
How Much Is That Network Worth? Social Capital in Employee Referral Networks

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The notion of social capital has been applied to disparate phenomena ranging from job search (Flap & Boxman 1999) to economic development (Woolcock 1998). Perhaps inevitably, the concept has taken on a number of disparate meanings over the years (for recent reviews, see Adler & Kwon 1999; Burt 1998). Several scholars (e.g., Adler & Kwon 1999; Baron & Hannan 1994:1122–24) have questioned the utility of continuing with such a catholic approach in this area. In our research, we focus on one particularly important feature of the concept of social capital, the notion that it can yield returns on investment. We argue that if the term “social capital” is to mean anything more than “networks have value,” then we will need to demonstrate key features of the analogy to “real” capital. If “social” capital is like “real” capital, we should be able to isolate the value of the investment, the rates of return, and the means by which returns are realized.

We argue that a common organizational practice—hiring new workers via employee referrals—provides key insights into the notion of social capital. In our research (Fernandez et al. 2000), we examined social-capital investments and returns from the perspective of the employer. We argued that employers who use such hiring methods are quintessential “social capitalists,” viewing workers’ social connections as resources in which they can invest and gain returns in the form of improved hiring outcomes. The investment took the form of a referral bonus paid to employees who

refer workers who are subsequently hired; the returns are measured in real dollar impacts on hiring outcomes (savings on recruitment costs and lower turnover for referred than nonreferred hires).

In this chapter, we shift our focus to the *employee's* social-capital investment. Just as employers might reap benefits from workers' networks, individual workers might view their own networks as a source of instrumental value. This is especially likely to be the case for workers employed at a firm that offers referral bonuses for recruiting applicants. From the individual worker's perspective, the social capital investment takes the form of time and energy expended in referring candidates for employment, while the referral bonus constitutes the return on this investment. We examine data on all workers who were eligible to make referrals over the period of the study, and examine the determinants of referring. In order to assess the returns on referring, we use the referral bonus to calculate the expected value of referring. Although our measures of investment are indirect, we develop a model of workers' referring behavior in order to shed light on the nature of workers' investments in referral recruitment.

We begin by summarizing the results of the firm's social-capital investment in its referral program. We then shift to the perspective of the employee and discuss the value of the referral bonus for prospective referers. We then turn to the empirical data to estimate predictive models of who participates in the referral program. We conclude with a discussion of the implications of the model for our understanding of social capital.

THE FIRM'S INVESTMENT

In Fernandez et al. (2000), we studied hiring for entry-level customer service representatives at a telephone call center of a large financial services institution.¹ We used unique company data on the dollar costs of screening, hiring, and training of referrals and nonreferrals to identify the dollar investments and returns that the firm made by using referrals in their hiring process. We identified three mechanisms by which the firm could reap returns on these investments—i.e., the referrals produce a “richer pool” of applicants interpretation; the referrals are “better matched” argument, which is common within economics; and the referrals benefit from “social enrichment” of the workplace mechanisms, which is emphasized by sociologists.

To the extent that referred applicants constitute a richer hiring pool than nonreferrals, this suggests that it would take fewer screens to hire appropriate people from among a pool of referral applicants than it would nonreferral applicants. Thus, economizing on screening costs is one mech-

anism by which employers can realize returns from using the social capital of their employees during recruitment. In order to address the “richer pool” argument, we used data on the pool of applicants to entry-level jobs to test whether referrals show evidence of being more appropriate for the job at the application stage.

The “better match” theory posits a second mechanism by which employers may realize returns to their social capital investment: savings due to referrals' lower turnover. Here, the argument is that referrals should be better informed than nonreferrals about the more informal characteristics of the job. Since referrals would have a better sense of what the job entailed than nonreferrals, fewer referrals than nonreferrals would conclude upon experiencing the job that it is not for them and leave. We tested the “better match” interpretation of referral hiring by comparing the posthire turnover data for referrals and nonreferrals, and looking for evidence that referrals provide a conduit for information between the employer and the applicant.

Finally, the “social enrichment” explanation of recruitment via referrals argues that the connection between the new hire and the job is enriched by the existence of a prior friend or acquaintance that might ease the transition to a new job setting. This can increase workers' attachment to the firm, thereby lowering turnover and economizing on the costs associated with the training of replacements. We tested the “social enrichment” argument by examining data on interdependence between referrals and referers on posthire attachment to the firm.

We found evidence of both the “richer pool” and “social enrichment” processes, but very little evidence of the posthire “better match” explanation of referral hiring. Moreover, we gauged the firms' dollar returns associated with the referral program. Using their internal accounting data on the dollar costs of screening, hiring, and training, we identified the dollar investments that the firm made by hiring referrals and partitioned the dollar returns across the three mechanisms.

Table 1 summarizes the return on investment calculations we made with respect to the referral program. The firm invests \$10 for each referral who is interviewed, and \$250 for each referral who is hired and remains with the firm 30 days. Each applicant screen (paper screening plus short telephone interview) cost \$7.00. On a per-hire basis, screening costs for referrals are \$63.33, interview costs are \$701.75, and offer costs are \$212.87, for a total of \$977.95 per hire. The corresponding figures for nonreferrals are \$117.15, \$1,055.29, and \$221.94, for a total cost per hire of \$1,394.37. The total difference between referrals and nonreferrals is \$416.43 per hire; 85 percent of the savings are associated with the interview stage. The \$416.43 difference yields a 66.6 percent return on the firm's \$250 incremental out-

Table 1. Per-Hire Dollar Savings Associated with Hiring Referrals via the "Richer Pool" Mechanism for Each Stage of the Hiring Process

Application Screening Stage	Referrals		Nonreferrals		Referrals	
	Screens per Hire	Cost per Hire	Screens per Hire	Cost per Hire	Savings Per Hire	Savings Per Hire
Cost: \$7.00 per screen	9.043 @ \$7.00 = \$63.33		16.735 @ \$7.00 = \$117.15		\$53.82	
Interview Stage	Interviews Per Hire	Cost Per Hire	Interviews Per Hire	Cost Per Hire	Savings Per Hire	Savings Per Hire
Cost: \$120 (referrals) \$110 (nonreferrals) Per interview	5.846	\$701.75	9.596	\$110.00	\$1055.29	\$355.54
Offer Stage	Offers Per Hire	Cost Per Hire	Offers Per Hire	Cost Per Hire	Savings Per Hire	Savings Per Hire
Cost: \$200.00 per offer	1.064 @ \$200.00 = \$212.87		1.110 @ \$200.00 = \$221.94		\$9.07	
Total costs per hire		\$977.95		\$1394.37	\$416.43	
Referral bonus (investment)		\$250.00				
Total costs		\$1227.95		\$1394.37	\$166.43	
Net benefit: \$166.43, or 66.6 percent return on investment						

lay in the form of the referral bonus. Thus, we found that the firm's social capital investment was justified based on the prehire "richer pool" process (for details of the cost accounting, see Fernandez et al. 2000).

We also considered the posthire "better match" and "social enrichment" processes. To the extent that there were returns associated with these mechanisms, they should have manifested themselves in referrals showing lower turnover rates. However, our analyses of turnover differences associated with recruitment source showed no practical or statistically reliable return on the \$250 investment vis-à-vis the "better match" mechanism. We did find evidence of the social enrichment process. The firm, however, did not reap any financial benefits via this mechanism. Overall, referrals did not differ from nonreferrals in turnover, but there was significant heterogeneity among referrals in turnover depending on the behavior of their referrer. Referrals whose referrer leaves showed an annual replacement cost of \$3,129, not including the cost of replacing the referrer. Referrals whose referrer stays had an annual replacement cost of \$1,633. Thus, if a new hire were to be converted from the "referrer leaves" to a "referrer stays" category, the bank would save \$1,496 in replacement costs. When considered

in relation to the investment of \$250, these savings in replacement costs would indicate very large returns. However, because the firm did not make any attempt to manage the social enrichment process (e.g., by attempting to break the relationship between referrers who are likely to leave and their referrals), the \$1,496 figure represents *potential* savings that the firm does not currently realize (for further details, see Fernandez et al. 2000).

THE REFERRER'S PERSPECTIVE

Just as the referral program may be seen as an investment that yields returns for the firm by saving on hiring costs, the referral program may also be analyzed as a social capital investment from the point of view of a person employed at the phone center. From the referrer's perspective, the referral bonus can be seen as returns (compensation) for the referrer's use of his/her social capital (i.e., network of acquaintances) on behalf of the firm.

The management at the phone center offered bonuses to employees who referred friends or acquaintances for customer-service representative positions. The firm pays the employee \$10 for suggesting a candidate who is interviewed, and \$250 if the candidate is hired and stays with the company 30 days.² Table 2 reports information on the rate at which the firm paid out these bonuses over the two-year period of our study. The top panel shows that nearly 65 percent of applicants who are referred are granted interviews (for details of the analyses, see Fernandez et al. 2000). Thus at the interview phase, the expected value for employees' referring is \$6.48. However, the bottom panel shows that a much lower percentage of referral attempts pay off in the \$250 bonus: only 10.9 percent of referred applicants are hired and last the required 30 days. Ninety-four percent of those

Table 2. Expected Value Payoffs for Referring Applicants to Firm

	Bonus (If Applicant Is Successful)	Probability of Applicant Success	Expected Value
1. Interview bonus (Interview/Application)	\$10	.648	\$6.48
2. Hire and 30 day bonus (Offer/application) (Hire/offer) (30 days/hire) (30 days/application)	\$250	.119 .940 .971 .109	\$27.14
Total	\$260		\$33.62

who are offered jobs are hired, and 97.1 percent of hires stay with the firm 30 days; however, only 11.9 percent of referred applicants are initially offered jobs. From the referring employee's perspective, the firm's second bonus program yields an expected value of \$27.14. Thus, the total value of the programs to an employee who refers a successful candidate (i.e., *ex post*) is \$260; the *ex ante* value of the program to a referring employee is \$33.62.

Of course, these are average payoffs, and there is certain to be variation in the chances of receiving the payoff. Indeed, the structure of the program creates an incentive for referrers to "game" the bonus system. While management's and referrer's incentives may be aligned in some cases (e.g., by referrers attempting to influence the referral, thereby raising the probability that the referral will accept the job), this is not necessarily the case. If, in pursuit of the bonus, referrers attempt to influence recruiters' screening decisions (interview or offer) such that recruiters are passing unqualified people on (who would otherwise be rejected), then the firm might be suffering adversely from the effects of the bonus program. Indeed, one of the firm's recruiters expressed just such a concern in an interview with us.³ Similarly, referrers who attempt to influence the propensity of the referral to stay at least 30 days are well aligned with management's interests, as long as the attempt is not to get the referral to delay his/her departure until the thirty-first day.

We examined the data for evidence of such gaming behavior. Despite the fact that recruiters seem to prefer referral to nonreferral candidates, we know that recruiters do not communicate with referrers while screening applicants for interviews or offers (see Fernandez et al. 2000). At least with respect to influences on the recruiters, we find no evidence of such attempts. Regarding the later phases (offer acceptance and turnover) of the bonus payout criteria, we think the available evidence casts doubt on this too. Neither the acceptance rate of job offers nor the percent of hires staying 30 days differs significantly for nonreferrals and referrals (90.1 vs. 94 percent for job offers and 98.1 vs. 97.1 percent of hires staying 30 days; see Fernandez et al. 2000). If there are attempts to influence the referral in order to reap the bonus, they appear to have failed in this context.

Our analyses thus far have identified a total potential return for referring of \$260. In order to reap this payoff, however, referrers need to invest time and energy in recruiting customer-service representative candidates. We are limited in our ability to measure the degree of investment since our dataset does not contain direct measures of the amount of time and resources that referrers expend in recruiting referrals. We gain some insight into the nature of this investment, however, by studying the determinants of referring behavior. To our knowledge, these data are unique in their abil-

ity to address factors that distinguish employees who refer from those who do not refer applicants.

Who Refers?

As we showed in Table 2, the referral program in this context is structured in such a way that the expected value of referring applicants is \$33.62. However, the vast majority of employees at the phone center passed up the opportunity to claim the referral bonus: 70.3 percent (2,891 of 4,114) of the people employed at the phone center did not refer anyone during the period of the study. What distinguishes those who refer from those who do not?

If referring behavior is understandable as a type of investment, we conjecture that the cost of recruiting applicants is likely to be an important determinant of referring.⁴ The most important cost in this setting is likely to be the time needed to identify recruits and convince them to apply. Economists typically measure the value of time by an individual's wage rate (Winship 1983). Wages might also index structural accessibility to appropriate candidates since high-wage workers might be less likely to know people who would be interested in applying for a low-wage, entry-level job. Indeed, the evidence we found showing homophily between referrers' wages and applicants' wages on their last job (Fernandez et al. 2000) supports this inference. Thus, both these arguments would predict that high-wage employees would be less likely to refer applicants than low-wage workers.⁵

In addition to low wages, in this setting, structural accessibility to potentially fruitful referrals is likely to be associated with two other factors. First, workers who themselves had been hired as a referral are likely to have better access to appropriate job candidates. Because these workers have been recruited as referrals themselves, the referral program is likely to be more salient to such workers, and should better understand the nature of the referral recruitment process than nonreferrals. Also, such workers are more likely to be embedded in referral networks, and thus better positioned to suggest applicants.

The second factor affecting access is whether or not the person had ever worked as a telephone customer service representative for the bank is also likely to predispose workers to referring candidates to the CSR position. There is clear evidence that people tend to refer people like themselves in this setting (Fernandez et al. 2000); thus, former customer service representatives should be more likely to know people who might be interested in CSR positions. In addition, having done the job themselves, such workers should be better able to explain the job to potential candidates.⁶

Unlike the time-value rationale discussed above, we think that having been a referral or a CSR are unlikely to be conscious investments in social capital. This does not mean, however, that such statuses do not yield value for the employee in this setting. While we think it is implausible that the prospect of garnering a referral bonus would play a large role in employees' choosing these statuses, it is possible that workers consider the chances of winning a referral bonus as a kind of fringe benefit when deciding between jobs at different firms. Irrespective of how calculated the choice of these statuses has been, once workers are in these positions, they are much better positioned to refer others and pursue referral bonuses.

Thus far, the arguments suggest that the effects of wages and structural access on referring will be analytically separate. While the time costs of seeking out appropriate people are likely to be greater for people who are structurally less well-connected, for a given time cost (wage), the rate of referring should be higher for people who are more likely to be connected to appropriate applicants (i.e., referrals and former CSRs). This relationship between wages and referral and CSR statuses is important because it gives us a way of estimating the social capital value of structural access in this setting (see below).

It is also plausible, however, that the effects of accessibility and wages will combine as determinants of referring. Because access can shorten the time requirements for recruiting referrals, structural access could *substitute* for time in producing referrals, yielding a negative interaction between wages and access. Thus, the effect of wages on referring will depend on the level of structural access: As wages decrease, the payoff in terms of the referring rate will be much greater for structurally connected than disconnected individuals. While this predicted interaction complicates the analyses we present below, it allows us to address the contingent nature of the social capital value of structural access in this setting.

Data and Measures

In order to test these predictions, we assembled a time-varying data file for all workers at risk of referring an applicant to a telephone customer-service representative job over the period of the study. We were successful in coding data for 96.4 percent (3,968 of 4,114) of the workers employed at the phone center. There were no limits on the number of applicants a person could refer,⁷ and the number of referrals per referrer varied between 1 and 6 (although 79.7 percent referred only one, and 15.8 percent referred two applicants). A total of 1,546 referral applications were produced over the two-year period under study, and we were able to locate the identity of the referrer and the date of the referral for 90.2 percent (1,395) of the referral applications.

We estimated Weibull event history models treating the dependent variable—making a referral—as a repeated event.⁸ We included three sets of variables among the predictors in these models. First, we measured worker's hourly wages. As we discussed above, wages might index both time-value and structural access. Since wages varied over the two-year period of the study, we coded hourly wage as a time-varying covariate. Second, we coded two measures of individual's structural access to hireable applicants. We coded a dummy variable for whether the worker had himself been hired as a referral. The second structural-access variable we use is a dummy variable for whether or not the person had ever worked as a telephone customer-service representative for the bank.

The last set of factors we included in the model for referring were control variables for individual background characteristics. We distinguished gender with a dummy variable (1 = female), and coded the individual's age at the earliest time that he/she appeared within the two-year observation window. We also measured minority status as a dummy variable, coded 1 for African Americans, Hispanics, Native Americans, or Asians, and 0 otherwise. Marital status at time of hire was coded as a dummy variable 1 = married, and 0 otherwise. Finally, we measured education with two dummy variables, the first for whether the person has a Bachelor's degree (1 = BA and 0 otherwise), and a second dummy variable for 2 years of college (1 = 2 years of college, 0 otherwise).⁹

Results

Model 1 of Table 3 presents a simple repeated event Weibull model predicting referring, ignoring potential interaction effects. While we did not present hypotheses about their effects, the control variables show several interesting relationships with referring. Controlling other factors, we find that minorities are more likely to refer candidates than nonminorities. Minorities might be using the referral program to increase their representation in the company. We cannot be sure of this, however, since applicants do not list their race or ethnic background on the applications, and so we cannot tell whether minorities' referrals are homophilous with respect to race (i.e., whether minority employees are more likely to refer minority than nonminority candidates).¹⁰

We also found that married workers are more likely to refer than those who are not married. Here, too, since applicants do not list their marital status on the application form, we cannot be sure whether this pattern is due to a tendency for workers to refer people like themselves. The coefficient for age, however, shows that older workers are less likely to refer applicants than are younger workers. This is consistent with the general tendency for network size to decrease with age (see Burt 1991). It might,

Table 3. Weibull Models Predicting Referring as a Repeated Event^a (Standard errors in parentheses).

	1	2
Gender	.092 (.084)	.105 (.084)
Age (in years)	-.039* (.005)	-.037* (.005)
Minority status (1 = minority)	.417* (.166)	.393* (.164)
Marital status (1 = married)	.128* (.072)	.123* (.072)
Education (1 = BA)	-.039 (.127)	-.037 (.126)
Education (1 = AA)	-.099* (.213)	-.153 (.215)
Hourly wage ^b	-.099 (.019)	-.078* (.017)
Referral	1.451* (.102)	2.079* (.419)
Customer service representative	.324* (.071)	2.094* (.364)
Hourly wage ^b × referral		-.078* (.046)
Hourly wage ^b × cust. serv. rep.		-.181* (.037)
Constant	-3.821* (.278)	-4.215* (.293)
Weibull rho parameter	1.127* (.035)	1.152* (.035)
χ^2	535.710	622.180
d.f.	9	11
<i>p</i>	<.00001	<.00001
<i>N</i>	3,946	3,946
Referrals made	1,391	1,391

**p* < .05, one-tailed test.

^aStandard errors in parentheses.

^bTime-varying covariate.

however, also be due to the fact that the customer-service representative position is an entry-level job. Regardless of network size, young people are likely to have an edge in knowing people who are specifically seeking such jobs.

Turning to the main variables of interests, we find that, controlling other factors, high-wage workers are significantly less likely to refer people than are low-wage workers. This result plausibly reflects two distinct tendencies. First, it could be that high-wage workers are simply less likely to know

people who might be interested in an entry-level job in their network. Second, the value of time for high-wage workers is greater than for low-wage workers, so the incentive level of the referral program (*ex ante* \$33.62, and *ex post* \$260) is likely to be too low to encourage high-wage workers to search very much for new candidates.

Consistent with our predictions with respect to structural availability, Model 1 also shows that having been hired as a referral and having worked as a CSR are both positively associated with referring. This supports the idea (discussed above) that a favorable structural position dramatically lowers the costs of proposing referral candidates. Finally, the *rho* parameter is significantly greater than 1, implying that the baseline hazard of referring is increasing with increased exposure, i.e., the longer people are employed at the phone center.

We examined the data for evidence that structural availability can act as a substitute for wage in producing referrals. In Model 2, we added interaction terms for the access variables (referral and CSR) with wage to the regressors. A chi-square test of the contrast between Models 1 and 2 shows a significant improvement in fit (LL chi-square 86.47, with 2 d.f.). Moreover, both interaction terms are in the predicted direction (i.e., negative) and individually statistically significant ($p < .05$, one-tailed test). The pattern of effects for the control variables does not change with the introduction of the interaction terms. However, the interactions substantially alter our interpretation of the impact of wage on the propensity to refer. Model 2 shows that low-wage workers who are not themselves referrals or present or former CSRs are significantly more likely to refer people than similarly disconnected high-wage workers (main effect of wage $-.078$). The propensity to refer, however, is much stronger for low-wage referrals (double, in fact; the main effect of $-.078$ + referral by wage interaction of $-.078$) and low-wage CSRs (main effect $-.078$ + CSR by wage interaction of $-.181$). The intercept shifts for referral and CSR greatly increase over those in Model 1. When considered in combination with the interaction terms, these patterns suggest that the chances of referring are highest for low-wage referrals who are also CSRs, and that as wages increase, referring falls off at a steeper rate for referrals who are CSRs than for nonreferral, non-CSR employees.

In order to explore the implications of these results, and to get a better sense of the magnitudes of the effects implied by the model, we plotted the predicted probabilities of referring at least once (recall that referring is a repeated event) based on Model 2 (see Figure 1).¹¹ We plotted wage-referring profiles for four groups based on their levels of structural access to candidates: (1) referral, CSR; (2) referral, non-CSR; (3) nonreferral, CSR; (4) nonreferral, non-CSR. Wages at the phone center ranged from a low of \$5.25 to \$100 per hour, although the distribution is very skewed to the left, with a

median wage of just \$9.10. We plotted the model predictions for wages from the 5th percentile (\$6.50) to the 95th percentile (\$22.00), indicating on the x-axis of Figure 1 where the 25th, 50th, and 75th percentiles fall.

The first thing to notice is that curves for all four groups are downwardly sloping with increasing wages. As we argued above, this could be due to a rational calculus with respect to time investment due to an increasing opportunity cost of time, and/or the lower levels of access that high-wage workers may have to appropriate candidates. The second obvious pattern is that the curves start from dramatically different points, and show very different rates of decline as wages increase. Those with the most access to potential hires—referrals who have been CSRs—are most responsive to the effects of wages on referring, while those in the least favorable structural position—nonreferral, non-CSRs—are least responsive to changing wages.

Further examining Figure 1, we see that differences in referring associated with CSR status virtually disappear by the 75th percentile of the wage distribution. For referrals, the curve for CSRs starts at about 56 percent, and declines to about 14 percent by the 75th percentile of the wage distribution, while the non-CSR curve begins lower (25 percent) and declines more slowly, crossing the 75th percentile of the wage distribution at about 12 percent. For nonreferrals, the CSR curve starts at about 12 percent, declining to 3 percent by the 75th percentile, while the non-CSR curve begins at 4.6 percent and declines to about 3 percent at the 75th percentile. In contrast, referral/nonreferral differences in referring are even larger at the beginning (56 vs. 12 percent for CSRs and 25 vs. 4.6 percent for non-CSRs), and remain substantial at the 75th percentile of wages (14 vs. 3 percent for CSRs and 12 vs. 3 percent for non-CSRs).

These findings have important implications with respect to workers' social capital investments and rates of return. Since, in the limit, the chances of receiving the referral bonuses are nil for people who do not know anyone to refer, the incentive argument would suggest that we should see a flat relationship between wages and referring as we approach this limit. Consistent with this argument, the chances of referring are indeed quite low for low-wage, nonreferral, non-CSRs (i.e., 4.6 percent for workers earning \$6.50 per hour), and the wage-referring profile stays relatively flat as wages increase. While we cannot in the present study separate the accessibility and incentive components of wages (see note 5), these findings are consistent with a central implication of a social capital approach to referring, i.e., at least some part of the wage effects reflect people's responses to monetary incentives for referring.¹² To the extent that monetary incentives are a determinant of referring, they appear to be more important for referrals than nonreferrals.

These findings also suggest that differences in the effects of wages be-

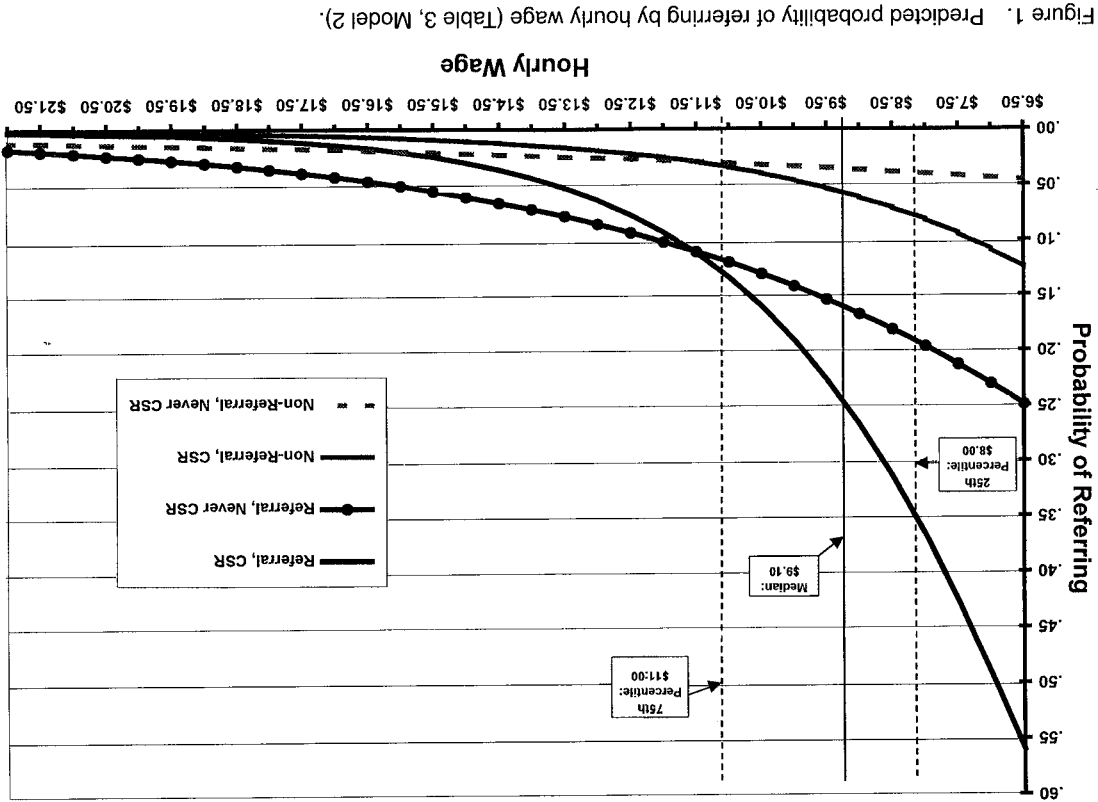


Figure 1. Predicted probability of referring by hourly wage (Table 3, Model 2).

tween referrals and nonreferrals and CSRs and non-CSRs also translate into variation in rates of return to social capital investments in this setting. Since we did not find individual differences in the *benefits* of referring (the numerator in a rate-of-return calculation; see note 4), the differences in the effects of wages across these various groups reflect variation in the underlying costs of referring (the denominator). Without direct measures of time invested in referring, we cannot offer precise estimates of rates of return. We can, however, use the model to make some educated guesses with respect to the relative value of referral and CSR status under differing assumptions about the meaning of the wage effect.

Whether wages are indexing time-value, class-based access to eligible others, or both, the value of referral and CSR statuses appear to be substantial. Assuming for the moment that all of the wage effects reflect differences in time-value, then the differences in referring rates between referral, CSRs and nonreferral, non-CSRs suggest that the former group can produce a referral at much faster rates than can the latter group. At a time-value of \$6.50 per hour, it is rational to invest a little over 5 hours (Expected value of \$33.62 / \$6.50 per hour = 5.17 hours) to searching for a referral. At a wage of \$6.50, however, referral, CSRs produce referrals at over 12 times the rate of nonreferral, non-CSRs (referral rates of 56 percent vs. 4.6 percent). Even at higher wages, the difference in referring rates remains substantial. For example, at \$11.00 (i.e., the 75th percentile of the wage distribution) the referring rate of referral, CSRs is 4.4 times that of nonreferral, non-CSRs (13.3 vs. 3.0 percent). Only above the 90th percentile of these distribution (i.e., \$16.10) do the differences in referring rates between these groups wholly disappear. These results suggest that referral, CSRs are much more time-efficient in their search for referrals than are nonreferral, non-CSRs.¹³

On the other hand, if wages were to measure only access to candidates interested in an entry-level job, we can use the hourly wage metric to measure the implied value of referral and CSRs statuses. In this case, levels of access associated with wages appear to extend to much-better-paid referral, CSRs than nonreferral, non-CSRs. We take the act of referring someone as evidence of access to appropriate people. Using the referring rate of nonreferral, non-CSRs as the threshold for evidence of access (i.e., 4.6 percent referring rate), we find that referral, CSRs show the same level of access at relatively high wages (\$13.75, or the 86th percentile of the wage distribution) that nonreferral, non-CSRs do at quite low wages (\$6.50, or the 5th percentile). Nonreferral, CSRs, show a 4.6 percent referring rate at a somewhat lower wage of \$10.00 per hour (i.e., the 64th percentile). Thus, if high wages are cutting off people from social circles containing potential entry-level employees, the isolating effects of wages are very different for nonreferrals than referrals, and CSRs than non-CSRs. Setting the threshold for

evidence of access lower (e.g., a referring rate 3.0 percent) narrows the wage gaps for the various groups,¹⁴ but it is safe to conclude that any wage-based isolation from networks of potentially hireable candidates is considerably tempered by having been a referral or a CSR.

SUMMARY AND CONCLUSION

We have argued that a common organizational practice—hiring new workers via employee referrals—provides key insights into the notion of social capital. Employers who use such hiring methods are quintessential “social capitalists,” viewing workers’ social connections as resources in which they can invest, in order to gain economic returns in the form of better hiring outcomes. Similarly, employees referring potential hires may also be regarded as attempting to garner social capital returns from connections. We began by summarizing our analyses of the employer’s social capital investment and returns (Fernandez et al. 2000). We identified three ways through which such returns might be realized: the “richer pool,” the “better match,” and the “social enrichment” mechanisms. Using unique data on hiring from a bank’s credit-card phone center, we found support for the “richer pool” process. Conversely, we found scant evidence for the posthire “better match” theory. We did, however, find evidence supporting the “social enrichment” process. Consistent with our prediction, we observed interdependence of turnover between referrers and referrals, a process that is not predicted by the socially atomistic “better match” theory.

We employed company data on the dollar costs of screening, hiring, and training to estimate the firm’s investment and returns in the social capital of its employees. We found that the referral program yields significant economic returns for the company. These returns are realized by savings in screening costs due to referrals being more appropriate for the job at application (i.e., the “richer pool” mechanism). The firm’s \$250 investment (in the form of a referral bonus) yields a return of \$416 in reduced recruiting costs, a rate of return of 67 percent. While there is a clear evidence of a net benefit to the firm in recruiting referrals via the “richer pool” process, we found that the “better match” process does not produce significant returns to the firm’s social-capital investment. While we did find evidence of the social-enrichment process at work in the phone center, the firm was not managed in such a way as to reap any financial benefits via this mechanism.

We then turned to the employee’s perspective. We first assessed the payoffs associated with referring. We estimated the probabilities of receiving the referral bonuses (\$10 for candidates who are interviewed, \$250 for hires

who remain with the company at least 30 days) to calculate the expected values of referring candidates to the customer-service representative position. The expected value of the interview-based bonus is \$6.48, and the expected value of the posthire bonus is \$27.14. Thus, the *ex ante* value of the referral program to potential referrers is \$33.62, while successful referrers receive a total bonus of \$260.

We then addressed the issue of the investment required to obtain these benefits. Although we do not have direct measures of time and effort expended in searching for referral candidates, we gained insight into the nature of the investment by studying the determinants of referring. We assembled data on all workers who were eligible to make referrals over a two-year period, and develop an event history model of referring, treating referring as a repeated event. We found that *ceteris paribus* low-wage employees—who would find the bonuses most valuable—are more likely to refer than high-wage employees. However, this wage effect was much stronger for those in better positions to refer appropriate applicants, i.e., those who had themselves been hired as a referral or worked as a CSR. Low-wage employees lacking these characteristics refer others at very low rates, and decrease their referral rates very slowly as wages increase. Such a pattern—low rates of participation for low-wage workers and a lack of sensitivity to increasing wages—is consistent with the idea that at least part of the motivation for referring is a response to the incentives offered by the referral bonuses. Even though the value of low-wage workers' time is quite low, and would therefore justify more hours of search for referral candidates, the incentive effects of the referral bonus are nil for nonreferral, non-CSR workers since they are poorly positioned to suggest appropriate candidates.

If we are correct that at least some of the referring behavior we observe can be understood in instrumental terms, then we may draw some tentative conclusions with respect to workers' investments in social capital. First, if the use of one's social network for the company is motivated by the pursuit of the referral bonus, then our results suggest that the incentive effects of the bonus are highly contingent. At least in this setting, investment—and returns—to social capital vary dramatically for people in different structural positions. This finding might be seen as an illustration of a more general principle deriving from expectancy theories of motivation: If you don't think you have a chance to get a reward, then the reward is not motivating (Lawler 1973).

These analyses also showed that occupancy of favorable structural positions (in this case, referral and CSR statuses) yields great value for their incumbents, although occupancy of these positions is not likely to have been produced by the conscious pursuit of the referral bonus. We have noted that the use of the term "social capital" in connection with social net-

work processes focuses attention on notions of investment and return, i.e., on the instrumental uses of social relationships. In this case, however, value (in terms of improved chances of receiving the referral bonus) is apparently accruing to well-positioned individuals, without such people having instrumentally chosen those positions. Most likely, these people have discovered the instrumental value *vis-à-vis* the referral bonus after they found themselves in these positions. Absent the instrumental pursuit of these positions, we think it is misleading to think of occupancy of these positions as *investments*, and any advantages accruing to their incumbents as *returns* attributable to the positions themselves.

We do, however, think it is reasonable to regard the *effort expended in the search* for a referral candidate as a social capital investment to the extent that such search behavior is driven by the pursuit of the referral bonus. This distinction is not merely semantic. As we have previously argued (Fernandez et al. 2000), in order to avoid the confusion that has resulted from the casual use of the concept of social capital, researchers using the term should specify the investment and the mechanisms by which social actors realize returns. In this setting, it was possible that people in referral and CSR positions might have received higher returns by using their positions to raise their chances of receiving the bonus, thus raising the numerator of the rate of return calculation. While we found no evidence of this having occurred, we argue that it would be the purposive action of influencing the bonus system that should be thought of as the investment. In this setting, we think that referrers achieve returns by a different mechanism. Occupancy of referral and CSR positions serves to facilitate search, resulting in a greater return for the incumbents of these positions by lowering the denominator (search costs) in the rate of return calculation.

In conclusion, these findings illustrate something quite general about the nature of social networks as social capital. While network phenomena may invoke a variety of forms of social action (see e.g., Blau 1964), a hallmark of social capital is the mean-ends rationality that Weber (1978 [1922]) identified as associated with action in markets. We suggest that the benefits of applying the term social capital to network-related processes are most likely to outweigh the costs of using the term the more clearly the analysis addresses "investment for return" phenomena. We think our analysis of the firm's and referrer's sides of referral hiring provides an excellent example of one such instance.

NOTES

1. We refer the reader to Fernandez et al. (2000) for the details of the data collected for this project. In brief, we collected data on over 4,100 external ap-

applications for telephone customer-service jobs over a two-year period (January 1995 through December 1996) and tracked turnover for 325 people hired during this time frame. Over 1,500 of the applications were referrals, and we know the identity of the referrer for a very high percentage of the referral applications. Most important for this study, we also collected data on all workers employed at the site over the period of the study, and identify whether they participated in the company's referral program for customer service representatives.

2. Note that applicants cannot be hired without an interview.
3. This recruiter was concerned that referrals from referrers who are just doing it for the money would be worse than nonreferral applications. In her words: "I know people who would refer their dog if they can get a \$250 bonus."
4. While we focus on the *costs* of referring in the analyses that follow, it is also theoretically possible for there to be individual differences in the *benefits* of referring; i.e., for the same costs of referring, individuals might differ in their chances of receiving the referral bonus. We found no evidence of systematic variation in the extent to which individuals receive the referral bonus once they have referred someone (see the discussion above regarding "gaming"). Moreover, we found no evidence that referrer's characteristics were significantly related to success at the interview and offer stages (Fernandez et al. 2000). In light of these findings, we feel confident that referring is largely determined by costs in this setting.
5. Ideally, we would like to separate the time-value and structural-accessibility effects of wages by observing the intensity of the search for referrals by employees with different wage rates (for a given wage, individuals who are structurally disconnected should devote fewer hours to search). However, we do not directly observe search effort, and thus cannot separate these two effects of wages in this study. Note, however, that the distinction between these two components of wages is less important from the firm's perspective. For either reason, the firm can expect that high-wage employees will be less likely to produce good referral candidates.
6. While this latter point seems plausible, we found scant evidence that referrers were explaining anything to referrals in this context. Referrals were no better informed than nonreferrals about key features of the job (e.g., starting wages and schedules) than nonreferrals (Fernandez et al. 2000).
7. While the referral bonus program was widely available to workers working at the firm, fewer than 10 of the 4,114 people employed at the phone were barred from participating in the program. Managers who have hiring authority cannot claim a referral bonus for someone who winds up working for them (they could, however, refer people to other shifts). Second, human-resources personnel who screen applicants for the job cannot participate in the referral program. Due to data limitations, we could not identify these workers in order to exclude them from the set of people at risk for referring. In light of their small numbers (less than 0.2 percent), we ignore this limitation of the data in the models we present below.
8. We also experimented with Cox regression models (with repeated events)

which, unlike Weibull models, make no assumptions about the time pattern of the hazard rates. Those analyses yield very similar results to those we present here. We present the Weibull models here because, unlike the Cox model, we can use the parameters of the Weibull model to generate predicted values (see note 11).

9. The tendency to associate with others like one's self (i.e., the homophily principle) suggests that all of these background characteristics might influence structural availability. Likewise, these variables may also affect individuals' time-value calculations (e.g., leisure time may be more important to married people). We explored the possibility of interactions between the background control variables and our measures of time-costs and structural availability in preliminary analyses. At least with respect to referring behavior, we find little evidence of significant interactions; consequently, we have used a simple linear specification for the effects of these variables.
10. We did, however, find evidence of racial homophily between referrers and those who were ultimately hired in this setting, as well as another unit of the bank (see Neckerman & Fernandez 1998).
11. Note that the model is highly nonlinear. In order to generate these predictions, we evaluated the model at the mean for age (i.e., 33.1 years), and the modal categories for the dummy independent variables (i.e., males, who are nonminority, married, but without a BA or AA degree). We set the time multiplier (ρ) to the length of the observation window for our data, i.e., 24 months.
12. On the other hand, we still cannot be sure that the wage effects reflect *only* monetary incentives. Although the curve for nonreferral, non-CSRs is *relatively* flat, it still shows a declining pattern with wage (see the main effect of wage in Model 2).
13. Of course, it is also possible that, despite having equivalent wages, referrers value their time at much lower rates than nonreferral, non-CSRs. While we cannot rule out this possibility without data on actual search activity for referrals, we think that time efficiency is a much more plausible interpretation of these differences.
14. A higher threshold for evidence of access would, of course, widen these differences. Note, however, that this would involve using wage rates that are lower than those observed in our data for nonreferral, non-CSRs.

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