

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

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Offshoring remains “an elusive phenomenon”

**Central to the elusiveness is the lack of data
(there are other factors as well – definitions)**

What do we want to know?

Magnitude and significance of shifting of business operations to offshore (foreign) locations and impact on American workforce (employment and earnings)

Source of elusiveness: data limitations & measurement concerns

Statistical and measurement limitations are widely acknowledged in three areas:

Increasing role of multi-national corporations (MNCs);

Technology transfer;

Increasing trade in services

One additional limitation important for understanding the labor market implications of increasing trade in services:

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.

What are the labor market impact questions?

Employment

- estimates of jobs moved offshore**
- estimates of lost potential job growth
(because jobs moved offshore)**
- jobs added due to foreign work here**
- jobs added due to efficiency gains**
- shifts in occupations**

Earnings

Displacement (numbers, worker characteristics, unemployment durations, UI receipt, re-employment)

Research on offshore outsourcing could benefit from a closer link to the domestic outsourcing literature.

Perspectives from international trade currently dominate the offshore outsourcing literature

Consider this a services version of “does trade cost jobs?”

This paper begins to draw out measurement implications from the domestic outsourcing literature for offshore outsourcing

One angle in the domestic outsourcing literature looks at shifts in the pattern of occupational employment across industries;

production worker employment moving from manufacturing to temporary help agencies

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

Job task content analyses motivated by characteristics of offshorability:

- 1. “Internet-enabled” (output that can be traded or transmitted by ICTs) - ICT-enabled services**
- 2. High information content (codifiable knowledge content; little tacit, nonroutine, implicit knowledge)**
- 3. No face-to-face (customer) contact**

Similar in spirit to Autor, Levy, Murnane (2003), where routine, clerical, decision-making and information production tasks displaced by automation and/or computerization

Abstract, problem solving and managerial tasks remain, along with jobs requiring physical and interpersonal activities (personal care, table waiting, order taking, housekeeping, janitorial)

Note: service (sector) offshoring is not the offshoring of service occupations, rather professional and administrative support

The original set of detailed occupational requirements, from O*Net:

Getting information

Inspecting equipment, structures, or materials

Processing information

Analyzing data or information

Interacting with computers

Documenting and recording information

Establishing & Maintaining interpersonal relationships

Assisting & Caring for others

Performing for or Working directly with the public

Dropped two:

Making decisions and solving problems

Thinking creatively

Added five:

Monitoring processes, materials and/or surroundings

Communicating with supervisors, peers, subordinates

("being with the boss")

Training & Teaching others (teachers)

Performing administrative duties

Coordinating work and activities of others

Table 1: Top 25 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	-0.454	10	12,600	\$83,590	12,300	\$70,250	0.024	0.017
19-3021	Market research 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	-0.564	16	62,630	\$65,320	55,560	\$54,520	0.127	0.024
15-1061	Database 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

Table 2: Bottom 18 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
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

Rising services trade and shifts in the occupational distribution of employment

**Following the approach in NAPA, 2006,
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:

- do high potential movability 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 movability?

NAPA (2006) 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.”

- **pharmaceutical and medicine manufacturing [3254]**

- **architectural, engineering, and related services [5413]**

- **computer systems design and related services [5415], and business support services [5614]**

Preliminarily, draw a set of service industries with a high-tech component with increasing trade flows, yet with a considerably larger set of detailed industries than NAPA (2006)

NAICS sectors:

51 (Information)

54 (Professional, Scientific and Technical Services)

56 (Administrative and Support Services)

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

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			(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

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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)
	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

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	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

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			(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					
		administrators					
	511200	administrators	15-1071	0.493	0.007	0.378	65
	511200	Computer specialists, all other	15-1099	.	0.026	0.470	40

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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)
		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

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)
		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					
	515100		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					
	515100		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					
	515200		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					
	515200		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					
	515200		43-6011	0.207	0.005	0.051	293
		First-line supervisors/managers of mechanics, installers, and repairers of telecommunications equipment					
	515200		49-1011	-0.126	-0.001	-0.004	760
		Telecommunications equipment installers and repairers, except line installers					
	515200		49-2022	0.546	0.032	-0.002	359

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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)
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 (1)	Within NAICS employment change, 2003-2008 (2)	Change in share of NAICS employment (3)	National-level employment change (4)	Movability index ranking (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

Conclusions

**A beginning: to build from domestic outsourcing
to a deeper understanding of offshore
outsourcing**

More work to be done!