, most recently accessed on 10/26/09.

²⁰ Correlation = -.25 for sectors 54 and 56.

4. Conclusions

This paper begins to offer a research perspective on offshoring that builds more solidly from the domestic outsourcing literature than is the case for the current state of the offshoring literature. In my view, offshoring work to date has deeper roots in “trade,” that is offshore activity, than in outsourcing (the decision to buy instead of make). From the perspective of understanding structural change at the industry level, offshore outsourcing may be usefully studied in the broader context of domestic outsourcing. Domestic outsourcing is larger and may possibly be a precursor to offshore outsourcing. Offshore outsourcing offers additional concerns arising from distance, culture and language, beyond the industrial relations and labor market responses noted in domestic outsourcing.

Studies of outsourcing, whether domestic or offshore, are clearly hampered by the lack of time-series occupational data. Aggregating detailed occupational measures, to create a useable time series, loses the job task detail essential to studying potential movability. Preliminary analysis of how these occupations have changed in importance, measured as by employment share and earnings change, is ongoing. A natural question arises as to whether business, professional and technical services industries with rising imports show evidence of shifts in occupational employment that are consistent with offshoring.

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**Chart 1:
Services Exports and Imports, 1992-2008**

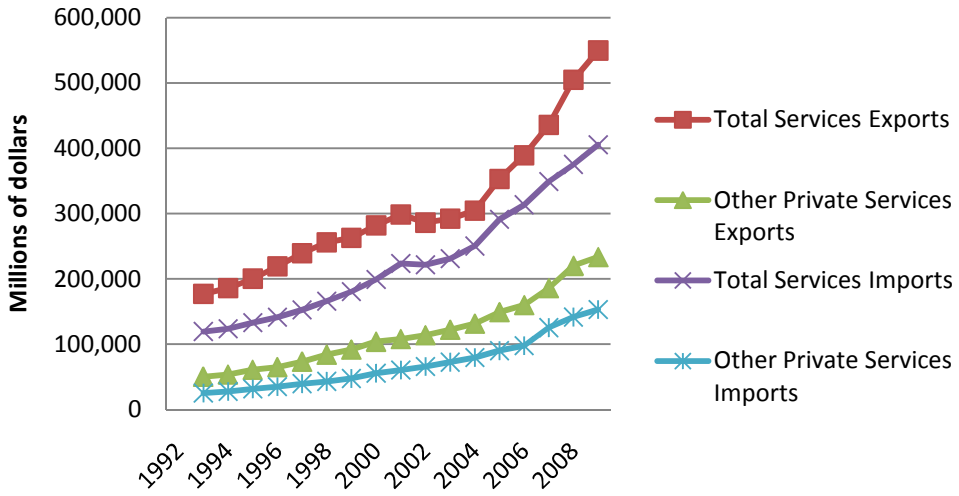


Table 1: Top 30 occupations for potential movability

SOC code	Occupation title	Movability		May 2008		May 2003		Change, 2003 - 2008	
		Index	Rank	Employment	Median annual earnings	Employment	Median annual earnings	Employment	Real median earnings
15-2091	Mathematical technicians	1.274	1	1,100	\$38,400	2,180	\$36,540	-0.495	-0.102
15-2021	Mathematicians	0.118	2	2,770	\$95,150	2,470	\$78,290	0.121	0.039
17-3013	Mechanical drafters	-0.171	3	77,070	\$46,640	74,010	\$41,520	0.041	-0.040
13-2041	Credit analysts	-0.173	4	74,400	\$55,250	68,910	\$45,020	0.080	0.049
15-2031	Operations research analysts	-0.289	5	60,860	\$69,000	58,080	\$58,300	0.048	0.012
19-2011	Astronomers	-0.358	6	1,280	\$101,300	770	\$88,310	0.662	-0.020
15-2041	Statisticians	-0.391	7	20,680	\$72,610	18,370	\$59,560	0.126	0.042
17-3012	Electrical and electronics drafters	-0.395	8	32,710	\$51,320	33,720	\$41,730	-0.030	0.051
15-1051	Computer systems analysts	-0.443	9	489,890	\$75,500	474,780	\$64,160	0.032	0.006
19-3011	Economists Market research	-0.454	10	12,600	\$83,590	12,300	\$70,250	0.024	0.017
19-3021	analysts	-0.457	11	230,070	\$61,070	142,190	\$54,670	0.618	-0.045
15-2011	Actuaries	-0.486	13	18,220	\$84,810	14,680	\$72,520	0.241	0.000
15-1031	Computer software engineers, applications	-0.506	14	494,160	\$85,430	392,140	\$72,530	0.260	0.007
17-2072	Electronics engineers, except computer	-0.539	15	139,930	\$86,370	137,320	\$71,370	0.019	0.034
13-2031	Budget analysts Database	-0.564	16	62,630	\$65,320	55,560	\$54,520	0.127	0.024
15-1061	administrators	-0.571	17	115,770	\$69,740	100,890	\$58,200	0.147	0.024
13-2011	Accountants and auditors	-0.577	18	1,133,580	\$59,430	924,640	\$49,060	0.226	0.035
43-9021	Data entry keyers	-0.644	19	272,810	\$26,120	339,010	\$22,600	-0.195	-0.012
13-2052	Personal financial advisors	-0.668	20	146,690	\$69,050	85,670	\$58,700	0.712	0.005
23-2093	Title examiners, abstractors, and searchers	-0.669	21	59,390	\$38,300	47,840	\$34,080	0.241	-0.039
17-2071	Electrical engineers	-0.671	22	154,670	\$82,160	146,150	\$69,640	0.058	0.008
31-9094	Medical transcriptionists	-0.677	23	86,200	\$32,060	97,810	\$27,590	-0.119	-0.007
17-2011	Aerospace engineers	-0.679	24	67,800	\$92,520	70,740	\$74,520	-0.042	0.061
17-1021	Cartographers and photogrammetrists	-0.741	25	11,690	\$51,180	8,940	\$44,170	0.308	-0.010
19-3041	Sociologists	-0.754	26	4,390	\$68,570	3,060	\$54,410	0.435	0.077
43-9111	Statistical assistants	-0.760	27	16,900	\$34,850	20,970	\$29,890	-0.194	-0.003
43-3031	Bookkeeping, accounting, and auditing clerks	-0.763	28	1,855,010	\$32,510	1,750,680	\$27,760	0.060	0.001
15-1011	Computer and information scientists, research	-0.785	29	26,610	\$97,970	23,210	\$81,600	0.146	0.026
13-2051	Financial analysts	-0.833	30	236,720	\$73,150	165,420	\$60,050	0.431	0.041

Table 2: Top 30 occupations for potential movability

SOC code	Occupation title	Movability		May 2008		May 2003		Change, 2003 -2008	
		Index	Rank	Employment	Median annual earnings	Employment	Median annual earnings	Employment	Real median earnings
31-9091	Dental assistants	-3.228	768	293,090	\$32,380	272,030	\$27,700	0.077	-0.001
53-6021	Parking lot attendants	-3.241	769	136,470	\$18,790	113,490	\$16,630	0.202	-0.034
29-1061	Anesthesiologists	-3.247	770	34,230	#	23,790	#	0.439	
39-5093	Shampooers	-3.257	771	15,570	\$17,300	15,300	\$14,360	0.018	0.030
29-1081	Podiatrists	-3.272	772	9,670	\$113,560	7,800	\$94,060	0.240	0.032
47-5061	Roof bolters, mining	-3.284	773	4,950	\$45,210	3,980	\$38,550	0.244	0.002
25-2011	Preschool teachers, except special education	-3.288	774	392,170	\$23,870	368,870	\$19,820	0.063	0.029
27-2032	Choreographers	-3.301	775	13,860	\$38,520	14,810	\$31,030	-0.064	0.061
29-9091	Athletic trainers	-3.316	777	15,070	\$39,640	11,750	\$32,850	0.283	0.031
29-2055	Surgical technologists	-3.317	778	89,600	\$38,740	73,250	\$32,130	0.223	0.031
53-3011	Ambulance drivers and attendants, except emergency medical technicians	-3.324	779	21,790	\$22,410	17,650	\$19,000	0.235	0.008
33-9032	Security guards	-3.334	780	1,046,760	\$23,460	964,260	\$19,660	0.086	0.020
39-1021	First-line supervisors/managers of personal service workers	-3.340	781	129,070	\$34,910	110,630	\$29,500	0.167	0.011
21-2011	Clergy	-3.351	782	42,040	\$41,730	38,170	\$33,800	0.101	0.055
27-2021	Athletes and sports competitors	-3.362	783	13,960	\$40,480	11,840	\$45,780	0.179	-0.244
39-3091	Amusement and recreation attendants	-3.366	784	258,820	\$17,470	236,070	\$15,030	0.096	-0.007
31-9011	Massage therapists	-3.379	785	51,250	\$34,900	29,940	\$28,670	0.712	0.040
39-3011	Gaming dealers	-3.381	786	91,130	\$16,310	76,120	\$14,200	0.197	-0.018
49-9051	Electrical power-line installers and repairers	-3.427	787	111,580	\$55,100	95,190	\$48,960	0.172	-0.038
47-2022	Stonemasons	-3.446	788	18,910	\$37,800	13,710	\$34,000	0.379	-0.050
47-4091	Segmental pavers	-3.480	789	1,170	\$27,400	1,710	\$26,530	-0.316	-0.117
27-2041	Music directors and composers	-3.488	790	9,120	\$41,270	9,000	\$32,530	0.013	0.084
37-3013	Tree trimmers and pruners	-3.497	791	35,420	\$29,970	40,710	\$25,630	-0.130	-0.001
11-9031	Education administrators, preschool and child care center/program	-3.528	792	49,630	\$39,940	56,030	\$34,500	-0.114	-0.011
29-2054	Respiratory therapy technicians	-3.533	793	16,210	\$42,430	25,470	\$34,850	-0.364	0.041
39-6031	Flight attendants	-3.609	794	99,480	\$35,930	107,100	***	-0.071	
39-9031	Fitness trainers and aerobics instructors	-3.623	796	229,030	\$29,210	177,790	\$24,510	0.288	0.019
33-1021	First-line supervisors/managers of fire fighting and prevention workers	-3.680	797	53,300	\$67,440	59,000	\$57,000	-0.097	0.011
27-2022	Coaches and scouts	-3.844	798	175,720	\$28,340	105,070	\$26,950	0.672	-0.101
49-9095	Manufactured building and mobile home installers	-4.131	799	8,290	\$28,250	13,160	\$23,360	-0.370	0.034

Table 3: International Trade in Business, Professional and Technical Services (millions of dollars)

	2002	2003	2004	2005	2006	2007
Total						
Imports	34185	37458	40992	46924	61068	68763
Exports	60177	62958	69568	76487	89692	107675
Advertising						
Imports	786	864	931	876	1845	1977
Exports	466	517	581	896	3163	4030
Computer and Information Services						
Imports	6495	7617	8639	10596	13085	14815
Exports	7079	8213	8693	9434	10341	12798
Research, Development and Testing Services						
Imports	4063	5071	5778	7239	9429	11437
Exports	8678	9467	9563	10431	12821	14698
Management Consulting and Public Relations Services						
Imports	11028	10770	12076	14905	19361	20475
Exports	14339	14309	16372	19242	22058	24699
Legal Services						
Imports	820	874	899	894	1222	1561
Exports	3099	3377	3997	4225	5294	6424
Construction, Architectural and Engineering Services						
Imports	316	303	580	434	1751	1851
Exports	2247	2564	3294	3791	5369	6469
Industrial Engineering						
Imports	183	176	164	169	1035	1504
Exports	806	877	828	2303	3836	3872
Installation, Maintenance and Repair of Equipment						
Imports	668	670	720	956	3780	4180
Exports	5287	4995	4948	6494	7667	8966
Operational Leasing						
Imports	1060	841	1142	1316	1161	1046
Exports	7552	8062	8634	9555	10389	11664
Other (1)						
Imports	8768	10267	9994	9538	7880	9917
Exports	10622	10575	12656	10116	8754	14124

(1) Other includes accounting, auditing, and bookkeeping services; medical services; mining services; sports and performing arts; trade-related services; training services.

Source: Bureau of Economic Analysis, U.S. International Services Cross-Border Trade
 Accessed at: <http://www.bea.gov/international/intlserv.htm>

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC	Within NAICS employment change, 2003-2008	Change in share of NAICS employment	National-level employment change	Movability index ranking
			(1)	(2)	(3)	(4)	(5)
Legal Services	541100	All	00-0000	0.032		0.060	
		Lawyers	23-1011	0.046	0.004	0.073	180
		Paralegals and legal assistants	23-2011	0.226	0.025	0.224	41
		Title examiners, abstractors, and searchers	23-2093	0.580	0.008	0.241	21
		Bookkeeping, accounting, and auditing clerks	43-3031	-0.015	-0.001	0.060	28
		File clerks	43-4071	0.099	0.001	-0.179	186
		Receptionists and information clerks	43-4171	0.077	0.001	0.037	208
		Executive secretaries and administrative assistants	43-6011	-0.264	-0.007	0.051	293
		Legal Secretaries	43-6012	-0.023	-0.011	-0.024	148
		Secretaries, except legal, medical, and executive	43-6014	-0.290	-0.017	0.014	273
		Office clerks, general	43-9061	0.031	0.000	-0.007	209
Accounting & Bookkeeping Services	541200	All	00-0000	0.113		0.060	
	541200	Accountants and auditors	13-2011	0.279	0.042	0.226	40
	541200	Tax preparers	13-2082	0.279	0.009	0.250	70
		First-line supervisors/managers of office and administrative support workers	43-1011	-0.063	-0.004	-0.006	556
	541200	Bill and account collectors	43-3011	1.114	0.010	-0.020	118
	541200	Billing and posting clerks and machine operators	43-3021	0.486	0.011	0.051	45
	541200	Bookkeeping, accounting, and auditing clerks	43-3031	0.154	0.004	0.060	28
	541200	Payroll and timekeeping clerks	43-3051	2.208	0.018	0.046	34
	541200	Executive secretaries and administrative assistants	43-6011	0.164	0.001	0.051	293
	541200	Secretaries, except legal, medical, and executive	43-6014	-0.001	-0.004	0.014	273
	541200	Office clerks, general	43-9061	0.029	-0.004	-0.007	209

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC	Within NAICS employment change, 2003-2008	Change in share of NAICS employment	National-level employment change	Movability index ranking
			(1)	(2)	(3)	(4)	(5)
Architectural & Engineering Services	541300	All	00-0000	0.172		0.060	
	541300	Engineering managers	11-9041	0.100	-0.002	-0.065	228
	541300	Architects, except landscape and naval	17-1011	0.267	0.005	0.220	258
	541300	Surveyors	17-1022	0.091	-0.002	0.083	261
	541300	Civil engineers	17-2051	0.356	0.013	0.267	363
	541300	Mechanical engineers	17-2141	0.371	0.005	0.124	93
	541300	Architectural and civil drafters	17-3011	0.276	0.005	0.175	104
	541300	Civil engineering technicians	17-3022	0.124	-0.001	-0.021	55
	541300	Surveying and mapping technicians	17-3031	0.337	0.004	0.246	67
	541300	Executive secretaries and administrative assistants	43-6011	0.350	0.004	0.051	293
541300	Office clerks, general	43-9061	0.208	0.001	-0.007	209	
Specialized Design Services	541400	All	00-0000	0.195	.	0.060	.
	541400	General and operations managers	11-1021	-0.081	-0.007	-0.103	650
	541400	Art directors	27-1011	0.178	0.000	0.403	131
	541400	Commercial and industrial designers	27-1021	0.394	0.003	-0.013	125
	541400	Graphic designers	27-1024	0.273	0.013	0.377	103
	541400	Interior designers	27-1025	0.541	0.034	0.152	326
	541400	Sales representatives, services, all other	41-3099	0.507	0.006	0.617	150
	541400	Bookkeeping, accounting, and auditing clerks	43-3031	0.077	-0.003	0.060	28
	541400	Executive secretaries and administrative assistants	43-6011	0.251	0.001	0.051	293
	541400	Secretaries, except legal, medical and executive	43-6014	0.384	0.003	0.014	273
541400	Office clerks, general	43-9061	0.216	0.001	-0.007	209	
Computer Systems Design & Related Services	541500	All	00-0000	0.284		0.060	.
	541500	Computer and information systems managers	11-3021	0.355	0.002	0.041	301
	541500	Management analysts	13-1111	0.404	0.002	0.264	223

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
	541500	Computer programmers	15-1021	0.268	-0.001	-0.087	59
	541500	Computer software engineers, applications	15-1031	0.325	0.004	0.260	14
	541500	Computer software engineers, systems software	15-1032	0.321	0.002	0.336	64
	541500	Computer support specialists	15-1041	0.212	-0.004	0.129	157
	541500	Computer systems analysts Network and computer systems administrators	15-1051	0.462	0.011	0.032	9
	541500	Network systems and data communications analysts	15-1071	0.280	0.000	0.378	87
	541500	15-1081	15-1081	0.461	0.003	0.557	348
	541500	Customer service representatives	43-4051	-0.016	-0.007	0.174	161
Management & Technical Consulting Services	541600	All	00-0000	0.292	.	0.060	.
	541600	General and operations managers	11-1021	0.119	-0.005	-0.103	650
	541600	Management analysts Business operations specialists, all other	13-1111	0.534	-0.001	0.264	223
	541600	13-1199	13-1199	0.897	0.011	0.216	225
	541600	Market research analysts Sales representatives, services, all other	19-3021	0.791	0.008	0.618	11
	541600	41-3099	41-3099	0.929	0.008	0.617	150
	541600	Bookkeeping, accounting, and auditing clerks	43-3031	0.184	-0.003	0.060	28
	541600	Customer service representatives Executive secretaries and admin. Assistants	43-4051	0.041	-0.001	0.174	161
	541600	43-6011	43-6011	0.334	-0.001	0.051	293
	541600	Secretaries, except legal, medical, and executive	43-6014	0.281	-0.006	0.014	273
	541600	Office clerks, general	43-9061	0.142	-0.015	-0.007	209
Office administrative services	561100	All	00-0000	0.338	0.000	.	.
	561100	General and operations managers	11-1021	0.446	0.004	-0.103	650
	561100	Management analysts	13-1111	0.195	-0.004	0.264	223
	561100	Accountants and auditors	13-2011	0.855	0.011	0.226	40

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
	561100	First-line supervisors/managers of office and administrative support workers	43-1011	0.551	0.005	-0.006	556
	561100	Billing and posting clerks and machine operators	43-3021	0.529	0.003	0.051	37
	561100	Bookkeeping, accounting, and auditing clerks	43-3031	0.652	0.010	0.060	28
	561100	Customer service representatives	43-4051	0.950	0.022	0.174	161
	561100	Executive secretaries and administrative assistants	43-6011	0.350	0.000	0.051	293
	561100	Secretaries, except legal, medical, and executive	43-6014	0.753	0.007	0.014	273
	561100	Office clerks, general	43-9061	0.317	-0.001	-0.007	209
Employment Services	561300	All	00-0000	0.033	0.000	0.060	
	561300	Employment, recruitment, and placement specialists	13-1071	1.110	0.013	0.255	440
	561300	Registered nurses	29-1111	0.307	0.006	0.132	741
	561300	Customer service representatives	43-4051	0.471	0.009	0.174	161
	561300	Executive secretaries and administrative assistants	43-6011	0.109	0.001	0.051	293
	561300	Office clerks, general	43-9061	0.033	0.000	-0.007	209
	561300	Construction laborers	47-2061	0.687	0.012	0.218	567
	561300	Team assemblers	51-2092	1.613	0.031	-0.006	405
	561300	Helpers-production workers	51-9198	0.531	0.012	0.104	249
	561300	Laborers and freight, stock, and material movers, hand	53-7062	-0.189	-0.031	0.035	575
	561300	Packers and packagers, hand	53-7064	-0.048	-0.003	-0.138	585
Business Support Services	561400	All	00-0000	0.113	0.000	0.060	
	561400	General and operations managers	11-1021	-0.030	-0.003	-0.103	650
	561400	Medical transcriptionists	31-9094	0.094	0.000	-0.119	23
	561400	Telemarketers	41-9041	0.101	-0.002	-0.146	42
	561400	First-line supervisors/managers of office and administrative support workers	43-1011	0.206	0.003	-0.006	556
	561400	Switchboard operators, including answering service	43-2011	-0.221	-0.010	-0.293	233

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC	Within NAICS employment change, 2003-2008	Change in share of NAICS employment	National-level employment change	Movability index ranking
			(1)	(2)	(3)	(4)	(5)
	561400	Bill and account collectors	43-3011	0.316	0.020	-0.020	118
	561400	Customer service representatives	43-4051	0.517	0.055	0.174	161
		Mail clerks and mail machine					
	561400	operators, except postal service	43-9051	0.244	0.002	-0.099	213
	561400	Office clerks, general	43-9061	0.011	-0.003	-0.007	209
		Office machine operators, except					
	561400	computer	43-9071	0.088	-0.001	-0.122	537
Newspaper, book & directory publishers							
	511100	All	00-0000	-0.092	0.000	0.060	.
	511100	General and operations managers	11-1021	-0.103	0.000	-0.103	650
	511100	Graphic designers	27-1021	0.408	0.016	-0.013	125
	511100	Reporters and correspondents	27-3022	-0.036	0.003	-0.035	40
	511100	Editors	27-3041	0.051	0.014	0.009	147
	511100	Advertising sales agents	41-3011	0.137	0.017	0.143	251
		Sales representatives, wholesale and					
		manufacturing, except technical and					
	511100	scientific products	41-4012	-0.170	-0.002	0.051	231
	511100	Customer service representatives	43-4051	-0.143	-0.002	0.174	161
		Mail clerks and mail machine					
	511100	operators, except postal service	43-9051	0.239	0.006	-0.099	213
	511100	Office clerks, general	43-9061	-0.112	-0.001	-0.007	209
	511100	Printing machine operators	51-5023	0.016	0.003	0.019	145
Software Publishers							
	511200	All	00-0000	0.074	0.000	0.060	.
		Computer and information systems					
	511200	managers	11-3021	0.095	0.001	0.041	301
	511200	Computer programmers	15-1021	-0.015	-0.006	-0.087	59
		Computer software engineers,					
		applications					
	511200	Computer software engineers, systems	15-1031	-0.067	-0.022	0.160	14
		software					
	511200	software	15-1032	0.343	0.020	0.336	64
	511200	Computer support specialists	15-1041	-0.100	-0.014	0.129	157
	511200	Computer systems analysts	15-1051	0.342	0.009	0.032	9
		Network and computer systems					
	511200	administrators	15-1071	0.493	0.007	0.378	65
	511200	Computer specialists, all other	15-1099	.	0.026	0.470	40

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
		Sales representatives, wholesale and manufacturing, technical and scientific products	41-4011	0.386	0.009	0.064	149
		Customer service representatives	43-4051	0.312	0.005	0.174	161
Motion picture & video industries		All	00-0000	0.019	0.000	0.060	.
		General and operations managers	11-1021	-0.161	-0.005	-0.103	650
		Multi-media artists and animators	27-1014	0.574	0.009	-0.043	122
		Actors	27-2011	-0.622	-0.051	-0.144	640
		Producers and directors	27-2012	1.005	0.032	0.436	415
		Film and video editors	27-4032	0.245	0.006	0.240	257
		Counter attendants, cafeteria, food concession, and coffee shop	35-3022	0.017	0.000	0.143	521
		Motion picture projectionists	39-3021	0.165	0.003	-0.024	518
		Ushers, lobby attendants, and ticket takers	39-3031	-0.066	-0.009	-0.025	451
		Cashiers	41-2011	0.001	-0.001	0.024	396
		Executive secretaries and administrative assistants	43-6011	-0.022	-0.001	0.051	293
Sound recording industries		All	00-0000	-0.229	0.000	0.060	.
		General and operations managers	11-1021	-0.081	0.006	-0.103	650
		Producers and directors	27-2012	0.622	0.019	0.436	415
		Audio and video equipment technicians	27-4011	-0.017	0.006	0.210	420
		Sound engineering technicians	27-4014	1.238	0.116	0.402	252
		Sales representatives, services, all other	41-3099	0.645	0.013	0.617	175
		Sales representatives, wholesale and manufacturing, except technical and scientific products	41-4012	-0.273	-0.002	0.051	231
		Bookkeeping, accounting, and auditing clerks	43-3031	1.000	0.028	0.060	28
		Executive secretaries and administrative assistants	43-6011	0.000	0.008	0.051	293

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Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
		Secretaries, except legal, medical and					
	512200	executive	43-6014	0.000	0.008	0.014	273
	512200	Office clerks, general	43-9061	0.000	0.012	-0.007	209
Radio & Television Broadcasting							
	515100	All	00-0000	-0.016	0.000	0.060	.
	515100	General and operations managers	11-1021	-0.125	-0.003	-0.103	650
	515100	Producers and directors	27-2012	0.285	0.021	0.436	415
	515100	Radio and television announcers	27-3011	-0.105	-0.014	-0.100	204
	515100	Broadcast news analysts	27-3021	-0.014	0.000	-0.089	163
	515100	Reporters and correspondents	27-3022	-0.046	-0.001	-0.035	40
	515100	Broadcast technicians	27-4012	0.066	0.008	0.024	214
		Camera operators, television, video, and motion picture	27-4031	-0.215	-0.008	-0.101	439
	515100	Advertising sales agents	41-3011	0.023	0.005	0.143	251
		Executive secretaries and administrative assistants	43-6011	0.071	0.001	0.051	293
	515100	Office clerks, general	43-9061	0.151	0.004	-0.007	209
Cable & Other subscription programming							
	515200	All	00-0000	-0.074	0.000	0.060	.
	515200	Producers and directors	27-2012	0.275	0.021	0.436	415
		Audio and video equipment technicians	27-4011	0.860	0.010	0.210	420
	515200	Broadcast technicians	27-4012	0.635	0.013	0.024	214
	515200	Advertising sales agents	41-3011	0.429	0.008	0.143	251
		Sales representatives, services, all other	41-3099	0.206	0.009	0.617	175
	515200	Customer service representatives	43-4051	-0.443	-0.060	0.174	161
		Executive secretaries and administrative assistants	43-6011	0.207	0.005	0.051	293
		First-line supervisors/managers of mechanics, installers, and repairers Telecommunications equipment installers and repairers, except line installers	49-1011	-0.126	-0.001	-0.004	760
	515200		49-2022	0.546	0.032	-0.002	359

Appendix Table A: Top 10 occupations (by employment), by industry, 2003 and 2008

Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
Wired telecommunications carriers	515200	Telecommunications line installers and repairers	49-9052	-0.016	0.008	0.135	523
	517100	All	00-0000	0.133	0.000	0.060	.
	517100	Business operations specialists, all other	13-1199	0.259	0.002	0.216	225
	517100	Network and computer system administrators	15-1071	0.981	0.010	0.378	65
	517100	Network systems and data communications analysts	15-1081	4.900	0.028	0.557	348
	517100	Electronics engineers, except computer	17-2072	-0.038	-0.004	0.019	15
	517100	Sales representatives, services, all other	41-3099	0.471	0.014	0.617	175
	517100	Telephone operators	43-2021	-0.331	-0.014	-0.496	108
	517100	Customer service representatives	43-4051	0.260	0.010	0.174	161
	Wireless telecommunications carriers	517100	First-line supervisors/managers of mechanics, installers, and repairers	49-1011	0.038	-0.002	-0.004
517100		Telecommunications equipment installers and repairers, except line installers	49-2022	0.097	-0.005	-0.002	359
517100		Telecommunications line installers and repairers	49-9052	1.118	0.062	0.135	523
517200		All	00-0000	0.029	0.000	0.060	.
517200		Business operations specialists, all other	13-1199	0.799	0.008	0.216	225
517200		Computer support specialists	15-1041	0.700	0.007	0.129	157
517200		Network systems and data communications analysts	15-1081	-0.049	-0.001	0.557	348
517200		Electronics engineers, except computer	17-2072	0.340	0.006	0.019	15
517200		First-line supervisors/managers of retail sales workers	41-1011	0.451	0.011	0.009	739
517200		Retail salespersons	41-2031	1.138	0.088	0.109	460

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Industry	NAICS	Occupation	SOC	Within NAICS employment change, 2003-2008	Change in share of NAICS employment	National-level employment change	Movability index ranking
			(1)	(2)	(3)	(4)	(5)
	517200	Sales representatives, services, all other	41-3099	0.235	0.012	0.617	175
	517200	First-line supervisors/managers of office and administrative support workers	43-1011	-0.224	-0.007	-0.006	556
	517200	Customer service representatives	43-4051	0.387	0.066	0.174	161
	517200	Telecommunications equipment installers and repairers, except line installers	49-2022	-0.022	-0.002	-0.002	359
Satellite telecommunications	517400	All	00-0000	-0.259	0.000	0.060	.
	517400	Business operations specialists, all other	13-1199	1.071	0.015	0.216	225
	517400	Network systems and data communications analysts	15-1081	9.750	0.033	0.557	348
	517400	Electronics engineers, except computer	17-2072	0.933	0.015	0.019	15
	517400	Sales representatives, services, all other	41-3099	0.061	0.025	0.617	175
	517400	Telemarketers	41-9041	0.144	0.029	-0.146	42
	517400	Customer service representatives	43-4051	-0.356	-0.016	0.174	161
	517400	Order clerks	43-4151	-0.500	-0.019	-0.182	80
	517400	Telecommunications equipment installers and repairers, except line installers	49-2022	-0.663	-0.033	-0.002	359
	517400	Electrical and electronics repairers, commercial and industrial equipment	49-2094	1.583	0.018	-0.078	325
	517400	Telecommunications line installers and repairers	49-9052	-0.229	0.002	0.135	523
Other telecommunications	517900	All	00-0000	18.831	0.000	0.060	.
	517900	Business operations specialists, all other	13-1199	93.500	0.021	0.216	225
	517900	Computer support specialists	15-1041	80.250	0.017	0.129	157
	517900	Network systems and data communications analysts	15-1081	58.333	0.017	0.557	348

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Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
		Electronics engineers, except 517900 computer	17-2072	9.364	-0.022	0.019	15
		517900 Retail salespersons	41-2031	.	.	0.109	460
		Sales representatives, services, all 517900 other	41-3099	78.400	0.063	0.617	175
		Sales representatives, wholesale and manufacturing, technical and scientific 517900 products	41-4011	95.000	0.021	0.064	149
		517900 Customer service representatives	43-4051	70.529	0.062	0.174	161
		Telecommunications equipment installers and repairers, except line 517900 installers	49-2022	51.974	0.091	-0.002	359
		517900 Telecommunications line installers and repairers	49-9052	25.500	0.013	0.135	523
Data processing & related services		518200 All	00-0000	-0.081	0.000	0.060	
		Computer and information systems 518200 managers	11-3021	0.108	0.006	0.041	301
		518200 Computer programmers	15-1021	-0.471	-0.028	-0.087	59
		Computer software engineers, 518200 applications	15-1031	0.084	0.007	0.160	14
		Computer software engineers, systems 518200 software	15-1032	0.539	0.022	0.336	64
		518200 Computer support specialists	15-1041	-0.076	0.000	0.129	157
		518200 Computer systems analysts	15-1051	0.008	0.006	0.032	9
		Network and computer systems 518200 administrators	15-1071	0.062	0.005	0.378	65
		518200 Customer service representatives	43-4051	-0.168	-0.006	0.174	161
		518200 Computer operators	43-9011	-0.088	0.000	-0.329	170
		518200 Data entry keyers	43-9021	-0.167	-0.007	-0.195	19
Other information services		519100 All	00-0000	1.730	0.900	0.060	
		519100 Computer programmers	15-1021	16.714	0.028	-0.087	59
		Computer software engineers, 519100 applications	15-1031	18.227	0.031	0.160	14
		Computer software engineers, systems 519100 software	15-1032	21.290	0.051	0.336	64

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Industry	NAICS	Occupation	SOC (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (5)
		Network systems and data					
	519100	communications analysts	15-1081	16.381	0.027	0.557	348
	519100	Librarians	25-4021	0.178	0.041	-0.014	453
	519100	Library technicians	25-4031	-0.029	0.031	0.042	242
	519100	Editors	27-3041	2.712	0.036	0.009	147
		Sales representatives, services, all					
	519100	other	41-3099	10.561	0.048	0.617	175
	519100	Customer service representatives	43-4051	1.958	0.039	0.174	161
	519100	Library assistants, clerical	43-4121	0.660	0.067	0.044	352