The Dynamics of Internet Recruiting: An Economic Analysis

William J. Moon, University of Michigan

Internet has changed many traditional means of how the world works, and the Corporate America has long been known to be receptive to such change. Recruiting via the internet, in the form of job search websites, is already a $1.3 billion industry, and is expected to grow by leaps and bounds in the forthcoming years. As of 2001, more than 75% of Fortune 500 Companies and more than 90 percent of large U.S. companies reported to jumped on board for internet recruiting (Leonard 2000; Capelli 2001). Such phenomenon has naturally drawn attention to economists, who have begun to speculate the macroeconomic effects that the trend has on the labor market.

The diffusion of this new technology, many economists concur, enhances the efficiency of the labor market by providing an extra venue for the market transaction to take place. Mortensen and Khun, for example, have argued that lower cost and greater information diffusion involved with internet recruiting could lead to lower frictional employment, higher average match quality, and a reduction of non-competitive wage differentials (Dale T. Mortensen, 2000; Kuhn, 2000).

Empirical research, however, have not been able to substantiate the theory. Peter Kuhn and Mikal Skuterud, in particular, have recently concluded that, "internet job search is ineffective in reducing unemployment duration" (Kuhn and Skuterud 2000). They attribute this finding to the unique demographic characteristics of internet job searchers, which tend to be better educated individuals with lower unemployment rates to begin with. Yael Hadass of Harvard University has found similarly mixed results, concluding that while internet recruiting has reduces application costs for job seekers, it could have resulted in reduced "quality match" between employers and employees. These empirical researches, while helpful in some respects, are severely limited in that they only partially explain the complexities of the new technology's effect on the labor market. Most importantly, such piecemeal findings defy the real world phenomenon where both recruiters and prospective employees are accelerating the use of internet as a marketplace for employment. In fact, past literatures have consistently found that internet recruiting benefits both prospective employees and recruiting organizations, both of whom will reap the benefits of matching jobs better (Williams et al. 1993).

I. Theoretical Framework

This paper aims at resolving such inconsistencies through focusing on the firms. In order to do so, it first examines the intrinsic features of internet recruiting. Although the internet can reach a large pool of applicants, for example, it tends to reach a *specific* pool of applicants. In particular, a potential applicant must have access to a computer, the internet, and must some sort of computing background. These people will tend to be the young, more affluent, and will tend to have higher education level. Such supply side demographical characteristics assure that a substantial portion of the pool is composed of applicants who are part of the skilled labor market. This tendency is fueled by the demand side economics, where substantial costs involved with internet recruiting discourage firms from seeking easily replaceable (i.e. unskilled) labor. Specifically, firms must pay for each job that they post using commercial job sites like Monster.com, where price per post will range anywhere from $150 to $400 for a 30-day post period. Although this is certainly less than what it would cost to advertise on, say, *The New York Times*, it is certainly more than the cost involved with putting a "Now Hiring" sign up on a local grocery store. For example, if a local Domino's Pizza wanted to hire a maintenance staff, the

managers will most likely post "For Hire: Maintenance Staff" on their windows rather than paying couple hundred dollars on Monster.com.

Based on the given premises, it is reasonable to rationalize internet recruiting as a reservoir for searching relatively "skilled" applicant. In other words, firms with high demand for skilled labor should be spending higher proportion of their recruiting budget online relative to other firms. These firms are likely to be service firms, like JP Morgan, whose employees are primarily composed of "skilled" labor. Since enhancing job opportunities for skilled labor – who have less trouble finding jobs to begin with – will not have a significant effect on alleviating unemployment at an aggregate level, such empirical data will provide a solid explanation as to why the internet has apparently been ineffective in enhancing the welfare of the labor market.

II. Methodology

Firms use both their company websites and commercial websites (e.g. Monster.com) to advertise available jobs. Although it is clear that almost all large companies use the internet for recruiting, the degree to which a particular firm spends on internet recruiting is very difficult to examine. Recruiting expenses are strictly managerial accounting figures, which, by definition, are not disclosed to external users. Even if the information were attainable through surveying a group of firms, the discrepancies in the reporting practices among firms for such non-standard accounting figure would likely muddle the data.

Despite these barriers to research, there was a reassuring point to my research. Since the goal of this research focuses on measuring the *relative* intensity in the use of internet recruiting among firms, it only requires comparative – not absolute – recruiting expense figures. Those figures are significantly easier to come about, and were gathered by the following method: Monster, Careerbuilder, and Yahoo Hotjobs – the top three commercial job search sites – were used to measure the number of jobs a given company advertises online. Dollar figures were attached to those jobs using the price guideline conveniently provided by the commercial job search sites, listed in Table I of Appendix. The data took into account "bulk-purchase" discounts.

On January 19th, JP Morgan had 237 jobs posted on Monster, 102 jobs posted on Careerbuilders, and 247 jobs posted on Yahoo Hotjobs. In order to approximate the firm-wide expenses on internet recruiting, we simply calculate the monetary value of these posts by multiplying the number of jobs by the price tag associated with each post. As it turns out, JP Morgan expensed nearly $153,000 per month on posting jobs on commercial job search sites. Comparing such figure to the monthly expense for The Gallup Organization, who spent $38,000 in the same month, might suggest some to conclude that JP Morgan spends heavily on internet recruiting. However, this might merely be due to the fact that JP Morgan is a larger firm. Indeed, JP Morgan employs approximately 95,000 employees in the United States, while the Gallup Organization employs around 2,000. In order to measure the amount a certain firm spends on internet recruiting while accounting for its size, we calculated the "Per Capita Internet Recruiting Expense" by divide the dollar amount by the total number of employees for each respective firm. The "Per Capita Internet Recruiting Expense" for JP Morgan came out to be $1.95, while the figure is $19.28 for the Gallup Organization.

Total of 67 U.S. firms were examined in this study, and careful attention was given to measure only the domestic values of each of the figures. To avoid variations in the quantity of job posts that might occur due to seasonal factors, each firm were measured twice on two different months, and the average value of the two were recorded. For most of the companies, the seasonal variations were not significant. After completion of the data collection process, firms

were categorized into three different business sectors: Service, Manufacturing, and Retail. The compiled data with median values and mean values of the "Per Capita Internet Recruiting Budget" for each sector can be found in Table II of Appendix.

This approach, admittedly, discounts some marginal costs involved with internet recruiting. Most importantly, it is important to understand that firms use their own websites to post jobs. Needless to say, this is not an insignificant portion of the recruiting expense for most companies. Fortunately, these figures are not essential to the study. While the cost to maintain a company job search engine may be a significant fraction of the internet recruiting budget, it functions more as "fixed" costs than "variable" costs, since it does not cost more to post more jobs on a company job search engine. Because vast majority of major firms in the United States – including all firms that we examined in this study – maintain a company job search function of some sort, this value can be treated as a fixed cost associated with all firms. Regardless of the intensity of company website use, all firms will likely face similar costs in building and maintaining "job search" functions for company websites. When comparing the *relativity* of internet recruiting expense among different companies, measuring the expenses for commercial sites will be sufficient.

III. Data

The tables below summarize the findings. Refer to Table II for the complete data set. It should be noted that some firms were classified outside the traditional categorical approach to better capture the nature of operations for the individual firms. For example, online retail firms, such as Amazon, were treated as a service firm, since its model of operations more closely conforms to that of a service firm than traditional retail firms.

Table 1a: Summary Figures

	Retail (17 Firms)	Service (28 Firms)	Manufacturing (21 Firms)
Median	$0.73	$4.02	$1.06
Mean	$1.28	$5.29	$2.57
Standard Deviation	$1.63	$5.62	$3.78

Table 1b: Statistical Analysis

T-Statistics (Retail & Service)	
Standard Error	1.130156
T-Value	3.955752
Degrees of Freedom	43
P-Value	0.000291

T-Statistics (Service & Manufacturing)	
Standard Error	1.345103
T-Value	2.022151
Degrees of Freedom	47
P-Value	0.048873

T-Statistics (Retail & Manufacturing)	
Standard Error	0.914865
T-Value	1.408269
Degrees of Freedom	36
P-Value	0.16763

It is also noteworthy that while there existed variations among firms in the same business sectors, our result indicates that service firms noticeably outspends on internet recruiting relative to manufacturing and retail firms. The data indicates, for example, that the median value of per capita internet recruiting budget among retail firms were $0.73, $4.02 for service firms, and $1.06 for manufacturing firms. The mean values of per capita internet recruiting budget for retail, service, and manufacturing firms were $1.28, $5.29, and $2.57, respectively. Rigorous statistical analysis indicates that there is indeed a statistically significant difference between figures for service firms relative to figures of retail and manufacturing firms. Interestingly, while there appears to be a significant difference in the mean value between retail and manufacturing firms, it is not a statistically significant difference.

IV. Analysis & Implications

Service firms, that require large amounts of skilled labor force, use the internet more intensively compared to retail or manufacturing firms. The data set is consistent with the earlier conjecture that internet recruiting is primarily a marketplace for skilled labor. JP Morgan, whose primary business is composed of providing financial services, needs a large pool of highly-skilled financial advisors, as well as Accounting Managers and Attorneys. On the other hand, it only takes a few administrators to manage retail firms like Wal-Mart, who are mostly composed of retail clerks. Manufacturing firms like the Campbell Soup Company, similarly, only require a handful of skilled labor – Majority of the factory workers require relatively few professional training. While mechanization among manufacturing firms decreased the need for unskilled labor force, the relative uses for skilled labor in these companies are still low compared to service firms.

While results are clearly important, it is crucial to explore the economic rationale behind such data. This requires one to review an important characteristic of internet recruiting: it reaches a specific, yet a large pool of potential applicants. Essentially, firms place different values on types of employees. Unskilled labor (i.e. jobs that are easily replaceable), by nature, tend to be

part-time jobs. Since they do not economically contribute to a given firm to the extent that full-time "skilled" labor forces do, they are not worth cherry-picking from a large number of qualified applicants. In other words, because the "unskilled" labor does not require high knowledge or long-term training, the *qualities* of applicants are not an important factor to take into account when hiring. On the other hand, a high school dropout cannot analyze accounting figures for JP Morgan. The point being, it is important for firms to hire management-level positions with highly skilled applicants, who tend to have a significant impact on the long-term welfare of many firms. The internet, which can reach a large pool of potential applicants who are younger and more educated, is a perfect place to find such employees.

This concept is worth explaining further. According to Salary.com, the median expected salary for a typical "Truck Driver" (i.e. unskilled labor) in the United States is $29,357. It also notes that the wage difference between the low 25-percentile ($25,016) and high 75-percentile ($33,439) of the job is $8,000. Compare this to, let's say, a Top Corporate Compliance Executive. The median expected salary for a typical "Top Corporate Compliance Executive" in the United States is $145,474, and the wage difference between the low 25-percentile and high 75-percentile for this job is more than $70,000. Although this is a simple example, these figures illustrate the fact that there is a lot more at stake for firms to seek out qualified applicants when hiring "skilled" employees.

This has significant macroeconomic implications, since the phenomenon reaffirms the notion that the internet indeed provides a venue for which both employers and employees can overcome the problems of imperfect and asymmetric information that often plagues the labor market. Widely cited in Economics literatures, decisions based on more complete information – in this case, provided by the internet – leads to a more optimal allocation of resources (Toikka 1974). The use of same scarce resources (i.e. the recruiting budget) for a more optimum output, translates into an increase in welfare at an aggregate level. However, since we know that this is mostly true for skilled labor, such welfare effect is likely to be most *visible* for service firms. Such welfare effect will not, as many scholars find, significantly affect the unemployment figures, precisely because the skilled labor forces do not have a hard time finding jobs in the first place.

V. Conclusion

Critics are delighted when economic theories, based on complex sets of assumptions, fail in light of the real world. Those critics have less to celebrate when it comes to the information-driven labor market. This paper was able to further identify the rationale for *why* internet has been seemingly ineffective in providing for a decrease in unemployment. One of the reasons, as articulated by Khun and Skuterud, is the mere fact that most internet job searchers are ones who do not require assistance of internet to find a job. However, such result is also driven by the fact that firms have an economic incentive to use internet recruiting to hire skilled labor forces. We were able to infer this from our data that indicate service firms record a disproportional amount of its recruiting budget on internet recruiting than manufacturing or retail firms. This study, however, is not intended, nor does it try, to prove that internet recruiting has no welfare effect. Internet recruiting is still a platform that enhances the efficiency for both employees and the employers. A note to add, however, is the fact that such effect is only visible in the skilled labor market, where internet recruiting has explicitly broadened the geographic scope of the labor market itself.

VI. Appendix

Table 1: Price for Posting Jobs Online ($ Per Post)

	Monster	Careerbuilder	HotJobs
1 Job	$395	$389	$299
2 Jobs	$375	$274.50	$269
3 Jobs	$350	$274.50	$269
4 Jobs	$325	$274.50	$269
5~9 Job	$300	$274.50	$224
10~14 Jobs	$250	$274.50	$203
15~24 Jobs	$250	$274.50	$191
25~29 Jobs	$175	$274.50	$173
30~49 Jobs	$175	$274.50	$158
50~1000 Jobs	$145	$274.50	$158

Table 2:   Per Capita Internet Recruiting Budget

	Retail	Services	Manufacturing
Wal-Mart	$0.01		
Starbucks		$2.74	
Amazon.com*		$19.56	
National City Bank		$0.41	
Best Buy	$0.61		
Circuit City	$0.73		
Campbell Soup Company			$1.57
Allianz Life		$0.10	
American Greetings			$1.08
American Eagle Outfitters	$1.34		
DHL Smart & Global Mail		$1.03	
Ebay, Inc		$5.84	
Epson America			$11.86
GateWay			$6.92
Dell			$1.14
Hertz Corporation		$1.68	
Hewitt Associates LCC		$8.53	
HDR, Inc		$9.40	
Henkel Corporation			$0.42
Haworth, Inc			$1.06
Home Depot	$3.24		
IKEA	$0.55		
JC Penny	$0.67		
J.P.Morgan Chase & Co.		$1.95	
Kia Motors America, INC*		$4.45	
Kroger	$0.03		
LandAmerica Financial Group, INC		$8.45	

Lowe's	$0.25		
Merrill Lynch		$4.12	
Nextel Partners, INC		$2.34	
OCE Business Services		$5.21	
Oracle		$1.63	
OfficeMax	$6.45		
Parsons			$5.34
Parker and Lynch			
The Phoenix Companies, Inc.		$7.25	
Progressive Insurance		$6.68	
Plantronics			$3.12
Panda Express		$3.92	
Pardee Homes			$0.34
Petco*		$19.10	
Purdue Pharma			$0.25
Novartis Pharmaceuticals Corporation			$13.19
Nike			$0.43
Nordstrom	$0.78		
QVC, Inc	$2.78		
Red Lobster		$0.32	
Rock Financial		$2.13	
Relizon		$1.34	
Sears	$0.26		
Staples	$2.09		
Texas Instruments			$0.00
Toyota			$0.63
Target	$1.07		
Ford Motor Company			$0.05
Universal Studios			$0.04
Hyundai Motor Company			$0.81
Yellow Book USA		$5.92	
Acosta Sales and Marketing Co.		$0.74	
Albemarle			$1.91
Barnes and Noble College Booksellers, Inc.	$0.96		
Bruno's Supermarkets Inc	$0.00		
Denny's Restaurants		$1.32	
Fifth Third Bank		$8.08	
L'Oreal USA			$3.57
Time, Inc			$0.28
The Gallup Organization		$19.28	
MEDIAN	**$0.73**	**$4.02**	**$1.06**
MEAN	**$1.28**	**$5.29**	**$2.57**
	17 Firms	28 firms	21 firms

*Kia Motors USA was treated as a service firm rather than a manufacturing firm, since it does not manufacture any products in the United States – rather, its main function is to import and perform customer services. Similarly, online retailers (Amazon.com and Petco) were also treated as service firms, since their model of operations is more similarly conforms to that of a typical service firm.

VII. References

Borjas, George. 2004. *Labor Economics.* New York: McGraw-Hill

Capelli, P. 2001. Making the most of online recruiting. *Harvard Business Revie*w 79: 139-46.

Hadass, Yael. 2004. The Effect of Internet Recruiting on Matching of Workers and Employers. http://econ.tau.ac.il/papers/applied/Hadass_paper.pdf (accessed June 12, 2007).

Hausdorf, P. and Duncan D. 2004. Firm Size and Internet Recruiting in Canada: A preliminary Investigation. *Journal of Small Business Management* 42 (3): 325-335.

Hays, S. 1999. Hiring on the Web. *Workforce* 78: 76-84.

iLogos Research. 2000. *Global 500 Web Site Recruiting 2000 Survey*.

Kuhn, Peter and Skuterud, Mikal. 2000. Job Search Methods: Internet versus Traditional. *Monthly Labor Review*: 3-11.

Leonard, B. 2000. Online and Overwhelmled. *HR Magazine* 45 (8): 36-42.

Mortensen, Dale T. 2000. Panel: Modeling Search-Matching Technologies Affect Labor Markets. Presentation to IRPP and CERF Conference on Creating   Canada's Advantage in an Information Age, Ottawa, Canada.

Toikka, Richard. 1974. The Economics of Information: Labor Market Aspects. *The Swedish Journal of Economics* 76: 62-72.

Williams, Charles R., Chalmer E. Labig, Jr. and Thomas H. Stone. 1993. Recruitment Sources and Posthire Outcomes for Job Applicants and New Hires. *Journal of Applied Psychology* 78: 163-72.