1

Jobs Online

Alice O. Nakamura, Kathryn L. Shaw,
Richard B. Freeman, Emi Nakamura, and
Amanda Pyman

1.1 Introduction

In his 2001 *Journal of Economic Perspectives* article, David Autor wrote:

> The reasons that job boards have proliferated are clear. They offer more information, are easier to search, and are potentially more up to date than their textual counterpart, newspaper help wanted ads. (Autor 2001, 26).

Autor is describing the first generation job boards that were used much like the help wanted and position wanted sections of newspapers. He also notes the appearance, already by 2001, of other e-recruiting services, including employment sections on corporate websites, online application forms, and

searchable resume databanks. The use of e-recruiting has grown in volume and variety since 2001. This chapter seeks to provide insight into the nature of e-recruiting services as these have evolved in the United States, thereby laying a better basis for further research on the use and efficacy of different types of e-recruiting services and the importance for the United States (and other nations) of a U.S. lead in the provision and use of these services.

We first explain and document key features of the e-recruiting industry and the interrelationships among its service products. There is a large literature on information exchange in labor markets,[1] but relatively little has been written about how e-recruiting works and its providers. In writing about the e-recruiting industry, we draw on business reports, on interactions with employers in business discussion groups and classes, and on case example experiences from the operation of www.CareerOwl.ca, a Canadian e-recruiting company in business since 1998 that provides custom online job application products for companies in addition to operating a job board that Autor mentions by name in his 2001 *Journal of Economic Perspectives* article.

We then examine the Freeman Worldwide Job Search Survey data. The survey data confirm that educated, employed workers from around the globe are online and checking English-language material about jobs. Most respondents report not only that they are using general jobsites, but that they are using multiple such sites and also that they are checking the employment sections of company websites. Many of the respondents are living in lower-wage countries where U.S. businesses are involved via foreign direct investment and outsourcing. After building a factual and institutional foundation, we then share our thoughts on how the growth of e-recruiting can be expected to affect wage trends for various sorts of work.

1.2   Industry Basics and Five Key Facts about E-Recruiting

Both job-seeker and employer search and selection activities are referred to as recruiting. E-recruiting services for employers include:

- *Advertising job ads* on general jobsites (e.g., http://www.monster.com).
- *Construction and operation of custom employment sections for corporate websites* (e.g., http://www.wendys.com/careers/ on *Wendy's* website), often including the construction and management of *custom online application forms for job openings* and the associated databases for these forms.
- The collection via jobsites and online application forms of qualifications and contact information for job-seekers and the operation of *searchable resume databanks.*

1. See, for example, Autor, Katz, and Krueger (1998); Brunello and Cappellari (2008); Fallick, Fleischman, and Rebitzer (2006); Ioannides (2007); Katok and Roth (2004); Kuhn (2003); Lang (2000); Leamer (2001); Mortensen (1986); Quah (2002a, 2002b); Rebick (2000); and Roth (2002).

Regardless of who they are, those viewing job ads on general jobsites like Monster.com must usually register to use the full features of these sites. Registration on jobsites typically is free and involves providing a contact phone number, a working e-mail address, basic demographic information, information about current student or work status, and educational qualifications information. This information is termed a *resume,* without an accent on either "e."

Registered job-seekers can also fill out profiles about the types of jobs of interest to them. When a job ad is posted that meets the profile of a registered user, this triggers an e-mail *job alert.* The job alert service is believed to be popular with both students and employed jobsite users who are not actively looking for work at that point in time (the so-called passive job-seekers).

We focus on the three commercial U.S. jobsites—Monster, CareerBuilder, and HotJobs—and on three other U.S. jobsites operated according to not-for-profit principles. The e-recruiting providers that we examine are listed in table 1.1 alongside the prices charged for the publication of a single regular job ad and for search for a year over the jobsite's resume databank.[2] The commercial e-recruiting companies we discuss were chosen because they are the three largest ones. We refer to these hereafter as "the Big 3." As for the nonprofit providers, America's Job Bank was once America's largest e-recruiting site. Craigslist seems to be the best known by now of the nonprofit e-recruiting sites. And JobCentral is interesting because, as explained subsequently, it was started by and continues to be owned by a large nonprofit association of U.S. employers, including some companies that reportedly are also big users of e-recruiting services provided by commercial companies, including Monster.

Being large has network scale advantages for a jobsite. As Bolles (2007) explains:[3]

> "[I]t makes sense that the more popular a site is, the more likely that both job-hunters and employers will find what they are looking for there."

In addition to potential network scale effects for both job-seekers and employers, those who make their living helping job-seekers, from writers of job search guides to counselors in schools, must decide what services to recommend. It stands to reason that those who earn a living helping job-seekers would tend to prefer larger jobsites because they seem unlikely to close down. Also, there are probably increasing returns to scale effects for establishing jobsite brand names.[4]

Third party estimates of website size can be produced in different ways. One way is via counters installed on the computers of users, as for

2. See Brenčič and Norris (2008) for information about how these costs have changed over time.
3. See also Quah (2002a, 2002b) for more on network scale effects.
4. On returns to scale in advertising, see Kaldor (1950); Comanor and Wilson (1967, 1974); McCloskey and Klamer (1995); and Mullainathan, Schwartzstein, and Shleifer (2006).

Table 1.1   **Six U.S. E-recruiting providers**

Jobsite	Launch year	Price of a single job posting	Price for year-long, nationwide search over job-seeker resumes for regular business
		Providers with for-profit operating principles	
Monster.com	1995	$395 http://hiring.monster.com/products/BulkJobPostings.aspx	$9,995 http:/hiring.monster.com/products/CandidateSearch.aspx?
CareerBuilder.com	1996	$419 http://www.careerbuilder.com/jobposter/products/ postjobsinfo.aspx?sc_cmp2=JP_HP_JobLearn	$9,553 http://www.careerbuilder.com/jobposter/products/ searchresumesinfo.aspx?sc_cmp2=JP_HP_RDBLearn
hotjobs.yahoo.com	1997	$369 http://hiring.hotjobs.yahoo.com/hjss/ss-select-location. html?error=noState&City=	Resume search prices provided individually to employers based on their needs
		Providers with not-for-profit operating principles	
America's Job Bank (AJB)	1995	$0 (for 1995 through July 2007, when AJB was discontinued)	$0 (for 1995 through July 2007, when AJB was discontinued)
Craigslist.org	1995	$0 to 75, depending on the city[a]	Not applicable, Craigslist has position-wanted ads, but no resume bank
JobCentral.com	2001	$25	$25

Note: These prices were collected on October 25, 2007.

[a] For San Francisco Bay Area (https://post.craigslist.org/sfo/J) job postings now cost $75. For NYC, LA, DC, Boston, Seattle, and San Diego, the charge for a job posting is $25. Elsewhere the job postings, like all the other Craigslist services, are free.

Nielsen/NetRatings (column [1] of table 1.2) and Alexa (column [2]).[5] A second way is through agreements with Internet Service Providers (ISPs), which is the Hitwise way (columns [3] and [4]). And a third is from phone interviews or other surveys of job-seekers. The Jupiter Media Metrix comScore figures (columns [5] through [9]) are based on a continuous telephone survey using Random Digit Dialing. Table 1.2 shows that, for all data collection methods and all years for which results are shown, the rank ordering for Monster, CareerBuilder,[6] and HotJobs is the same, with Monster first.[7]

Employer surveys provide insight into the substantial usage that companies now make of e-recruiting. According to the 2007 report of the U.S.-based Society for Human Resource Management (SHRM), the private and public sector organizations that responded to the March 2007 SHRM survey attributed, on average, 44 percent of their new hires the previous year to e-recruiting (SHRM 2007, table 6b).

As noted previously, in addition to providing jobsites where job ads can be posted and building resume databases, e-recruiting companies often provide custom services to companies, such as the construction and hosting of employment pages for company websites. The annual surveys on the use of e-recruiting by the Global 500 companies are of special interest in this regard. Table 1.3 shows that, in 1998, 14 percent of Global 500 companies[8] did not have a corporate website, whereas by 2000, all did. And, in 1998, only 29 percent of Global 500 companies with corporate websites also used their websites for recruiting purposes whereas by 2003 this usage rate had increased to 94 percent.

North American companies adopted e-recruiting more rapidly than companies based elsewhere, as can be seen from table 1.4.[9]

Large U.S. retailers are especially heavy users of e-recruiting. For example, the figures in table 1.5 show that the employment sections of the

5. We only had access to 2004 rating figures for Nielsen/NetRatings, but this rating service has continued to state in press releases that Monster, CareerBuilder, and HotJobs are the top three career Web sites, in that order. Alexa has changed their reporting methods so that their earlier ratings are not comparable with more recent years, and Alexa stopped reporting figures for HotJobs separately from parent company Yahoo!.

6. Hitwise states that CareerBuilder is the most visited jobsite. They arrive at this conclusion by treating separately the figures for monster.com and for my-monster.com, which we combine.

7. The raw data are corrected by the rating companies for suspected bias problems (e.g., user deletion of cookies) to produce the reported traffic estimates. Processing details are considered proprietary and are only partially disclosed.

8. The Fortune Global 500 list, often referred to simply as the Global 500, is a ranking of the top 500 corporations worldwide measured by revenue. The list is compiled and published annually by Fortune magazine. As listed in Fortune Magazine in the first quarter of 2003, the regional percentage distribution of the Global 500 companies was 42.8 in North America, 24.4 in Asia-Pacific, 31.2 in Europe, and 1.6 in the rest of the world.

9. In 2007, the United States was home to 162 of the Global 500 companies; Canada was home to sixteen. The 2007 Global 500 list was published in the July 23, 2007 issue of *Fortune* magazine, and can be found online at http://money.cnn.com/magazines/fortune/global500/2007/countries/US.html.

Table 1.2   Jobsite traffic metrics

Jobsite name	Nielsen/NetRatings unique site visitors for June 2004 (millions) (1)	Alexa: reach per million on Internet, 3-month avg. as of Sept. 4, 2005 (2)	Hitwise: market share week ending April 15, 2006 (%) (3)	Hitwise: market share week ending Jan. 6, 2007 (%) (4)	ComScore: unique site visitors for Sept. 2004 (000) (5)	ComScore: unique site visitors for Sept. 2005 (000) (6)	ComScore: unique site visitors for Jan. 2006 (000) (7)	ComScore: unique site visitors for Sept. 2007 (000) (9)
Monster	9.6	4,515	18.73	15.64	18,331	25,792	27,283	25,615
CareerBuilder	9.3	2,950	16.09	15.05	14,329	18,648	21,247	22,507
HotJobs	7.1	1,650	5.53	5.33	—	—	—	—
America's Job Bank (AJB)	—	294	1.86	1.90	—	—	—	—
Craigslist.org	—	—			—	—	—	23,124
JobCentral	—	33			—	—	—	—

Note: For Hitwise, the figure for Monster is the sum of the Hitwise figures for www.monster.com and my.monster.com; the figure for CareerBuilder is the sum of the Hitwise figures for www.careerbuilder.com and msn.careerbuilder.com. For America's Job Bank, the Hitwise figure includes only traffic for the domain www.jobsearch.org, whereas the Alexa reach figure covers that plus http://www.ajb.dni.us/. The ComScore figure for Monster is for Monster Worldwide, and similarly for CareerBuilder.

Table 1.3 **Corporate website use for global 500 companies**

	1998	1999	2000	2001	2002	2003
Corporate website employment section	29	60	79	88	91	94
Corporate website, but no corporate website employment section	57	31	21	12	9	6
No corporate website	14	9	0	0	0	0

Source: iLogos Research (2003).

Table 1.4 **Percent of global 500 companies with employment sections, by region**

	2000	2001	2002	2003
North America	92	93	95	96
Asia/Pacific	68	88	90	96
Europe	73	83	92	94

Source: iLogos Research (2003).

Table 1.5 **Market shares for employment sections of company websites (for the week ended January 6, 2007)**

Name	Domain	Market share (%)
Careers at Target	careers.target.com	1.05
USAJobs	www.usajobs.gov	0.45
Wal-Mart Hiring Center	hiringcenter.walmartstores.com	0.30

Source: January 10, 2007 http://www.hitwise.co.uk/presscenter/hitwiseHS2004/us-11012007
careersites.php. Data is based on market share of U.S. Internet visits from a sample of 10 million U.S. Internet users.

corporate websites for Target and Wal-Mart receive large amounts of traffic compared even with the traffic figures for the USAJobs employment site for *all* U.S. federal government jobs.

1.3   E-Recruiting in the United States

Having outlined some of the basics for the e-recruiting industry, in section 1.3.1 we introduce the main commercial e-recruiting companies and five facts about commercial e-recruiting. Then, in section 1.3.2, the three selected U.S. nonprofit e-recruiting providers are introduced as well. And in section 1.3.3, we raise the question of how large commercial e-recruiting providers could coexist and grow alongside the nonprofit e-recruiting companies.

1.3.1   The Commercial Big 3: Monster, CareerBuilder, and HotJobs

The Big 3 commercial e-recruiting companies all sell recruiting services to employers. They all advertise that they are successful in attracting

job-seekers of the sorts that employers most want. A persistent theme in the business press is that most employers prefer not to hire those who are out of work for fear that there are hard-to-detect reasons why many of them are in this employment state. In this context, the empirical finding of Kuhn and Skuterud that the use of e-recruiting by unemployed job-seekers did not shorten their jobless spells is unsurprising.[10] In general, no one is paying commercial e-recruiting companies to help the unemployed find jobs.[11]

Among the Big 3, we pay the most attention to Monster because it is the largest of the commercial e-recruiting providers. Also, CareerBuilder and HotJobs, in many ways, have evolved following the Monster lead.

Monster Global was launched in 1995 by the Telephone Marketing Programs Company (TMP Worldwide), an established marketing company and a recruiting agency that was in a position to ensure a steady flow of job postings onto the Monster site from the start.[12] In 2000, Monster acquired the college and university e-recruiting market leader, JobTRAK, and renamed this service MonsterTRAK. Employers can use MonsterTRAK for institutionally targeting job postings. Only students and alumni of Harvard, say, get direct access to job postings on MonsterTRAK targeted to Harvard users. Employers can also pay to have messages e-mailed directly to designated pools of MonsterTRAK users, and can pay to search over the resumes of students registered with MonsterTRAK who have opted to have their resumes available to employers. In addition to ushering in native-born users, the MonsterTRAK feeder system draws in foreign students, including many who subsequently move back to their home countries and continue using Monster. MonsterTRAK provides recruiting services tailored to the needs of students and campus career offices, and has partnerships with leading educational institutions including Harvard, MIT, Princeton, and Berkeley.

If a job-seeker submits a resume via the online application form or a website managed by Monster, that resume can then be conveniently used for other purposes via the Monster system. If the job-seeker subsequently activates this resume while using the Monster system, it may then be made available as well in the main Monster resume bank.[13] In other words, Monster makes it especially easy for job-seekers to put their resumes into the

---

10. See Kuhn (2003) and Kuhn and Skuterud (2004).

11. Advertising revenues on an Internet site will tend to rise with increases in user traffic, but even advertising rates are affected by the online purchases that site users make and those out of work would not be expected to be high online spenders.

12. In line with this view, Bolles (2007) notes that: "Many of the job listings on Monster . . . are . . . placed by agencies."

13. See http://www.wendys.com/legal.jsp. As of November 3, 2007, a Google search for the exact phrase "powered by" followed by each of the relevant company names yielded 160,000 items for Monster and 110,044 items for CareerBuilder. HotJobs had few listings under its own name, but HotJobs parent Yahoo! had by far the most, though most of those are for other types of sites.

Monster resume bank. The following passage from Wendy's website illustrates this point:

> A portion of the Careers section of this website is powered by Monster. . . . [Y]our information and your resume are hosted on a segregated area of Monster's servers. . . . In the future . . . if you activate your resume on Monster's website, such activation will be treated as if you had originally registered with Monster and posted your resume in its searchable database for viewing and downloading by Monster's employer and agency clients.

Employers are sometimes interested in recruiting experienced workers as well as (or rather than) new graduates. Military.com was an important addition to the Monster family in this regard. Military personnel reentering the civilian workforce typically have technical skills, teamwork and leadership experience, and security clearances.[14] By 2003, Monster Global had built up a vast network of local content and language Internet sites throughout North America, Europe, and the Asia Pacific Region.[15] This global network of websites enables Monster to help U.S. companies doing business in foreign locations to find the workers they need, and is also valuable for businesses looking for workers in other countries to bring into the United States to meet skill shortages there or for outsourcing contract work.

CareerBuilder, launched in 1996, was developed as a complement to the classified advertising activities of media giants: Tribune, Knight Ridder, and Gannett. CareerBuilder has had an assured flow of job ads from the classified sections of affiliated newspapers. By the end of 2003, CareerBuilder also had achieved a global reach via partnerships in the United Kingdom, Ireland, Italy, Spain, France, Belgium, the Netherlands, Latin America, India, Australia, Malaysia, the Philippines, and Singapore.

HotJobs, the youngest of the Big 3, was launched in 1997, and is now owned by Yahoo! Yahoo!'s central objective is to increase the size and engagement of its portal user base, so as to increase the revenue from the online sale of goods and services by partnered merchants.

In going through the rest of this chapter, it is helpful for readers to keep in mind the following facts about commercial e-recruiting in the United States:

Fact 1: The main commercial jobsites are run by corporate giants with multiple complementary lines of business.

---

14. In her studies with various collaborators, including Andersson et al. (2008) and Lazear and Shaw (2007, 2009), Shaw argues that firms that are commercially successful innovators try to hire workers with histories of prior success as evidenced by being *employed* and what their employers have been willing to pay them. Andersson et al. (2008) show empirically that innovative firms grow by searching more and attracting star workers.

15. Over these years, Monster.com entered into partnerships and executed buyouts and takeovers that brought into their network large numbers of e-recruiting companies started by others, ranging from Flip Dog to China HR.com.

The Big 3 jobsites are not stand-alone operations. As already noted, Monster was started by a company selling advertising and corporate recruiting services. CareerBuilder is owned by media companies. And HotJobs is part of the Web portal Yahoo!.

Fact 2: E-recruiting can help increase the reach and reduce the costs of hiring.

E-recruiting services can help employers find and consider more, and more widely located, job candidates in the early phases of the recruiting process. (See Appendix A for a case study example.) Also, it is widely reported in the business press that the use of online application forms and applicant database software systems can substantially reduce the variable costs of recruiting. In other words, e-recruiting can allow businesses to search more widely, while decreasing certain applicant processing costs.

Fact 3: Big businesses enjoy returns to scale in using e-recruiting.

The cost of advertising a job posting on a commercial jobsite like Monster is usually the same whether the employer is looking for one new employee of a given type, or ten or 100. However, learning investments are required for employers to make good use of e-recruiting services like search over resume databanks, and these costs can usually be spread over larger numbers of hires by large companies. Other fixed costs are also involved in the making of custom employment pages for company websites and custom job application forms and their associated databases.

Fact 4: e-recruiting services indirectly promote search for employed workers

E-recruiting services can make it easier for recruiters to find and contact employed workers with suitable skills. Workers who passively look at job ads on jobsites like Monster typically must register to make full use of the jobsites, and this often results in their making their e-mail and other contact information available to the employers who pay for search over the resume databanks run by the large commercial e-recruiting firms. Virtually all employers that we have heard discuss the topic assert that they do not want *their* employees looking for work elsewhere while working for them. And yet, when employers go looking for experienced workers, many clearly state that they prefer to hire workers employed elsewhere. *Fast Company* contributing editor Scott Kirsner (2005) quotes Auren Hoffman, founder of the referrals company KarmaOne,[16] as stating: "A vast percentage of the people who are looking aren't the people you want. . . . It's extremely hard to get to the people who aren't actively looking, and generally, that pool is much better."[17] This is a candid statement of what we feel is a ubiquitous subtext in

16. KarmaOne has now been acquired by http://www.spotajob.com/us/, another referral company.

17. http://www.boston.com/business/technology/articles/2005/10/03/its_a_scary_time_for _monstercom/?page=2.

the trade literature on recruiting. This is also a position that employers using CareerOwl have made comments about to the CareerOwl Call Center staff.

Above the entry level, one might presume that problem workers could be reliably detected by checking references from past employers. However, employers sometimes ask unwanted workers to leave "voluntarily," offering these workers promises of good references if they comply. This alleged practice reportedly leaves many employers worried about hiring lemons[18] if they select from the pool of currently unemployed workers. The use of e-recruiting can augment fears of hiring lemons because less of the information about individuals found using e-recruiting is rooted in personal acquaintance, a key traditional strategy for employers to detect workers with hidden flaws.

Fact 5: The U.S. is the global leader in the provision of e-recruiting services

Many e-recruiting sites for other nations are run by U.S. companies.[19] The U.S. dominance in e-recruiting parallels U.S. dominance in other areas of Internet-related business.[20]

1.3.2   Nonprofit E-recruiting in the United States

We now introduce three selected nonprofit e-recruiting providers.[21] From the lower panel of table 1.2, it can be seen that these providers have nominal or no charges for employers. The existence of these services thus directs attention to functions the large commercial e-recruiting companies provide for employers that the nonprofit providers do not provide.

America's Job Bank (AJB) was launched in 1995 by the U.S. government.[22] The early success of AJB was noted, for example, in the 1999 testimony to the House Committee on Veterans' Affairs by Robert Gross, the President of the Interstate Conference of Employment Security Agencies:[23]

> America's Job Bank, the public workforce system's Internet-based job bank, is the largest job bank on the Internet with over one million job openings—far surpassing other job banks like Monster.com and HotJobs.

18. See Akerlof (1970, 2003); Spence (1973); Aigner and Cain (1977); Altonji and Pierret (2001); Milgrom and Oster (1987); and Gibbons and Katz (1991) on the "lemon theory" and its labor market applications.

19. For example, research on the Internet in Mexico revealed popular "Mexican" e-commerce sites that were hosted on computers in the United States (Curry, Contreras, and Kenney 2004).

20. Kenney (2003) argues that four features of the U.S. system led to this U.S. success: (a) research strength that provided first-mover advantages; (b) the flat rate local phone tariff and the competitiveness of the U.S. telecommunications sector; (c) the willingness of U.S. shoppers to switch to ordering online; and (d) U.S. venture capital, which funded vast numbers of experiments.

21. We include in the nonprofit category e-recruiting companies that, legally, are for profit, but have pledged to hold prices down and use any profits for stated good causes (e.g., Craigslist.org).

22. Alice Nakamura was given a briefing in 1995 by AJB officials as part of a fact-finding mission for Canada.

23. See http://veterans.house.gov/hearings/schedule106/oct99/10-28-99B/gross.htm.

America's Job Bank was the responsibility of the U.S. Department of Labor (USDOL).[24] All services were free. America's JobBank allowed job posting and job search by zipcode as an alternative to searching by state or city, so it was useful for rural as well as urban users. It also had a resume bank that employers could search. Effective July 1, 2007, the USDOL closed AJB. The reason given was that "the technology and markets have developed in such a way that government sponsorship is no longer needed."

Craigslist.org was launched in 1995 by an individual, Craig Newmark. By now, this is the best known of the surviving nonprofit jobsites. However, this service, by design, only meets the needs of job-seekers and employers looking locally. Craigslist is a collection of no-frills online community bulletin boards offering classifieds and forums for 450 cities, with most of the services being free. At the top of the page on Craigslist.org where employers must enter the information for their job postings, there is a message in red that states: "Please post to a single city/site and category only—cross-posting to multiple cities or categories is not allowed." In 2004, eBay acquired a 25 percent stake in Craigslist. However, Craigslist continues to operate as a collection of free and low cost community bulletin boards.

JobCentral.com is the jobsite of the DirectEmployers Association.[25] Once the Internet was available, employers began adding employment sections to their company websites. Employers soon discovered that most of their own websites do not attract enough traffic of the sort needed for recruiting. Big companies became the biggest customers of third party e-recruiting providers like Monster.

Over time, some big companies began to resent the fees and requirements of the e-recruiting companies. Hence in 2001, a group of big U.S. companies founded the DirectEmployers Association, which created JobCentral.com, and recruited William Warren (see Warren 2005), a former president of Monster, to run JobCentral. According to Ann Harrington (2002):

> [M]ajor clients like IBM, GE, and Lockheed Martin, which spend six figures—sometimes seven—per year on online job boards, are . . . joining together to create a nonprofit, no-frills career portal . . . And although none have torn up their Monster contracts just yet, some of the charter members suggest the big job boards' raison d'etre is no longer assured.

Owing to his years as president of Monster, Warren was aware of the importance to Monster of MonsterTRAK as a talent-feeder system. Thus,

24. Expected benefits to the United States had included the saving to the overall system from returns to scale in providing job posting and resume databank services along with the returns to the economy from improved decision making enabled by the information about the talent needs of employers and the skill sets of job-seekers that such a system could provide.

25. As of July 2007, 165 U.S. companies had joined DirectEmployers. Member companies include industry leaders such as Abbott Laboratories, Accenture, Cingular Wireless, GE, H&R Block, IBM, Kindred Healthcare, Lockheed Martin, Mellon Mutual of Omaha, Raytheon Company, Sprint, Union Pacific, and Xerox Corporation.

soon after taking charge of JobCentral, Warren set about trying to create a talent feeder system for JobCentral, too: NACElink, built in collaboration with members of the National Association of Colleges and Employers (NACE). Warren also sought to link Job Central to the U.S. state employment services. He created the JobCentral National Employment Network, consisting of fifty state jobsites and over 6,200 cities and communities.

1.3.3   Given the Nonprofit Competition, What Exactly Do the Big 3 Do for a Living?

The continued existence and growth of the commercial Big 3 along with low-cost services like Craigslist and JobCentral is prima-facie evidence that the commercial companies provide services of value to companies that the nonprofits do not. Based on our observations, services that largely satisfy this criterion include: (a) support for U.S. company recruiting that is worldwide; (b) well developed, searchable resume banks; (c) cooperative working relationships with established third party recruiters for large companies; (d) for-hire services for the construction and operation of the employment sections of corporate websites; and (e) for-hire services for the construction and operation of online job application forms and their databases.[26] Monster and CareerBuilder have also developed special feeder systems for experienced workers, and claim that their resume databanks are valuable resources for employers searching for experienced workers.

Thus far, none of the main U.S. nonprofit e-recruiting providers has engaged in heavy outreach activities aimed at building global networks or at aggressively building resume databases for experienced jobseekers.[27]

1.4   The Global Outreach of E-Recruiting

We turn our attention now to the issue of the sorts of job-seekers who can be reached via the Internet. For commercial e-recruiting to be able to provide global recruiting and outsourcing support for U.S. companies, there must be educated job-seekers in countries where U.S. businesses reportedly are interested in hiring. To find out about this, we examine data from a recent survey of online job search. Over the period of February through April of 2007, Richard Freeman ran his own online job search survey. The usage of e-recruiting has been rapidly changing. The recentness of the Free-

---

26. Commercial e-recruiting services try to ensure that *experienced, employed* workers are well represented in their user pools and resume databanks. Moreover, Stevenson (2005, 2007) finds that employment-to-employment flows have risen in the United States. See also Fallick and Fleischman (2004).

27. However, Bagues and Labini (chapter 4, this volume) write about a nonprofit e-recruiting provider that runs an extensive resume bank in Italy with the stated goal of helping the employers of the nation connect more cost effectively with the talent their tax dollars helped to train in the universities of the nation. The service that Bagues and Labini describe is actively supported by government and the educational institutions involved.

man survey is important, since the longest established of the e-recruiting firms were founded in 1995. When the results of this survey are considered alongside the growth of the e-recruiting industry, some interesting tentative conclusions emerge.

Freeman used the English language Google AdWords and AdBrite international advertising options to invite the job-seekers of the world to fill out his job search survey. The ads were shown to Internet users entering the key word "job search" and also on what the advertising agencies describe as "content sites," which are simply other Internet sites that the advertising agency personnel deemed likely to generate hits on the ad given the text of the ad itself. The only statistical information we have about those who saw the ad is based on the responses of those who opted to take the survey. Nevertheless, we would argue that fielding an international survey using online ads is one reasonable way of reaching the job-seekers we most want information from. In our view, this survey data should be thought of and used like case study data: evidence to be weighed alongside other available evidence.

Two inducements were offered to encourage people to fill out the survey. One was being entered in a draw for $1,000 in U.S. currency. The other was an offer of free job search advice:

> IF YOU COMPLETE THE SURVEY, you will receive, for FREE, an e-book with tips about what works for finding work.

The population of people who would see the ads is a population of people that e-recruiting could also hope to reach: job-seekers who frequent the Internet. There were twenty-eight questions in the Freeman survey (see appendix C), referred to in the text and tables as Q1–Q28.

Of course, any survey that offers inducements to survey takers could potentially attract some respondents who proceed to take the survey multiple times, though the directions say each person can only take it once. In processing the data, steps were taken to eliminate multiple and other bogus responses.[28] Also, the job survey contained a text box at the end where survey takers could enter a message for professor Freeman. We are reassured by the fact that many survey takers entered messages asking questions about job search and only one also mentioned something about her need for winning the prize money.

1.4.1   Who Are the Freeman Survey Respondents?

As can be seen from table 1.6, the Freeman survey pickup was much higher in lower wage countries in Asia and also Africa than in countries like

---

28. The Freeman survey is long and asks questions that make it unlikely that any two individuals would have identical responses on all questions. From an analysis perspective, the elimination of completed duplicate surveys that provide correct information would be less harmful than the retention of bogus completed surveys. Thus we eliminated all duplicate submissions. Also, multiple bogus entries would almost surely have different age and sex distributions than good data, and would tend to cause aberrations in the response patterns for some of the survey questions. Regular patterns by age and sex, and patterns that fit well with other available evidence, are circumstantial evidence that the data are of reasonable quality.

Table 1.6   **Number of respondents by country group**

	All	16–19	20–24	25–34	35–44	45–64
All countries	1,603	113	459	626	250	155
N. and S. America	221	9	45	55	49	63
All E.U.	203	24	50	70	37	22
Australia and N.Z.	183	36	43	54	26	24
All Africa	273	13	121	179	58	11
All Asia	609	31	199	256	79	35

Note: This table is based on the responses in the master file for all those who answered Q18 (country), Q20 (age), and Q21 (sex).

Table 1.7   **Age distribution of respondents**

	Men				Women			
	16–19	20–24	25–34	35–64	16–19	20–24	25–34	35–64
Full master data set	6.1	29.9	39.4	24.6	9.5	27.8	37.8	24.9
(N = 1,717)	(57)	(281)	(370)	(231)	(74)	(216)	(294)	(194)

Notes: The full data set consists of the responses in the master file for all those who answered questions Q20 (age) and Q21 (sex). Thus it includes the 114 survey takers who did not answer the question about what nation they were currently living in. The numbers in parentheses are sample sizes that apply for the percentage figures shown.

the United States and Canada and the United Kingdom and other higher income nations. The pattern of pickup on the survey supports the hypothesis that there are workers in lower wage countries who can easily be reached by employers via the Internet and via jobsites.

Jobsites can facilitate employer advertising for job candidates provided that the right workers are checking jobsites. The vast majority of the Freeman survey takers reported that they are checking jobsites. In this section, results are shown by age group and are usually shown separately as well by sex. Also, we focus on groups with at least 100 respondents. In each of the designated age groups except the youngest, from table 1.7 we see that somewhat more men than women took the survey. The distributions by age are quite similar for both sexes.

The vast majority of respondents state they are employed. Question Q2 asks respondents if they "worked as an employee" or if they were "self employed" the previous week. The responses are summarized in table 1.8.[29] From row 1, we see that most of the respondents were working. Presumably, those who are not working have more incentive to be interested in the

29. The sample sizes in the last row of table 1.8 are somewhat larger than the sample sizes shown in row 1 of table 1.6 (for all countries) since we have included in the tabulations for table 1.8 (and henceforth) the responses to other questions of respondents who did not specify their country. The country question involved a drop-down menu. Some respondents may not have understood how they could view that menu.

Table 1.8   **Work status by sex and age group (%)**

	Men			Women		
	20–24	25–34	35–44	20–24	25–34	35–44
	(1)	(2)	(3)	(4)	(5)	(6)
1. An employee and/or self employed	58.2	72.2	82.8	47.1	70.3	61.0
2. Self employed, and not an employee	10.7	9.0	13.1	4.4	7.6	11.9
3. Employee and also self employed	8.0	5.5	6.2	1.5	4.8	3.4
4. Not working	41.8	27.7	17.2	52.9	29.7	39.0
Number of observations	261	346	145	206	290	118

Note: This table is based on the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), and Q2 (activity last week).

Table 1.9   **Internet use (%)**

	Men			Women		
	20–24	25–34	35–44	20–24	25–34	35–44
	(1)	(2)	(3)	(4)	(5)	(6)
1. Have ever made a purchase online[a]	60.5	55.8	55.2	66.2	63.9	72.6
	(271)	(353)	(145)	(213)	(288)	(117)
2. Have ever looked/used jobsites[b]	82.5	87.6	86.3	85.0	93.8	86.4
	(268)	(356)	(146)	(214)	(290)	(118)

Note: The table is based on the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), Q4 (Internet purchase status), and Q6 (jobsite user). The numbers in parentheses are sample sizes that apply for the percentage figures shown.
[a]Checked "sometimes" or "often" on Q4.
[b]Selected "yes" on Q6.

tips for finding work that were offered for free to survey takers, more time for survey taking, and a higher need for winning the $1,000 draw. Thus, we would expect the proportions in row 4 of table 1.8 (those not working) to be higher than for the general population of Internet users.

Consistently high percentages of the survey takers report that they are checking jobsites (row 2, table 1.9): higher percentages than for those who have made an online purchase. Of course, the use of the Internet for making online purchases would be expected to be less common in lower income countries since the prices of the goods and services offered for sale on the Internet are set by companies focused mostly on selling to those in higher income countries.

1.4.2   How Are the Respondents Searching?

The respondents are not only using the jobsites to search for work, but it can be seen from table 1.10 that the majority are checking multiple jobsites. For those twenty-five to thirty-four and thirty-five to forty-four, the propor-

Table 1.10   **Jobsite users by number of sites used (%)**

	Men			Women		
	20–24	25–34	35–44	20–24	25–34	35–44
The number of jobsites used:	(1)	(2)	(3)	(1)	(2)	(3)
Percentage over 10	16.2	32.4	34.0	17.4	19.4	22.2
Percentage for 2–10	57.8	45.3	54.0	52.3	62.0	66.7
Percentage for 1	16.2	17.3	10.0	22.1	15.7	11.1
Number of respondents	142	139	50	86	108	36

Note: This table is on the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), Q6 (jobsite user), and Q15 (no. of sites).

Table 1.11   **Jobsite uses (%)**

	Men			Women		
	20–24	25–34	35–44	20–24	25–34	35–44
	(1)	(2)	(3)	(4)	(5)	(6)
1. Check job postings	44.0	47.5	47.3	50.0	54.1	46.6
2. Upload or send an online resume	26.9	32.3	38.4	29.0	35.9	35.6
3. Enable employers to find their resume	20.5	27.0	35.6	22.9	30.7	25.4
4. Get salary or wage information	22.0	28.4	32.9	24.8	29.7	23.7
Number of respondents	268	356	146	214	290	118

Note: This table is on the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), and Q6 (jobsite user).

tions who report checking over ten jobsites are significantly higher for men than women. In addition, the proportion checking ten or more jobsites rises with respondent age.

Those who use jobsites were asked about what they do on these sites. The most prevalent use is checking job postings, as can be seen from row 1 of table 1.11. About a third of the respondents in each age-sex group also report uploading or sending their resume using a jobsite. Moreover, the percentages are almost as high for those who note that they put their resume on a jobsite so that employers would be able to see it.

It is often said that personal contacts are of importance for finding employment. The respondents to the 2007 Job Search Survey mostly agree that personal contacts and referrals are useful (row 3, table 1.12).[30] Newspapers are selected as useful for job search by even higher percentages of respondents (row 2). However, Internet recruitment sites (i.e., jobsites) are

30. These response rates are similar for men and women, so we pooled over sex to focus attention on the age patterns.

Table 1.12   **Respondents by age who found each method useful (%)**

	20–24	25–34	35–44
1. Internet recruitment sites	77.0	80.1	85.8
2. National/local newspapers and/or trade magazines	74.2	76.1	80.9
3. Personal contact/referrals	63.8	68.1	74.7
4. Recruitment consultants/headhunters	43.2	53.4	58.6
Number	326	423	162

Notes: This table is based on the responses in the master file for men and women combined for all those who answered questions Q20 (age), Q21 (sex), and Q1 (methods of job search).

Table 1.13   **Percentage of survey respondents who used the Internet for finding current or most recent work**

Men			Women		
20–24	25–34	35–44	20–24	25–34	35–44
(1)	(2)	(3)	(4)	(5)	(6)
56.1	41.8	35.0	43.9	39.3	31.0
(255)	(340)	(143)	(198)	(277)	(116)

Note: This table is based on the responses for all who answered questions Q20 (age), Q21 (sex), and Q14 (used Internet to find most recent job). The numbers in parentheses are sample sizes for the percentage figures shown.

selected as useful for job search by the highest percentage for each of the age groups (row 1). More than three-fourths of the job-seekers in each age group indicated that jobsites are useful for job search.[31] In addition, more than 40 percent of each age group of respondents report that recruiters and headhunters have contacted them and have been useful (row 4). The proportions rise with the age group, with the adjacent pairs of proportions for the different age groups being significantly different at the 95 percent level of confidence. What this pattern suggests is that, over the prime working years of twenty to forty-four, job-seekers learn the advantages of searching via multiple channels.

The percentages of respondents in different groups who report they found their current or most recent work using the Internet range from 31 to 56 percent, as shown in table 1.13, which seems impressively high to us. These percentages decline with age, in contrast with the table 1.12 percentages in row 1. This makes sense. Many respondents are, in fact, employed, and reportedly have been with the same employer many years, and hence may have found their current job before e-recruiting became prevalent.

31. Also, Stevenson (2007) is surely right in noting that a difficulty in judging the meaning of responses to questions about the job search methods that job-seekers view as worthwhile is that neither they nor we can know what their counterfactual experiences would have been had they looked in ways other than what they each tried.

Table 1.14   **Percentage who used the Internet for finding current or most recent work, grouped by whether they have some university or college**

	Men		Women	
	20–24	25–34	20–24	25–34
	(1)	(2)	(4)	(5)
Some university or college	57.44	42.18	47.44	42.86
	(195)	(275)	(156)	(224)
No university or college	50.88	37.93	32.50	25.00
	(57)	(58)	(40)	(48)

Note: This table is based on the responses in the master file for those who answered Q20 (age), Q21 (sex), and Q14 (used Internet to find most recent job). The numbers in parentheses are sample sizes for the percentage figures.

Table 1.15   **Percentage of respondents using the Internet to search for work who also search on company websites**

Men			Women		
20–24	25–34	35–44	20–24	25–34	35–44
(1)	(2)	(3)	(4)	(5)	(6)
75.9	84.2	73.5	80.2	83.3	83.3
(141)	(139)	(49)	(86)	(108)	(36)

Note: This table is based on the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), Q14 (used Internet to find most recent job), and Q16 (used company websites for job search). The numbers in parentheses are sample sizes that apply for the percentage figures shown.

In table 1.14, the responses to the table 1.13 question are shown separately for those who have some university or college education versus those who do not (i.e., for those who answered "yes" versus those who answered "no" on Q25: "Have you attended some university or college?"). The differences between the education group pairs for each age group are significant, with a 95 percent level of confidence. Thus, university- and college-educated workers are significantly more likely to have used the Internet for finding work than less educated workers.

We were curious about whether those using jobsites also check for work opportunities on employer websites. From table 1.15, we find that the answer is "yes" for roughly 75 to 85 percent of the respondents in each age group.

General jobsites are good for helping job-seekers discover when various companies have job openings. It takes a job-seeker considerable time to visit, site by site, company websites, checking for postings of new job openings. However, job-seekers who are experienced at using the Internet to look for work can use general jobsites to make a list of the companies that are recruiting, and then can visit the websites of those companies directly to

view the job ads and apply if interested. One reason why a job-seeker might benefit from visiting company website employment pages is that companies sometimes post more positions on their own websites when they are recruiting than they publish on the general jobsite, and companies sometimes do a better job of updating information about positions that have been filled on their own websites. Secondly, it is often more convenient for job-seekers to apply for open positions on the employer websites because, in so doing, they only need to deal with the requirements of the employer rather than a combination of the employer's requirements and the information sought by the general jobsite for that company's operating and commercial purposes.

Finally, table 1.16 shows results for regressions using as the dependent variable a dummy variable set equal to 1 for those who selected "yes" on Q16 in answering: "Have you ever checked work opportunities on company or other employer websites?" The explanatory variables are all dummy variables. For the first variable, the dummy is set equal to 1 for those who selected "employee" on Q2. For the second variable, the dummy equals 1 if the respondent selected "often" on Q5 about the frequency of their use of general search engines like Google. For the third variable, the dummy equals 1 for respondents who answered "yes" for having completed high school or secondary school. For the fourth variable, the dummy equals 1 for a respon-

Table 1.16   **Coefficients for regression of dummy for job search using company websites**

	20–24 (1)	25–34 (2)	35–44 (3)
1. Intercept	.54	.50	.43
	(5.02)	(5.33)	(2.77)
2. Employee dummy	.02	–.02	–.03
(= 1 if "employee" selected on Q2)	(.50)	(.48)	(.49)
3. Frequent search engine user	.15	.15	.15
(= 1 if "often" selected on Q5)	(3.35)	(4.51)	(2.56)
4. High school completion dummy	–.00	.01	.11
(= 1 if "yes" for Q24)	(.04)	(.07)	(.67)
5. University education dummy	.11	.23	.14
(= 1 if "yes" for Q25)	(2.08)	(5.23)	(1.80)
6. Sex dummy	.01	.01	.01
(= 1 if "male" for Q21)	(.36)	(.28)	(.24)
Number of observations	447	593	246
R^2	.035	.082	.051
F-statistic	3.2	10.6	2.6

Notes: The dependent variable is a dummy set equal to 1 if the respondent selected "yes" on Q16. The regression data samples consisted of the responses in the master file for all those who answered questions Q20 (age), Q21 (sex), Q2, Q5, Q24, and Q25. The numbers in parentheses are the absolute values of t-statistics. Heteroscedasticity-corrected standard errors have been used.

dent who answered "yes" for having at least some university education. And the fifth variable is a sex dummy set equal to 1 for men.

From row 3 of table 1.16, we see that those who use general search engines frequently are more likely to report also checking company websites for job ads. Having some university or college education raises this probability. In row 6 of table 1.16, the sex dummy coefficients are insignificantly different from zero, like the coefficients for the employee dummy in row 2.

1.5 Discussion of Likely Labor Market Effects of the Growth of E-Recruiting

The use of e-recruiting services has grown greatly since Monster, the first launched of the Big 3, got its start in 1995. There is interest in trying to foresee how the continued growth of e-recruiting will affect wages for various sorts of work and workers.[32] We speculate on this issue here, drawing on information that is far from sufficient to prove our conjectures.

The job titles in table 1.17 are used to illustrate our ideas about how job attributes can be expected to shape the way the growth of e-recruiting will affect pay rates for different sorts of work. The columns of table 1.17 are defined in terms of differences in how contestable the jobs are for outsiders.

Table 1.17 also contains three panels, defined in terms of the required education levels for jobs. The education requirements for a job can affect how contestable it is. The three levels of education in table 1.17 were chosen to facilitate finding job descriptions on Monster.com with the stated educational qualifications. These levels are: (a) high school diploma, (b) a bachelor's degree, and (c) a bachelor's degree plus a PhD, MD, or JD degree.

In parentheses following each job listing in table 1.17 we show the number of job ads of that sort that were listed on Monster.com for New York City and vicinity (a twenty-mile radius) as of November 11, 2007. For each job listing, the median base salary is given, too, taken from the salary wizard on the Monster site[33] for that sort of work in New York. The figures on the number of listings for each job type demonstrate that Monster is being used by employers to search for all of these types of workers. As would be expected, the median pay levels for the various types of jobs rise as the education level rises, moving down each column.

Column (1)-type jobs must be locally carried out and locally staffed. We conjecture that small-sized classified advertisements in newspapers, which have always been low cost, and other mechanisms like posting notices in customary public places, gave employers adequate means for getting out the word about column (1)-type jobs long before the advent of e-recruiting.

---

32. Other related research on wage trends includes Autor, Katz, and Kearney (2005); Autor, Katz, and Krueger (1998); Autor, Levy, and Murname (2003); Bresnahan, Brynjolfsson, and Hitt (2002); and Kirkegaard (2005).

33. See appendix B for details of the Monster Salary.com salary wizard on the Monster site.

Table 1.17 Job types likely to be affected differently by globalization: Median base salary (number of positions advertised on Monster.com)

Work that must be locally carried out and locally staffed (G1)	Work that must be carried out locally, but that outsiders can be apply for and can come in to do (G2)	Work that potentially can be carried out anywhere in the world (G3)
Panel 1—Education level I: high school or less		
(C1)	(C4)	(C7)
Plumber I—$44,802 (7)	Janitor—$28,657 (2)	Accounting clerk, level I—$32,787 (213)
Electrician I—$46,877 (18)	Bus driver—$21,147 (4)	Call center, inbound representative, level I—$32,822 (640)
Panel 2—Education level II: bachelor's degree		
(C2)	(C5)	(C8)
School teacher—$56,665 (99)	Medical technician, emergency—$32,292 (239)	Tax accountant I—$54,430 (31)
	Dental assistant—$37,036 (2811)	Applications systems analyst I—$59,388 (199)
Panel 3—Education level III: PhD, MD, or JD		
(C3)	(C6)	(C9)
Lawyer II—$134,110 (2)	Postdoctoral scientist, 10+ years experience—$49,192 (12)	Scientist II, biotech—$104,929 (152)
Dentist—$151,483 (42)	Surgeon, cardiothoracic—$496,497 (1)	

Source: The numbers in parentheses are the number of positions of the given sort that were advertised on Monster.com for New York, and the twenty-mile commuting area around that city on November 11, 2007. The search terms used for counting the number of job listings were somewhat broader than those used for obtaining the median salary figures from the Monster.com salary wizard (http://monster.salary.com/salarywizard/layoutscripts/swzl_keywordsearch.asp). For example, instead of a cardiothoracic surgeon, we searched for positions for a heart surgeon.

E-recruiting services like online application forms might bring down hiring costs for some employers for column (1)-type jobs, but the savings would not necessarily be passed on to workers. We feel that the growth of e-recruiting and an increased ability of outsiders to find out about these sorts of job openings is not likely to affect the demand-and-supply conditions for column (1)-type jobs (directly at least)[34] since outsiders cannot be hired for these jobs.

Column (2)-type jobs must be locally carried out, but can be staffed by any qualified workers able to work in the United States (e.g., nannies). In contrast to the column (1) situation, for most column (2) sorts of jobs, we would expect the growth of e-recruiting to increase the supply and exert downward pressure on relative wage rates. For similar reasons, we would expect the growth of e-recruiting to put considerable downward pressure on *most* column (3) sorts of jobs: jobs that could be performed almost anywhere (e.g., call center services).[35]

However, we would expect the growth of e-recruiting to put *upward* pressure on wage rates for column (2) and (3) jobs requiring individuals with globally rare skills. As with a Rembrandt painting, when there is no way of quickly making more of something people want and would be willing to pay more to have immediately, then wider advertising will tend to cause the price to be bid up. Cardiac surgeons may well be an example of such a case.[36] Several people we have talked with in large businesses reported that their companies are mining resume databanks and using other forms of e-recruiting to seek out globally scarce skills needed by their companies.[37] There is no

34. Of course, legislators or the courts can overturn licensing and other restrictions on labor market competition. For example, many states once required foreign physicians to be U.S. citizens in order to obtain licenses. Also, from 1976 to 1991, foreign-born physicians were barred from obtaining temporary working (H-1B) status for performing direct patient care, but this situation changed in 1991. Mullan (2005, 1810–11) reports in the *New England Journal of Medicine* that, as of 2004, about 25 percent of physicians in practice in the United States were international medical graduates.

35. Welsum and Reif (2005), in an OECD report, use official statistics to examine the impact of offshoring on national labor markets. They list occupations where jobs are being offshored from developed nations and also list occupational characteristics of the jobs being offshored. See also Mann (2006) and Mann, Eckert, and Knight (2002). Freeman (2006) and Autor (2007) are among those who point to the growing cadre of educated workers outside the United States as a potential resource for addressing domestic skill shortages as these arise.

36. Mullan (2005, 1810–11) notes that international medical graduates constitute between 23 and 28 percent of physicians in each of the four developed nations he examines: the United States, the United Kingdom, Canada, and Australia. Mullan (2005, 1814) notes also that a heavy reliance of the four developed nations on international medical graduates from poor nations does not preclude them also drawing on each other, and that the United States is the clear net winner in this exchange while Canada is the biggest net loser.

37. The companies making this sort of use of e-recruiting are probably mostly very large companies that are in a position to pay for globally scarce talent when they succeed in locating such individuals. However, some smaller companies are also in a position to spend large amounts on hiring, as documented by Andersson et al. (2008), but the large companies are the mainstay revenue source for the large e-recruiting companies.

readily observable indicator for globally scarce worker skills. However, these skills tend to be developed by advanced post-graduate education programs.

1.6   Concluding Remarks

The matches that employers and job-seekers make determine the makeup of companies for generations to come as surely as the love matches of men and women do for family trees. Understanding developments affecting the nature of these matches is of the utmost importance for the future of a nation and its companies and workers. E-recruiting by now has evolved into a suite of services that employers can use for finding and connecting with job candidates: job posting, resume search, and online job application forms and their associated applicant tracking systems. We speculate that commercial e-recruiting companies like Monster have continued to grow alongside cheaper nonprofit e-recruiting providers because the commercial companies provide services not available from the nonprofits, including global recruiting support.

We take an initial step in empirical analysis of how job-seekers from nations around the globe are using e-recruiting services by reporting results for the 2007 Freeman Worldwide Job Search Survey. Most of those who took this survey were employed. The survey asked respondents about how they search for work, and what they do on jobsites. It asked about respondent perceptions of the relative usefulness of jobsites compared with other employment information sources such as newspapers, and about how the respondents found their present or most recent jobs. We find that 82 to 94 percent of the survey respondents are checking jobsites. Indeed, most are checking multiple jobsites. About a fourth are aware that employers are searching over resumes on jobsites, and a substantial proportion reported being contacted by recruiters. A high 73 to 84 percent of those using the Internet for job search also reported that they are checking the employment sections of company websites, revealing a more sophisticated understanding of how e-recruiting services can be used to find work. Respondents with some university or college education are significantly more likely to be using the Internet for job search, and more likely to also be checking the employment sections of company websites.[38]

In concluding, we also share our vision of how the growth of e-recruiting over the coming decades might be expected to affect wage growth for different types of jobs and workers. We anticipate downward pressure on wage rates for types of jobs that outside workers can compete for and for which the numbers of qualified workers are globally plentiful. However, we anticipate upward pressure on remuneration for types of work that require workers

38. About 68 percent are in the prime working ages of twenty to thirty-four, and 81 percent of these have some college or university education.

with skills for which there are global shortages. We believe that e-recruiting is likely to be especially helpful for U.S. multinational companies that need to hire in multiple nations. We believe that the U.S. dominance in e-recruiting might be a part of the explanation for the relative success of U.S. multinational companies in lines of business where recruiting is an ongoing activity because of workforce churning, or because survival demands ongoing innovation.[39]

Appendix A

One Company's Transition to E-Recruiting

Here we describe the transition of one company (company X hereafter) from traditional to e-recruiting. The specifics illustrate more general points made in the body of the text.

The old recruiting process for company X for their entry-level management track positions began each year with the drafting of a description of their job openings. The description of the job openings at company X was sent to the career and placement services (CAPS) offices at five large universities where company X traditionally recruited. Next, an interviewer traveled from one university to the next, conducting initial interviews and collecting hard copy resumes at each campus. About 200 initial interviews were conducted. Some students who got initial interviews turned out not to have taken the required courses specified in the job ad, but the company found enough qualified candidates each year.

After the initial interview round, the recruitment director went through the collected resumes and interviewer notes and chose twelve or so of the students for follow-up phone calls and reference checks. Two to six were then short listed and invited for interview trips to the company headquarters. Usually two or three of the short listed candidates were subsequently hired. *The company reported a high retention rate and believed this was largely due to confining their search to the selected five universities.* However, company X had no information to back up the belief that confining their search for job candidates to just five universities produced better results because they never tried searching more widely prior to switching to e-recruiting. What was certain was that adding more universities to their field of search would have increased their recruiting costs because of increases in interviewer costs.

After company X adopted e-recruiting, the first phase of the recruiting cycle still began with the drafting of a description of the job openings. Company X also drafted the questions for an online application form, and arranged to

39. See Feldstein (2003) and Freeman (2002).

have an e-recruiting company build, host, and advertise the online application form and the associated applicant tracking database.[40]

When the application period closed, company X had more than 1,000 complete files for applicants with the required qualifications. These files were automatically sorted according to prescreening questions embedded in the online application form. Scanned-in transcripts were included as part of each applicant file. The recruitment director shared the applicant files with the directors whose groups had the openings. The director explained it was now far easier for the files to be shared than before because they were now electronic. Those who went through the files entered notations for the candidates that interested them most. The recruiting director went through the files and notations and about 320 applicants were selected for initial phone interviews—sixty-two of these applicants were chosen for initial in-person interviews. Those chosen for the in-person interviews were at eight different locations. A trip for the recruiter was mapped out and the initial in-person interviews were carried out with much more prior information than in past years. After the initial interviews, the process proceeded essentially as it had in the years before the adoption of e-recruiting, and two candidates were hired that year. The experiences of that first year have basically been replicated each of the subsequent years.

With the switch to e-recruiting for company X, a bigger number of students and grads at more universities and colleges found out about the job openings and applied. The two-year retention rates for new hires have been high since the switch to using e-recruiting, but they were high before as well. Company X believes that it is more likely that they will sometimes be able to find and recruit star employees with their new recruiting approach compared with their old one. But so far, the only clearly demonstrated outcome from the adoption of e-recruiting is that the total cost per hire is lower. The savings in recruiting cost were achieved primarily through a reduction in paperwork for handling the files of applicants and a reduction in interviewer travel costs.

Appendix B

Salary.com

The Salary.com service offered on the Monster website uses purchased information from surveys conducted by compensation consulting firms. The fol-

40. This contract was won by the CareerOwl Institute, a nonprofit e-recruiting company for which Alice Nakamura is the volunteer president. The information about the experiences of company X is used with permission, with some details changed to protect the identity of the company. For more on the CareerOwl Institute, see Nakamura and Lawrence (1994); Nakamura et al. (1999); Nakamura and Pugh (2000); Nakamura, Wong, and Diewert (1999); Warburton and Warburton (2001); and Nakamura and Bruneau (2002).

lowing explanation is given: "Salary.com does not use any salary information from individual site users, placement agencies, job postings, nor any other sources that would traditionally be characterized as 'unreliable' by compensation or human resource professionals." Salary.com states that the results provided are arrived at using the ongoing analysis of their experts and their proprietary mathematical model. Salary.com attempts to validate and adjust their salary information using comparisons with other market indicators such as government data (e.g., the Bureau of Labor Statistics, though these data are typically older than the commercially available survey data and the results for these validation exercises are proprietary). The Salary.com wizard lets the user specify a metropolitan region and applies a geographic differential to reflect differences in pay levels in different cities or geographic areas. The national median salary for a job (which is returned if the user does not enter a zip code or region) is given a weight of 100.0, and salaries in other regions are expressed in relation to the national median based on cost of living and purchasing power adjustment factors. In table 1.17, we report pay results for New York because we needed to choose a location for counting the available job openings posted on Monster.com.

Appendix C
The 2007 Freeman Job Search Survey

2007 Worldwide Job Search Survey
(February 15, 2007 version)

Learn what works for finding work!
Complete this survey, and you'll be entered into a $1,000 US cash prize draw!
(some conditions apply click <u>here</u> for details)

This survey is being conducted by Dr. Richard Freeman, a professor at Harvard University and the London School of Economics. To learn more about Dr. Freeman, click <u>here</u>.

IF YOU COMPLETE THE SURVEY, you will receive, for FREE, an e-book with tips about what works for finding work.

** Your information will only be used for statistical analyses about job finding methods and outcomes. No personal information will be released. **

---

1. In your experience, which of the following are useful methods of looking for work? (Check ALL methods you feel are useful. For each one of these, choose a term from the drop down menu to indicate HOW useful you found that method.)

☐ National/local newspapers and/or trade magazines ▾

☐ Internet recruitment sites ▾

☐ Personal contact/referrals ▾

☐ Recruitment consultants/headhunters ▾

☐ Networking or word of mouth ▾

☐ Careers office/graduate recruitment ▾

☐ Career fairs/exhibitions ▾

☐ Other (please specify)

☐ Not relevant; never looked for a job

---

2. Check *all* of the following that describe your activity last week?

☐ worked as an employee

☐ self employed

☐ unemployed

☐ on strike

☐ attended school/studied

☐   kept house, caring for children or others

☐   inactive due to illness, injury or disability

3. Which of the following places do you use the computer? Check *all* that apply.

☐   work

☐   home

☐   school

☐   library

☐   other (specify) ☐

4. Have you ever made a purchase over the Internet?

☐   sometimes

☐   often

☐   never

5. Do you ever use search engines (such as Google) to look for information on the Internet?

☐   sometimes

☐   often

☐   never

6. Have you ever looked at or used Internet job sites?

☐   Yes

☐   No

If yes, why? (Check ALL answers that apply. For each one of these, choose a term from the drop down menu to indicate HOW useful you found Internet job sites for the stated purpose.)

☐   To check job advertisements ▼

☐   To find out about specific companies/potential employers
▼

☐   To obtain information about industry sectors ▼

☐   To access career tips/advice ▼

☐   To get salary or wage information ▼

☐   To create an online resume ▼

☐   To upload or send an online resume ▼

(continued)

☐   To enable potential employers and recruiters to find your resume

[dropdown ▼]

☐   To access employment news [dropdown ▼]

☐   To access research or reports [dropdown ▼]

☐   For career planning [dropdown ▼]

---

7. Do you have work now?

☐   yes

☐   no

If yes, are you satisfied with your current job?

In terms of pay ☐ yes ☐ no

In terms of benefits ☐ yes ☐ no

In terms of the type of work that you do ☐ yes ☐ no

In terms of relations with supervisors ☐ yes ☐ no

In terms of relations with co-workers ☐ yes ☐ no

If yes, how much longer do you intend to stay at this job? (choose the answer that best describes your expectations)

☐   Less than another month? ☐ 1-11 months ☐ 1-5 years ☐ 6-10 years

☐   more than 10 years

---

8. If you are not working now, when did you last work?

☐   never

☐   within the last 12 months

☐   prior to the last 12 months

---

9. Are you looking for work now?

☐   yes

☐   no

If you are *not* looking now, do you plan to look for work in the coming 12 months?

☐   yes

☐   no

If you are *not* looking for work now, have you ever looked for work?

☐   yes

☐   no

10. When you last looked for work, what was your main motivation?

☐ wanted to find a first job

☐ needed work because of losing or quitting the work I had before then

☐ was working, but wanted to find a new job

☐ needed to show evidence of job search as a requirement for collecting income support benefits like unemployment insurance

☐ just curious about the jobs available

☐ not applicable; never looked for work before

11. How did you find the work you have now, or that you had most recently?

☐ Through friends or other people I knew

☐ Through a newspaper ad

☐ Through an ad I saw on a bulletin board

☐ On an Internet recruitment site

☐ On a company web site

☐ I was contacted directly by the employer

☐ Union/professional organisations

☐ Recruitment agency/headhunters

☐ Through a school career or employment office

☐ Other; please specify ☐

☐ Not relevant; never worked before

12. Have you ever filled out a job application on the Internet?

☐ yes

☐ no

13. How long did it take you to find your current or most recent work?

☐ No time; they came to me

☐ Less than 6 months

☐ 6 months to a year

☐ More than a year

☐ Not relevant; I never worked so far

14. For finding your current or most recent work, did you use the Internet?

☐ yes

☐ no

If you used the Internet, how important was this as a means of job search?

☐ very

☐ somewhat

☐ not very

☐ not at all important

15. Approximately how many online recruitment sites did you visit while looking for your current or most recent work?

☐ 0

☐ 1

☐ 2-10

☐ more than 10

☐ not relevant; never looked for work before

16. Have you ever checked work opportunities on company or other employer web sites?

☐ yes

☐ no

If yes, was this useful?

☐ very

☐ somewhat

☐ not very

☐ not at all

17. While you were looking for your current or most recent work, which of the following best describes what you were doing?

☐ working at another job for the same employer

☐ working at another job, for a different employer

☐ doing contract work or working in my own business

☐ working in a family business

☐ ill or recovering from an accident

☐ unemployed

☐ studying

☐ homemaker; caring for others

☐ other; please specify ☐

☐ not relevant; never worked

18. What country are you living in now?

| Choose One... ▼ |

19. Which of the following best describes where you live? (choose one of the following)

☐ big city (more than one million people)

☐ smaller city or town

☐ rural or other non-urban place of residence

20. How old are you?

☐ < 16 years of age

☐ 16-19 years of age

☐ 20-24 years of age

☐ 25-34 years of age

☐ 35-44 years of age

☐ 45-64 years of age

☐ over 64 years of age

21. Are you:

☐ Male

☐ Female

22. Which of the following best describes the industry of your current or most recent work?

☐ Not relevant; never worked

☐ Biotech/pharmacy

☐ Education

☐ Engineer/Applied sciences

☐ Finance

☐ Health care

☐ Hospitality/tourism

☐ Human resources

☐ Insurance

☐ IT or e-commerce

☐ Legal

☐ Manager/Administration

☐ Marketing

☐ Natural sciences

☐ Primary industry such as mining, oil or gas, forestry, farming or fishing

☐ Production management

☐ Public service

☐ Recreation/culture

☐ Retail

☐ Trade or Transportation

☐ Other (please specify) [____]

23. For your current or most recent work, what type of organisation is/was this for?

☐ Public sector/government

☐ Private business

☐ Volunteer organization

☐ Myself, or a family business

24. Have you completed high school or secondary school?

☐ yes

☐ no

25. Have you attended some university or college?

☐ yes

☐ no

If yes, list any degree(s) you completed?

26. Do you have technical school or trade training or certification?

☐ yes

☐ no

If yes, what training or certification do you have?

| |

27. Were you a student at any time over the last 12 months?

☐ yes

☐ no

If yes, were you a full time student?

☐ yes

☐ no

Were you studying by correspondence or in a distance learning program?

☐ yes

☐ no

If yes, when will you finish your program of study?

☐ already finished

☐ within the next 12 months

☐ more than 12 months from now

28. How much did you earn from work in the last full year (12 months)?

☐ Earnings for last year: | | | ▼ |

☐ Not relevant; did not work for pay or profit

29. If you could give some advice to others like you who are looking for work now, what would that be?

If you wish to be entered in the draw for the $1000 US prize and to receive a job search e-book, enter your e-mail address: [   ]

(For details concerning the prize draw, click here.)

If you have any questions or concerns about this survey, or suggestions to make, or if you wish to send a message to Professor Freeman, please enter your remarks here:

Thank you for taking the survey!

[Submit Survey]

References

Aigner, D., and G. Cain. 1977. Statistical theories of discrimination in labor markets. *Industrial and Labor Relations Review* 30: (2): 175–87.

Akerlof, G. A. 1970. The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84 (3): 488–500.

———. 2003. Writing "The Market for 'Lemons'": A personal and interpretive essay. Available at: http://nobelprize.org/nobel_prizes/economics/articles/akerlof/index .html.

Altonji, J., and C. Pierret. 2001. Employer learning and statistical discrimination. *Quarterly Journal of Economics* 116 (1): 313–500.

Andersson, A., M. Freedman, J. Haltiwanger, J. Lane, and K. L. Shaw. 2008. Reaching for the stars: Who pays for talent in innovative industries? Available at: http://www.indexmeasures.com/dc2008/finalprogram.htm.

Autor, D. H. 2001. Wiring the labor market. *Journal of Economic Perspectives* 15 (1): 35–40. (A Working Paper version of this paper can be found at http://web.mit .edu/dautor/www/papers.html.)

———. 2007. Structural demand shifts and potential labor supply responses in the new century. Paper presented at the Federal Reserve Bank of Boston Conference on Labor Supply in the New Century. 19–20 June, Boston, MA.

Autor, D. H., L. F. Katz, and M. Kearney. 2005. Trends in U.S. wage inequality: Reassessing the revisionists. NBER Working Paper no. 11627. Cambridge, MA: National Bureau of Economic Research, September.

Autor, D. H., L. F. Katz, and A. B. Krueger. 1998. Computing inequality: Have

computers changed the labor market? *Quarterly Journal of Economics* 113 (4): 1169–1214.

Autor, D. H., F. Levy, and R. Murname. 2003. Skill content of recent technological change: An empirical exploration. *Quarterly Journal of Economics* 118 (4): 1279–1333.

Bolles, R. N. 2007. What color is your parachute 2007: A practical manual for job-hunters and career-changers. Berkeley, CA: Ten Speed Press.

Brenčič, V., and J. B. Norris. 2008. Online job boards as an employer recruitment tool. Available at: http://www.indexmeasures.com/dc2008/finalprogram.htm.

Bresnahan, T., E. Brynjolfsson, and L. M. Hitt. 2002. Information technology, workplace organization and the demand for skilled labor: Firm-level evidence. *Quarterly Journal of Economics* 117 (1): 339–76.

Brunello, G., and L. Cappellari. 2008. The labour market effects of Alma Mater: Evidence from Italy. *Economics of Education Review* 27 (5): 564–74.

Comanor, W. S., and T. A. Wilson. 1967. Advertising, market structure, and performance. *The Review of Economics and Statistics* 49 (November): 423–40.

———. 1974. Advertising and market power. Cambridge, MA: Harvard University.

Curry, J., O. Contreras, and M. Kenney. 2004. The Mexican Internet after the boom: Challenges and opportunities. *Berkeley Roundtable on the International Economy,* Paper BRIEWP159.

Fallick, B., and C. A. Fleischman. 2004. Employer-to-employer flows in the US labor market: The complete picture of gross worker flows. FEDS Working Paper no. 2004-34, May.

Fallick, B., C. A. Fleischman, and J. B. Rebitzer. 2006. Job-hopping in Silicon Valley: Some evidence concerning the microfoundations of a high-technology cluster. *Review of Economics and Statistics* 88 (3): 472–81.

Feldstein, M. 2003. Why is productivity growing faster? NBER Working Paper no. 9530. Cambridge, MA: National Bureau of Economic Research, March.

Freeman, R. B. 2002. The labour market in the new information economy. NBER Working Paper no. 9254. Cambridge, MA: National Bureau of Economic Research, October.

———. 2006. People flows in globalization. *Journal of Economic Perspectives* 20 (2): 145–70.

Gibbons, R., and L. Katz. 1991. Layoffs and lemons. *Journal of Labor Economics* 9 (4): 315–89.

Harrington, A. 2002. Can anyone build a better monster? *Fortune,* May.

iLogos Research. 2003. Global 500 website recruiting: 2003 Survey, iLogos Research, Division of Taleo. Available at: www.ilogosresearch.com.

Ioannides, Y. M. 2007. Empirics of social interactions. Tufts University Discussion Paper no. 0611. Tufts University Economics Department.

Kaldor, N. V. 1950. The economic aspects of advertising. *Review of Economic Studies* 18 (1): 1–27.

Katok, E., and A. E. Roth. 2004. Auctions of homogeneous goods with increasing returns: Experimental comparison of alternative "Dutch" auctions. *Management Science* 50 (8): 1044–63.

Kenney, M. 2003. The growth and development of the Internet in the United States. In *The global Internet economy,* ed. B. Kogut, 69–108. Cambridge, MA: MIT Press.

Kirkegaard, J. F. 2005. Outsourcing and skill imports: Foreign high-skilled workers on H-1B and L-1 visas in the United States. Working Paper no. 05-15, Peterson Institute.

Kirsner, S. 2005. It's a scary time for monster.com. *Boston Globe,* October 3.

Kuhn, P. 2003. The Internet and matching in labor markets. In *New economy handbook,* ed. D. C. Jones, 508–23. Amsterdam: Academic Press.

Kuhn, P., and M. Skuterud. 2004. Internet job search and unemployment durations. *American Economic Review* 94 (1): 218–32.

Lang, K. 2000. Panel: Modeling how search-matching technologies affect labor markets. Paper presented to IRPP and CERF Conference on creating Canada's advantage in an information age. May, Ottawa.

Lazear, E. P., and K. L. Shaw. 2007. Personnel economics: The economist's view of human resources. *Journal of Economic Perspectives* 21 (4): 91–114.

———. 2009. Wage structure, wages, and mobility. In *The structure of wages: An international comparison,* ed. E. P. Lazear and K. L. Shaw, 1–57. Chicago: University of Chicago Press.

Leamer, E. 2001. The economic geography of the Internet age, NBER Working Paper no. 7959. Cambridge, MA: National Bureau of Economic Research, August.

Mann, C. L. 2006. *Accelerating the globalization of America: The role of information technology.* Washington, D.C.: Peterson Institute for International Economics.

Mann, C. L., S. E. Eckert, and S. C. Knight. 2002. *Global electronic commerce: A policy primer.* Washington, D.C.: Peterson Institute for International Economics.

McCloskey, D., and A. Klamer. 1995. One quarter of GDP is persuasion. *Rhetoric and Economic Behavior* 85:191–95.

Milgrom, P., and S. Oster. 1987. Job discrimination, market forces, and the invisibility hypothesis. *Quarterly Journal of Economics* 102:453–76.

Mortensen, D. T. 1986. Job search and labor market analysis. In *Handbook of labor economics,* ed. O. Ashenfelter and R. Layard, 849–919. Amsterdam: Elsevier Science Publishers.

Mullainathan, S., J. Schwartzstein, and A. Shleifer. 2006. Coarse thinking and persuasion. NBER Working Paper no. 12720. Cambridge, MA: National Bureau of Economic Research.

Mullan, F. 2005. The metrics of the physician brain drain. *New England Journal of Medicine* 353 (17): 1810–18.

Nakamura, A. O., and J. Bruneau. 2002. The global talent hunt and the growth of e-recruiting in Canada. In *Renovating the ivory tower: Canadian universities and the knowledge economy,* Policy Study 37, ed. D. Laidler, 80–104. Toronto: C.D. Howe Institute (www.cdhowe.org).

Nakamura, A. O., and P. Lawrence. 1994. Education, training and prosperity. In *Stabilization, growth and distribution: Linkages in the knowledge era,* ed. T. J. Courchene, 235–79. Kingston, Ontario: John Deutsch Institute for the Study of Economic Policy, Queen's University.

Nakamura, A. O., M. Percy, P. Davenport, R. Fraser, and M. Piper. 1999. The genesis of CAREEROWL: The story of how SSHRC funded university research led to an on-line electronic hiring hall for Canadian post secondary students and alumni. Vancouver.

Nakamura, A. O., and T. Pugh. 2000. Our governments should stop freezing out smaller Canadian e-recruiters. *Policy Options* 21 (8): 48–52.

Nakamura, A. O., G. Wong, and W. E. Diewert. 1999. New approaches to public income support in Canada. *The local dimension of welfare-to-work: An international survey,* ch. 11, 297–337. Paris: Organization for Economic Cooperation and Development.

Quah, D. 2002a. Digital goods and the new economy. LSE Discussion Paper. Available at: http://www.strategic.gr/publications/NewsAlert/2004/03/03/TL/ThoughtLeaders1.pdf.

———. 2002b. Spatial agglomeration dynamics. *American Economic Review* 92 (2): 247–52.

Rebick, M. E. 2000. The importance of networks in the market for university grad-

uates in Japan: A longitudinal analysis of hiring patterns. *Oxford Economic Papers* 52:471–96.

Roth, A. E. 2002. The economist as engineer: Game theory, experimentation, and computation as tools for design economics. Fisher-Schultz Lecture, *Econometrica* 70 (4): 1341–78.

Society for Human Resource Management (SHRM). 2007. 2007 Advances in e-recruiting: Leveraging the .jobs domain. Alexandria, VA: SHRM.

Spence, A. 1973. Job market signaling. *Quarterly Journal of Economics* 87:355–74.

Stevenson, B. 2005. The Internet, job search. Paper presented at the 2005 Meeting of the American Economics Association, Philadelphia, Pennsylvania.

———. 2007. The Internet and job search. Paper presented at the conference on Labor Market Intermediation. 17–18 May, Cambridge, MA.

van Welsum, D., and X. Reif. 2005. *Potential offshoring: Evidence from selected OECD Countries.* Paris: OECD, July.

Warburton, R. N., and W. P. Warburton. 2001. Canadian-made e-solution proves cheap and effective. *Canadian Business Economics* 8 (3): 37–39.

Warren, W. 2005. New national online job board JobCentral to launch with more than 310,000 listings. Available at: http://www.jobcentral.com/JClaunch4_05.asp.