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The Strength of Weak Ties in MBA Job Search: A Within–Person Test

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Abstract: Whether and how social ties create value has inspired substantial research in organizational theory, sociology, and economics. Scholars generally believe that social ties impact labor market outcomes. Two explanatory mechanisms have been identified, emphasizing access to better job offers in pecuniary terms and the efficacy of non-redundant information. The evidence informing each theory, however, has been inconsistent and circumstantial. We test predictions from both models using a rich set of job search data collected from an MBA student population, including detailed information about search channels and characteristics of job offers. Importantly, we can compare offers made to the same student derived via different search channels while accounting for industry, function, and non-pecuniary characteristics. We find that contrary to conventional wisdom, search through social networks typically results in job offers with lower total compensation (-17 percent for referrals through strong ties and -16 percent for referrals via weak ties vs. formal search). However, our models also show that students are considerably more likely to accept offers derived via weak ties. They do so because they are perceived to have greater growth potential and other non-pecuniary value. On balance, our tests are consistent with Granovetter's argument that networks provide value by facilitating access to information that is otherwise difficult to obtain, rather than providing greater pecuniary compensation.

Keywords: economic sociology; organizational sociology; networks; social capital; job search; business school

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WHETHER and how social ties create value has animated substantial research in sociology, organizational theory, and economics (Burt, Hogarth, and Michaud 2000; Mizruchi, Brewster Stearns, and Fleischer 2011; Portes 1998). Among the most active lines of research in this area are studies about whether social ties improve labor market outcomes. Sociologists and labor economists have long been inclined to believe that to an important degree it is, "not what but who you know" that counts (Granovetter 1973; Mortensen and Vishwanath 1994; Myers and Shultz 1951; Rees 1966). However, the evidence informing this belief is circumstantial (Durlauf 2002; Fernandez and Galperin 2014; Mouw 2003, 2006) and often inconsistent (Granovetter 1995; Marsden 2001). Moreover, it is not clear how social ties provide value in job search. First, they may increase the *probability* that individuals receive and accept employment offers (e.g., Granovetter 1973, 1983, 1995 [1974]). Second, social ties may lead to *better* jobs in terms of higher initial wages (e.g., Bridges and Villemez 1986; Marsden and Gorman 2001). Third, they may lead to jobs with desirable non-pecuniary characteristics (Franzen and Hangartner 2006; Hall and Mueller 2015).

These related empirical and theoretical inconsistencies are not surprising. Job matching via social networks involves the actions of multiple actors, which may

introduce selection or endogeneity at any of a number of steps in the process (Rubineau and Fernandez 2015). Several related empirical issues have limited our ability to determine how social ties provide value including use of "start with hire" studies (see Fernandez and Weinberg 1997; Fernandez and Greenberg 2013), and an inability to account for unobserved heterogeneity including various skills, characteristics, and propensities (Manski 1993, 1995; Marin 2012, 2013; Mouw 2003; Smith 2005, 2010). From this perspective, the primary search channel employed to find a job may be associated with the quality of the applicant, which is the key driver of labor market outcomes that may also impact reservation wages and negotiating position (Montgomery 1992; Seidel et al. 2000). However, past studies using different methods have questioned the validity of this evidence (see the within-person inter or intra-temporal studies by Mouw [2003, 2006]; Obukhova and Lan [2013]; and Yakubovich [2005]). Of particular concern is the difficulty of observing the attributes of competing offers in non-selected data.

Absent information on the attributes of job offers, the particular mechanisms by which social networks lead to offer acceptance are obscured (Fernandez et al. 2000). For example, a worker may regard total compensation as a very important aspect of a job. She might also value working with her good friend who referred her. Presuming the latter – but not observing the attributes of the offer – may provide a biased estimate of the value of networks, especially if the friend's compensation is correlated with the offered compensation. Second, and arguably more important, without information on the attributes of the choice set of offers, models cannot provide insights into the relative desirability of the offers generated by different job search channels. Consequently, the *value* provided by networks that is observable to the researcher is limited to employment in itself. To the extent that accepting an offer may reduce the likelihood of a search for better employment options this may lead to less-than-desirable employment across an array of dimensions. Further, because networks tend to be homophilous (Greenberg and Mollick 2014; McPherson, Smith-Lovin, and Cook 2001) this may also lead to a suboptimal search that reproduces labor market disadvantages (e.g., Roos and Reskin 1984). Without information on the characteristics of job offers, it is difficult to address arguments that those with "better" social ties may be advantaged in other respects as well (Montgomery 1992; Mouw 2003), or that those with weak-tie offers have a different reservation wage or ability to activate social connections (Marin 2012, 2013; Smith 2005, 2010).

In this research we revisit the "attributes of offers" approach to help clarify network content and thus its basis of advantage. We do so in two steps. First, we model directly the pecuniary (total compensation) characteristics of job offers derived via 10 different search channels, including social relationships that capture weak, bridging ties and strong ties in addition to formal search channels. To address the inferential challenges endemic to the attributes of offers approach, we exploit unique, rich data on two cohorts of students attending an elite MBA program that includes the choice set of job offers from which individuals select their jobs.

Of particular value is the fact that many of the students in our sample have multiple offers with varying characteristics we can measure. These include the industry in which each offer is made, the job function, and the primary non-pecuniary reason (e.g., location, corporate culture, growth opportunities) that students selected or

rejected each offer. In the second step, we use the pecuniary attributes of offers, search channels, and non-pecuniary information in a conditional fixed effects model to predict which offer is selected from the choice set of offers and why (see, e.g., Stern 2004).

The within-individual total compensation models quantify in (U.S.) dollar terms the value of different job search channels embodied in offers made to the *same* job seeker holding constant her reservation wage, human and physical capital, negotiating aptitude, preferences, and other characteristics that do not vary across offers. The data and model also allow the two primary determinants of compensation—industry and function—to vary across offers. As others have argued, identifying such quantifiable returns is key to moving the idea of social capital in general, and social networks in particular, out of the metaphorical and into the practical realm (Burt 1992; Fernandez, Castilla, and Moore 2000).

Our results indicate that job offers received by students through family, friends, or other strong ties offer initial total compensation 17 percent *less* than job offers derived via on-campus recruiting. In this context, this equates to a total compensation discount of tens of thousands of dollars, and an even greater deficit relative to total compensation offered by a previous employer. For offers derived via referrals from weak ties, the corresponding discount is 16 percent. These results in and of themselves suggest that social networks—whether ties are strong or weak—result in employment offers that initially offer significantly less total compensation than offers derived by the same job seeker via formal recruiting channels.

Interestingly, however, when we model actual job *choice* as a function of total compensation, industry, function, and search channels, we find the impact of weak ties is strongly positive in conditional fixed effects models. Consistent with a net-present value model of job choice (Phillips 2001), analyses including the non-pecuniary considerations suggest this is at least partially a result of these ties leading to offers students perceive as having particularly desirable growth prospects. Hence, this finding suggests that a key benefit of social networks is in providing deeper information about the growth opportunities associated with a specific job-firm combination that is otherwise difficult to discern (e.g., Rees 1966) and additional non-pecuniary benefits.

Predictions Assessed: Do Networks Afford Advantages? How and Why?

The strength of weak ties thesis emphasizes the informational advantages provided by networks (Granovetter 1973; see also Yakubovich 2005). In particular, it stresses the probability of accessing non-redundant information about employment opportunities. The logic of this argument is that weak ties—especially bridging ties (Granovetter 1983)—help access different and unfamiliar areas of social structure and thus tap into non-redundant pools of information.

A second view of networks in labor markets is referred to as the "social resources" approach (e.g., Lin, Ensel, and Vaughn 1981). This model presupposes instrumental action, and argues that job seekers with advantaged social resources, including

networks, will obtain superior labor market outcomes (Bridges and Villemez 1986; Lin 1982; Marsden and Hurlbert 1988). Weak ties are presumed better suited to facilitate this access and, therefore, have an indirect impact on labor market outcomes (Lin 1999). The implication of this argument is that offers derived via weak ties are "better" offers with respect to pay or status.

We argue here that the social resources model's simplifying assumptions about what is regarded as a superior job may partially obscure the basis of value provided by networks in important institutional settings. The model of search through social networks we propose is as follows. As an institution, business schools do an effective job drawing prospective employers in a limited number of industries (i.e., financial services and consulting) to formally recruit on campus. Indeed, more than 45 percent of the offers in the school we study were made in these two industries. As a point of reference, Harvard Business School's 2013 placement report indicates that 49 percent of its class accepted offers in consulting (22 percent) and financial services (27 percent).[1]

Hence, general knowledge about these industries and large employers within them is widely available concerning pecuniary characteristics including typical base salaries and bonus. What is harder to gain insights about is the likely growth trajectory produced in a specific job for a typical candidate from a particular school. This information, in turn, is critical for calculating the net-present-value for competing offers, which is important to understand the comparative long term value of different offers (Phillips 2001). Because the social contacts these individuals had prior to matriculation are likely to have similar contacts as a result of triadic closure and other network selection processes (Granovetter 1973; McPherson, Smith-Lovin and Cook 2001), instrumental job seekers are likely to require access to distinct sources of information. In our setting, alumni and current faculty of the school the students did not know prior to matriculation are comparatively well suited to provide this information by drawing on personal or vicarious experience. This discussion implies that the social resources thesis of Lin and colleagues, but not necessarily Granovetter's formulation of the strength of weak ties, leads us to predict as a baseline that:

Hypothesis 1: Job offers derived via social ties should offer higher total compensation than offers originating from other channels.

According to the "better" offer argument, offers derived through network ties should afford higher total compensation than other offers made to that same student through formal channels such as on-campus recruiting. However, if networks do not result in access to jobs with more favorable initial pecuniary characteristics, but instead add value by providing otherwise hard to discern information, there is no *prima facie* basis for offering a directional prediction for compensation at the time of hire. If, on the other hand, the value produced by social ties is primarily in providing information that is important to assess offers and make decisions, we should expect to see students more likely to accept network-derived offers. This may include information about the growth potential of a particular job-firm match. In turn, this leads us to expect that net of pecuniary considerations and other observable factors:

Hypothesis 2: Job seekers are more likely to accept offers derived via weak ties than formal search channels.

The Research Setting: An MBA Labor Market

The Master of Business Administration (MBA) is now the second most popular advanced degree in the United States trailing only education, and far outpacing degrees granted in law and medicine (The Economist 2013; see also Stolzenberg 1994). Students often choose to pursue MBAs for career opportunities and advancement, to increase their earnings prospects, and to develop business knowledge and skills (Bidwell, Won, Barbulescu, and Mollick 2015; Schoenfeld 2012). To achieve these ends MBAs expect their degree granting programs to provide access to desirable employers and career opportunities. Business schools thus have significant operations devoted to career counseling and placement. They also organize various recruiting events (e.g., corporate presentations, career fairs) as well as on-campus interviews for their students.

Students also expect significant social networking opportunities that can facilitate contemporary and future job searching, as well as business and social opportunities more generally. Business schools are well aware of this expectation. NYU-Stern, for example, advertises on an alumni webpage that its "100,000 person alumni, including 500 CEOs, open doors for you in virtually any industry anywhere in the world."[2] The University of Chicago Booth School of Business also underscores "lasting friendships" and "mentors and business contacts for life" as part of its student experience.[3] Stanford GSB touts that at Stanford students will "build a powerful network of accomplished, inspiring colleagues that will continue to sustain you, long after your final class."[4] Harvard Business School, arguably the most famous of business schools, lists what it refers to as its "six differentiators." Two of the six invoke the value of social relationships. The first differentiator relates to its residential learning community in which students can "find a community of support and a close-knit network of friendships that last a lifetime." The second relates to alumni relationships that enable students to "build connections and uncover business opportunities."[5] These schools are not unique in emphasizing the entrée they provide to valuable social networks. To some extent nearly every business school does likewise.

The data for this study are derived from one elite school of business administration. To preserve anonymity we do not mention it by name. However, we note that students from this school typically earn median salaries well in excess of median starting salaries for MBAs in general. Placement rates (measured three and six months after graduation) also far outpace general medians, as do placement rates at the most elite employers across a range of industries. Many alumni of the school have occupied positions of power, influence, and status in private enterprise, government, and NGOs throughout the world. For these reasons, we make no claims about the generalizability of the findings reported below in terms of the U.S. population at large or of the general population of MBA students. As noted above, the value of the research design and data employed here flows from the insights they offer concerning the value of social networks in a setting where total

compensation, discount factors, and non-pecuniary employment dimensions are often analytically evaluated as a function of formal and informal training, and where the purported value of social networks is a foundational assumption.

Data and Methods

The data pertain to two cohorts of students graduating in 2009 and 2010.[6] Across the two cohorts, 709 students responded to our survey—a response rate of 90 percent. Of these respondents, 143 (20.2 percent) did not seek employment and are thus not in our database by definition. The primary reasons a student opted out of recruiting were because her MBA was company sponsored (55.2 percent) or he was starting his own business (35.0 percent). Of the 566 students who sought a job, 91.7 percent received at least one offer as of the August following graduation. After missing data, we have 740 distinct job offers to analyze. In fixed effects models requiring at least two offers per student and within unit variation, the analytical sample includes approximately 497 student-offers made to 219 students (with the analytical sample size varying slightly based on model specification).

In Table S1 in the online supplement we compare students who did and did not seek employment and those who received one or two or more offers based on their human capital (e.g., major, degree granting university, GPA), prior work experience (e.g., years of experience), and internship information. Very few meaningful statistical differences are evident. In the fixed effects analyses presented below these coefficients are not identifiable because they do not vary within person. When we specified models exploiting both within and between student variation that includes data from 564 students with one or more offers, including demographic and human capital controls that vary *across* individuals, the results were consistent with those in the fixed effects model (albeit even more pronounced statistically and substantively).

Outcome measures. Total compensation reflects the current value of the sum total financial compensation offered each student in each job offer she received. Thus, the unit of analysis is the job offer. This figure includes, as applicable: base salary, signing bonus, relocation assistance, tuition reimbursement, stock options (estimated at current market value), and the value of other guaranteed compensation. We employ this measure rather than simply base salary (or base salary and signing bonus) because our analyses and discussions with MBAs indicate that these additional dimensions of an offer have a significant bearing on job offer evaluation and decision making. Indeed, in conditional fixed effects models with no controls predicting which offer students accepted from a choice set of offers equal to or greater than two, the model of total compensation had considerably better model fit ($\chi^{2(1)}$=20.13, $p < .0001$; Pseudo R^2=.10) than the natural log of base salary alone ($\chi^{2(1)}$=4.91, $p < .05$; Pseudo R^2=.03). For robustness, we also specified models employing the log of base salary as the outcome that yields similar conclusions (available upon request).

The second outcome measure is within individual, the offer she selects from amongst her options where the option set, S, ranges from 1 to 4. This set is top

Table 1: Summary Statistics of Variables Used in Conditional Fixed Effects Models

Variable	Mean	SD Overall	SD Within	Min	Max
Ln(Total compensation)	11.833	0.336	0.204	10.463	13.162
Offer selected	0.446	0.498	0.456	0	1
Primary search channel:					
Weak ties	0.094	0.292	0.196	0	1
Strong ties	0.088	0.283	0.158	0	1
Contacted directly	0.069	0.254	0.155	0	1
Job postings	0.056	0.231	0.132	0	1
School sponsored events	0.054	0.227	0.145	0	1
Resume database/Other	0.015	0.12	0.071	0	1
Newspaper, magazine, internet board	0.025	0.157	0.093	0	1
Previous employer	0.042	0.2	0.153	0	1
Summer internship	0.157	0.364	0.287	0	1
On campus recruiting	0.4	0.2	0.093	0	1
Reason for accepting/rejecting an offer:					
Commitment to sustainability	0.04	0.196	0.159	0	1
Compensation	0.084	0.277	0.203	0	1
Growth potential	0.205	0.404	0.269	0	1
Industry	0.103	0.304	0.206	0	1
Job content	0.117	0.322	0.225	0	1
Job function	0.159	0.366	0.266	0	1
Location	0.121	0.327	0.226	0	1
Other	0.075	0.264	0.2	0	1
People/Corporate culture	0.056	0.231	0.161	0	1
Prestige of firm	0.04	0.196	0.133	0	1

coded. However, only 0.7 percent of students had more than four offers rendering the effects of top coding negligible.

Business schools' career services define explicit policies concerning the period of the school year in which interviews can be conducted, the provision and timing of offers, and the minimum length of time companies must allow students to consider offers extended to students (typically around 3 months). For these reasons, the choice set we study represents a relatively compressed time period (three months) thereby approximating the circumstances of contemporaneous employment choice.

Predictors. Students were presented with a list and description of eleven search channels, and were asked to note the *primary* one used to identify and ultimately secure each offer of employment received (see Table 1).[7] We consider alumni and faculty whom they first met at school as weak bridging ties that were made possible by enrolling in the school. (Students were asked whether they knew the alumni or faculty prior to enrolling in school and in nearly every case the answer was they did not.) The two were then combined into a measure of "weak ties" (mean=0.094,

s.d.=0.292). We consider friends, family, or non-school ties the student knew prior to enrollment as strong ties (mean=0.088, s.d.=0.283).[8]

For each offer, students were asked the primary reason they accepted or rejected it (see Figure 2). These reasons can vary across offers for each student. Options included: growth potential, location, people/corporate culture, prestige of firm, job content, job function, commitment to sustainability, compensation, industry, or other factors. Figure 1 provides simple unconditional estimates, the most frequently cited reason for accepting or rejecting an offer was perceived growth potential (20.5 percent), followed by job function (15.9 percent), and location (12.1 percent). The primary reason cited for accepting a job was also growth potential (34.7 percent). Finally, for each offer we also collected information about the primary industry in which the firm operates, as well as the function for which the offer was made.

Total compensation (TC) model of employment offers

The model we specify predicts the total (logged) financial compensation of each *offer* the student received. The outcome measure reflects the total present value of all financial compensation offered to a student for her first year of employment. To interpret predictors we subtract one minus an exponentiated unit increase in a predictor multiplied by 100, which translates to a percentage change of a specific number of U.S. dollars in total compensation.[9] Search channels (e.g., weak ties, strong ties) are the key predictors. The omitted baseline is on-campus recruiting.

$$Ln(Total\ compensation)_{ij} = \beta_0 + \sum_{p=1}^{P} \beta_1(\boldsymbol{Search\ channel})_{ij} + \beta_2\boldsymbol{\Theta}_{ij} + \beta_3\boldsymbol{\omega}_{ij} + \varepsilon_{ij} \quad (1)$$

As noted, this is a (within-student) fixed effects model. Hence, all student-specific factors that do not vary across offers are not identifiable (such as race or gender). Information that varies across offers includes the industry ($\boldsymbol{\Theta}$) in which each specific offer is made, as well as the specific job function ($\boldsymbol{\omega}$)—two factors that predict a high degree of variance in compensation (see, e.g., Petersen, Saporta, and Seidel 2000). For ease of presentation we do not report coefficients for industry and function below.

A within-individual (conditional fixed effects) model of choice

To model which offer j student i selects from her choice set $S\{1,..,4\}$ we specify a conditional fixed effects logistic models of the general form:

$$Pr(Choice)_{ij} = \beta_0 + \sum_{p=1}^{P} \beta_1(\boldsymbol{Search\ channel})_{ij} + \beta_2(Ln(TC))_{ij} + \beta_3(\boldsymbol{Reason})_{ij} + \beta_4\boldsymbol{\Theta}_{ij} + \beta_5\boldsymbol{\omega}_{ij} + \varepsilon_{ij} \quad (2)$$

Here $Ln(TC)$ represents the natural log of total compensation in job offer i for student j. Reason is a vector that specifies for each offer i for student j, why she accepted or rejected the offer, including: growth potential, location, people/corporate culture, prestige of firm, job content, job function, commitment to sustainability, compensation, industry, or other factors. As was the case above, to ease presentation we do not display the coefficient estimates for each function or industry.

Offers are not independent of student (intra-class correlation$^{(1)}$=0.343, R^2=0.631, $p < .0001$). We therefore calculate robust standard errors clustered by student. As a robustness check, we also specified models that cluster within-employer based on the idea that compensation packages are likely fairly standardized within employer as well (intra-class correlation$^{(1)}$=0.269, R^2=0.489, $p < .0001$). Yet another model estimates two-way clustered standard errors around student and employer. One can imagine other bases of clustering including industry, but these do not exhibit substantial intra-class correlations and, moreover, have no material impact on results. These results are all available upon request but omitted here to conserve space.

Findings: Total compensation (TC) model of employment offers

Figure 1 presents a graphical depiction of the unconditional, weighted average (within and between students) of total compensation offered through each job search channel. The unit of analysis is the job offer. Error bars representing standard errors are also displayed. The search channel yielding the highest average total compensation is one's previous employer followed by on-campus recruiting and summer internships. By comparison, the two categories of search channels that entail social connections yield offers that are amongst the lowest. These measures all differ statistically from the baseline category in unconditional comparisons.

Figure 2 provides frequencies and a comparison of job search channels depending on whether or not the offer was accepted. The unit of analysis is the job offer conditioned on students having more than one offer. We highlight two key points: First, offers derived via school sponsored events are more likely to be rejected than accepted. Conversely, 62 percent of offers derived via a weak tie are accepted. Evidently, the accepted offers derived primarily through this search channel offer some specific non-pecuniary characteristics that offset a significant total compensation discount at the time of hire noted above. We will return to this point below when we discuss the job choice models.[10]

The figure and tables above reveal descriptive differences in the types of search channels employed and the total compensation they yield. However, these bivariate results do not account for confounding factors and do not fully make use of the within-person data available here. In Table 2 we present various regression models. As noted above, the outcome measure represents the natural log of total compensation offered each student i in each job offer j. To build intuition, the first model is an OLS regression. We calculate standard errors that account for multi-dimensional clustering by job seekers and employers (Cameron, Gelbach, and

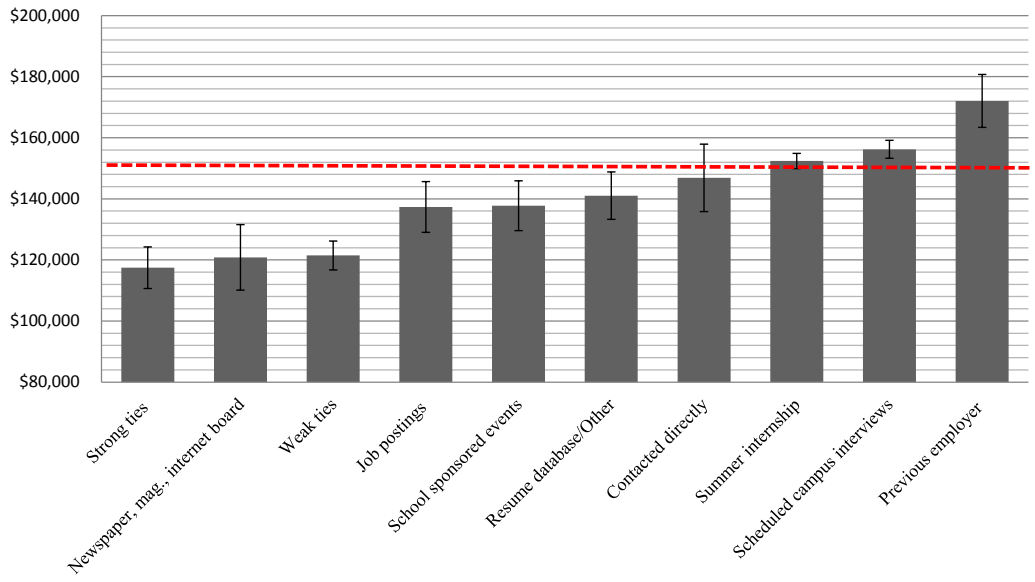

Figure 1: Mean Total Compensation (TC) Per Offer by Search Channel

Note: Source: Proprietary data from a perennial top US business school. Vertical bars indicate the unadjusted mean total compensation (as applicable in US dollars: base salary, signing bonus, relocation aid, tuition reimbursement, current estimated value of stock options, and other guaranteed compensation) offered students by various job search channels. Dashed horizontal line represents the overall sample average. The unit of analysis is the job offer within and between students (N=740). Error bars represent standard error.

Miller 2011; Kleinbaum, Stuart, and Tushman 2013). To account for the observable characteristics of students that may influence the total compensation employers offer them and the search channel they use, we make use of the rich set of demographic and human capital controls collected. These include: gender, international citizen, undergraduate GPA, graduate GPA, GMAT verbal and quantitative scores, Ivy League undergraduate degree, undergraduate major, age, years of work experience, prior industry of employment, and year of graduation. These models also control for industry and function.[11] The coefficient for weak ties is -22 percent ($(e^{b(-.248)} - 1) * 100$, $p < .001$, two-tailed test) relative to on-campus recruiting (the baseline here and henceforth). For strong ties it is -21 percent ($(e^{b(-.238)} - 1) * 100$, $p < .01$, two-tailed test). These estimates suggests that network-derived offers pay considerably less, controlling for a host of observable characteristics, industry, and function.

However, unobservable factors may be driving these results such that comparatively weaker candidates use networks rather than formal search. To address this issue, we exploit the fact that many of the job seekers in our setting receive multiple offers with varying characteristics, including the search channel employed. Models two and three are within job seeker fixed effects models. In these models, each coefficient can be interpreted as the percentage increase or decrease in total compensation associated with the use of a different job search channel *by the same student* in their contemporaneous job search.

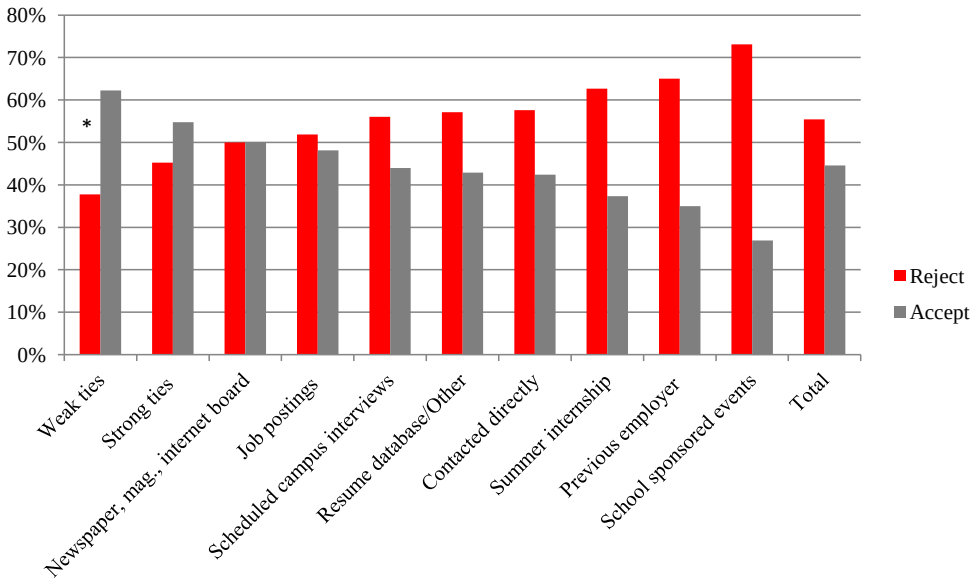

Figure 2: Offer Acceptance/Rejection Rates By Search Channel.

Note: Source: Proprietary data from a perennial top US business school. Vertical bars indicate the primary search channel cited for deriving offers that were accepted (grey) or rejected (red). The unit of analysis is the job offer for students with more than one offer (N=478). Bars by choice assessed using LR-$\chi^{2(1)}$. $* = p < .05$ (two-tailed).

We present model 2 as a baseline with only the search channels to build intuition. As noted by the mostly negative coefficients, on-campus interviews tend to yield offers with higher total compensation than other search channels, as revealed in Figure 2. Offers derived through strong ties are, on average, 20 percent ($(e^{b(-.217)} - 1) * 100$, $p < .001$, two-tailed test) less than those derived via on-campus recruiting. For job offers derived through a weak tie the corresponding estimate is -13 percent ($(e^{b(-.143)} - 1) * 100$, $p < .05$, two-tailed test). Contrary to Hypothesis 1, these results suggest a substantively important negative return to social networks versus formal search at the point of hire. At least in this setting, social networks do not lead to better-paying offers in terms of initial total compensation.[12]

This model does not, however, account for the industry (e.g., consulting, banking) and function associated with each job, which likely have a bearing on total compensation (Petersen, Saporta, and Seidel 2000). The third model thus varies function and industry by offer. Inclusion of these alternative-varying coefficients significantly improves model fit (BIC drops from -158.215 to -63.308), and an omnibus F-tests support their inclusion in the model as follows: F(10,217)=1.83, $p < .1$ for function; F(14,217)=1.79, $p < .05$ for industry; and F(24,217)=1.93, $p < .01$ for both. However, the inclusion of these measures does not materially change conclusions. The estimate for weak ties is now -16 percent ($(e^{b(-.173)} - 1) * 100$, $p < .05$, two-tailed test) while that for strong ties is -17.0 percent ($(e^{b(-.192)} - 1) * 100$, $p < .05$, two-tailed test). It should be noted that in all models, getting an offer from a prior employer (who did not sponsor the student's education) results in an offer with total compensation that exceeds those obtained through social contacts ($\chi^{2(1)} = 8.69$,

Table 2: Regression Coefficients Predicting Ln(Total compensation)

	(1) OLS	(2) FE	(3) FE
Weak ties	−0.248†	−0.143*	−0.173*
	(0.059)	(0.064)	(0.075)
Strong ties	−0.238†	−0.217†	−0.192*
	(0.068)	(0.052)	(0.077)
Contacted directly	−0.049	−0.186*	−0.245*
	(0.087)	(0.082)	(0.103)
Job posting	−0.145	−0.121	−0.186
	(0.094)	(0.100)	(0.110)
School sponsored event	−0.154	−0.103	−0.106
	(0.089)	(0.078)	(0.086)
Resume database/Other	−0.04	0.08	0.095
	(0.109)	(0.093)	(0.130)
Newspaper; magazine; internet	−0.245*	−0.239	−0.308
	(0.114)	(0.205)	(0.216)
Previous employer	0.124	0.111	0.13
	(0.065)	(0.076)	(0.075)
Summer internship	−0.01	−0.066	−0.051
	(0.038)	(0.042)	(0.053)
Constant	11.549†	11.903†	11.938†
	(0.377)	(0.024)	(0.046)
Job seeker FE	No	Yes	Yes
Industry FE	Yes	No	Yes
Function FE	Yes	No	Yes
Controls	Yes	No	No
N(clusters)	564	497(219)	476 (218)
F(df)	7.66 (52)†	3.12 (9)†	2.68 (33)†
R^2(within for FE)	0.28	0.068	0.19

Note: Source: Proprietary data from a perennial top US business school. Model 1 clusters standard errors around job seeker and employer. It also includes the following controls: Gender, international citizen, undergraduate GPA, graduate GPA, GMAT verbal/quant. score, Ivy league undergraduate degree, undergraduate major, age, years of work experience, prior industry of employment, and year of graduation. Models 2 and 3 are job seeker fixed effects models.
† = $p < .01$, ∗ = $p < .05$(two-tailed).

$p < .01$ for weak ties v. previous employer; $\chi^{2(1)} = 9.31$, $p < .01$ for strong ties v. previous employer).[13]

The models above demonstrate that social ties—especially strong ties such as family and friends—do not lead to job offers with higher total compensation compared to offers obtained through previous employers who likely have significant knowledge of the candidate, or those obtained through on-campus recruiting. How-

Table 3: Regression Coefficients Predicting Job Choice

	(4) Logit	(5) FE	(6) FE	(7) FE
Ln(Total comp.)	1.992†	2.306†	2.903†	3.360†
	(0.692)	(0.514)	(0.585)	(0.824)
Weak ties	1.248*		1.464†	1.537*
	(0.552)		(0.534)	(0.631)
Strong ties	0.178		0.838	0.631
	(0.441)		(0.633)	(0.718)
Contacted directly	0.434		0.002	−0.117
	(0.508)		(0.661)	(0.734)
Job posting	0.381		1.325	1.217
	(0.734)		(0.759)	(0.940)
School event	−0.444		−1.640*	−1.863*
	(0.591)		(0.791)	(0.807)
Resume database/Other	0.826		−0.792	−2.445
	(1.099)		(1.091)	(1.498)
Newspaper, magazine, internet	0.989		−0.348	0.172
	(0.785)		(0.741)	(0.818)
Previous employer	0.879		−1.309*	−1.108*
	(0.721)		(0.542)	(0.560)
Summer internship	1.093*		−0.444	−0.297
	(0.435)		(0.332)	(0.363)
Job seeker FE	No	Yes	Yes	Yes
Industry FE	Yes	No	No	Yes
Function FE	Yes	No	No	Yes
Controls	Yes	No	No	No
N	564	424	424	424
Wald-χ^2(df)	187.36 (54)†	20.13 (1)†	39.57 (10)†	71.98 (33)†
Log likelihood	−286.584	−134.418	−121.315	−110.379
Pseudo R^2	0.225	0.103	0.191	0.264

Note: Source: Proprietary data from a perennial top US business school. Model 4 clusters standard errors around job seeker and employer. Models 5 - 7 are conditional fixed effects models.
† = $p < .01$, ∗ = $p < .05$ (two-tailed).

ever, those analyses do not reveal the determinants of job choice as an outcome. In Table 3 we present various choice models that predict which job offer is chosen by a student with more than one offer. As above, we begin with a model within- and between-student offer that includes the controls discussed above, and which employs multi-way clustered standard errors around job seeker and employer. The model reveals the odds of offer acceptance increase by 21 percent per 10 percent increase in total compensation ($(e^{b(1.992*ln(1.1))} - 1) * 100$, $p < .01$, two-tailed test). The model also reveals that offers derived via a weak tie are more likely to result

in an accepted offer ($3.48 = (e^{b(1.248)})$, $p < .05$, two-tailed test). As above, however, this model cannot fully account for the possibility that search channels are correlated with job seeker characteristics that drive choice.

Model 5 is a conditional fixed effects regression (within job seeker) including only the logged total compensation measure to establish a baseline. The coefficient estimate is highly significant ($p < .001$, two-tailed test), and suggests that a ten percent increase in total compensation results in a 24.6 percent increase in the odds of accepting an offer ($((e^{b(2.306*ln(1.1))} - 1) * 100$, $p < .01$, two-tailed test). Evidently, money matters to MBA students. Model 6 is a conditional fixed effects specification that includes the search channels students with multiple offers employed to derive offers. The coefficient for weak ties is both substantively and significantly large, with a multiplier of 4.32 ($(e^{b(1.464)})$, $p < .01$, two-tailed test). The coefficient for strong ties is not significant.

To ensure that this effect is not a function of structural factors relating to different industries (e.g., some industries may be more likely to favor network-based recruiting), model 7 includes, for each offer, a measure of the industry in which the offer was made as well as the function. Results are consistent with those in prior models. Additionally, the weak ties coefficient is statistically differentiable from that for previous employers (and summer internships, $\chi^{2(1)} = 8.48$, $p < .001$) as well. Taken together, these results suggest that, controlling for the total compensation offered, students are more likely to accept offers derived primarily through weak ties rather than on-campus recruiting. Money, evidently, is not everything.

As part of this research, job seekers were asked the primary reason they accepted or rejected each offer. Figure 3 depicts these reasons within and between students with multiple offers. As is evident, the primary reason cited for accepting an offer was perceived growth potential. What is potentially interesting about these results is their asymmetry. For example, commitment to sustainability was cited as a reason for rejecting offers. However, none of our respondents cited it as the primary reason for accepting an offer. We note here that weak ties are the primary search channel cited as resulting in offers with perceived growth potential.

Table S3 in the supplement presents additional analyses. In Model 8 in Table S3, we include nine reasons cited as the primary basis for accepting or rejecting an offer. The omitted baseline is growth potential, the most frequently cited reason. Because of limited variation, we constrain the coefficient for "commitment to sustainability" to one. This model, with mostly negative (and substantively large) coefficients relative to growth potential, shows that most of the other factors are considerably less likely to lead to offer acceptance. In Model 9 in Table S3 we once again constrain the coefficient for "commitment to sustainability" to one and estimate the coefficient for growth potential relative to all other reasons (b=2.725, $p < .001$, two-tailed test). With its inclusion, the effect for weak ties is attenuated a bit, suggestive of partial mediation. These results are consistent with hypothesis 2, which argued that the value of weak ties is information access that overcomes asymmetries and facilitates better matching. Because of the relatively limited number of observations and large number of covariates, we took steps to assess robustness. Model 10 in Table S3, for example, drops all the industry and function measures. In doing so, the effect for growth potential is reduced but still very large (b=2.047, $p < .001$,

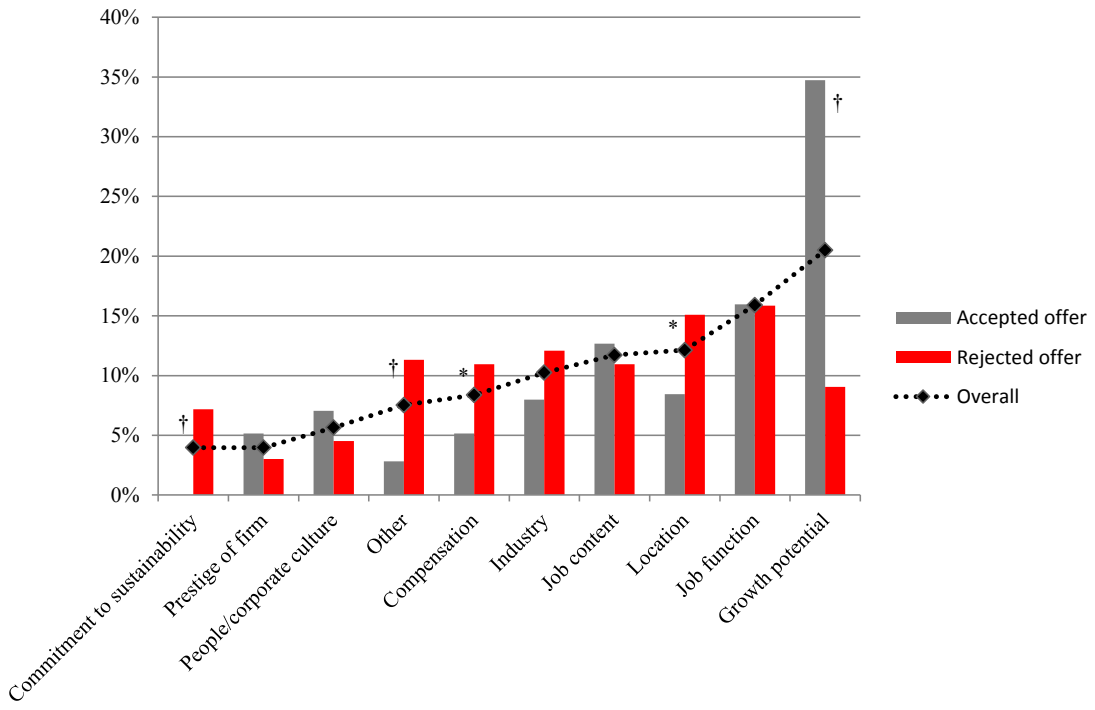

Figure 3: Percent of Respondents Citing Each Reason for Accepting/Rejecting an Offer

Note: Source: Proprietary data from a perennial top US business school. Vertical bars indicate the primary reason a student cited for accepting (grey) or rejecting (red) a specific job offer. Diamonds denote the combination of the two data points. The unit of analysis is the job offer within and between students with more than one offer (N=478). Bars compared using t-tests assuming unequal/equal variance yield similar results. $* = p < .05$, $** = p < .01$ (two-tailed).

two-tailed test), qualitatively illustrating its importance. Indeed, considered in terms of total compensation equivalents, this coefficient implies that relative to an offer with high perceived growth potential, total compensation at the point of hire would have to increase roughly 89 percent for an offer without perceived desirable growth potential to induce acceptance. This estimate is large, but consistent with a net-present value assessment (Phillips 2001). This is particularly true given compensation packages and growth trajectories in this study population (Bidwell, Won, Barbulescu, and Mollick 2015), as well as when viewed in light of prior studies' estimates of the equivalents for geographic distance (Davies et al. 2001; Dahl and Sorenson 2010).

Summary and Conclusion

There is great and growing interest in the value of social capital, particularly that produced by social networks (e.g., Portes 1998). However, a host of theoretical and methodological issues have limited our ability to determine whether, to what extent, and why social networks have an impact on labor market outcomes. In

this research, we propose a test that provides a sounder basis for answering this question. Our findings indicate that the relative desirability of job offers should be considered as entailing pecuniary and non-pecuniary dimensions. Moreover, this distinction has a bearing on which search channel is likely to lead to an offer deemed more desirable on different dimensions.

Offers received by students through social ties—whether strong or weak—offer total compensation tens of thousands of dollars less than job offers derived from prior employers or on-campus recruiting. These effects hold in within-person fixed effects models. These models offer a rigorous test of the total compensation offered the *same* student via different job search channels in contemporaneous searches, while also allowing variation in the characteristics of each alternative including industry and function. In analogous models that exploit both within and between student variation that allow for the inclusion of a host of demographic and measures of human capital (e.g., prior work experience, standardized test scores, undergraduate and graduate GPA) we find similar results. These results would seem to suggest that social networks may have a negative return when initially accepting employment.

In examining when students are willing to forgo total compensation to accept an offer derived through a network tie, we found that jobs accessed through social ties such as through faculty and student referrals are in firms in industries that are difficult to gain access to via on-campus recruiting. Given the setting, it is beyond doubt that these latter features of jobs are actively investigated and considered by graduating MBAs regardless of which search channel produced the job offer. It is therefore interesting to find that social ties *do* matter on this margin. Although further research is needed here, this finding suggests the following interpretation: Social ties are not serving to guide people to employment options with particular pecuniary characteristics – the characteristics of these options are clearly observable. Rather, the value of social networks is in helping overcome information asymmetries concerning the nature of specific work opportunities that are difficult to observe, and providing access to industries that are difficult to access via formal recruiting channels. This finding is consistent with Granovetter's (1973) view of weak bridging ties as affording non-redundant information and/or access to different regions of the social structure.

On a practical level, there is substantial debate in academia and the popular press concerning the value of an MBA and business schools more generally. This research demonstrates how and to what extent business schools provide value to their students in terms of their first jobs out of school. Our findings suggest that an elite business school education is associated with a significant increase in total compensation. For those students for which we have pre-MBA annual base salary figures, the overall average is $72,874 (s.d.=$29,185). The post-MBA salary and especially total compensation for this same set of students is significantly greater. Moreover, job offers received through on-campus recruiting are generally higher in terms of total compensation than those received through students' strong social ties, which presumably could have been activated without attending business school. Thus, the value afforded by business schools is twofold: First, they enable comparatively efficient on-campus recruiting services that generate employment

offers with desirable total compensation in specific industries (e.g., financial services, consulting). Here, the business school is providing value by serving as a gatekeeper to those industries. Second, they provide students with connections to bridging weak ties—faculty and students—that provide students employment opportunities along with soft opportunity-specific information that helps overcome information asymmetries. At least in this setting, a key *value* of social ties lies in their ability to grant access to disparate areas of social structures which are otherwise difficult to access via formal search or stronger ties. This point is consistently emphasized by business schools when they tout the social networks these schools foster and maintain for their alumni long after they graduate. Whether similar patterns are evident in other labor market settings or at different stages of one's career are important questions worthy of future study. The analytical setup employed in this research provides a guide for interrogating how and why social networks produce value.

Notes

1 http://www.hbs.edu/recruiting/mba/printready/data-and-statistics.html (retrieved on December 16, 2013).

2 http://www.stern.nyu.edu/experience-stern/network/index.htm (retrieved on December 16, 2013).

3 http://www.chicagobooth.edu/programs/full-time/student-experience (retrieved on December 16, 2013).

4 http://www.gsb.stanford.edu/stanford-gsb-experience/why-business-school (retrieved on December16, 2013).

5 http://www.hbs.edu/mba/the-hbs-difference/Pages/default.aspx (retrieved on December16, 2013).

6 Labor markets varied during these two years. That said, we did not observe significant statistical variation in the models specified across cohorts with respect to our core questions.

7 In theory, multiple channels could be used. In our context, this was not ascertainable. However, we do not believe it has a bearing on our core finding. This follows because across students, virtually no offers in industries that do not recruit on-campus were attributable to channels other than via weak ties.

8 The key point of the strength of weak ties theory is that weak ties have a higher probability of bridging social structures (Granovetter 1983). As noted, our survey included a direct question inquiring whether the student knew the person before enrolling in school, as well as a separate question characterizing the nature of the tie. As a result, we can infer comparative bridging capacity because strangers are more likely to act as bridges (Aldrich and Kim 2007).

9 This estimate is calculated as $(e^b - 1) * 100$. For small values of β_i, $e_{\beta i} \approx 1 + \beta_i$. This implies that a quick *approximate* interpretation of small values of β_i can be derived by calculating $100 * \beta_i$.

10 In preliminary analyses we compared which job search channels women and men use in this context. There is no evidence of systematic differences. The same holds when we

contrasted students by year of matriculation in an attempt to measure variations that can be attributed to labor market demand.

11 To conserve space we do not report these controls, but they are available upon request. We note here, however, that they are consistent with prior research as female candidates earn less, on average (b=.-0.071, s.e.=.037, $p < .1$, two tailed) than male students for example.

12 In a model treating Ln(base salary) as the outcome rather than total compensation, the coefficient estimate for weak ties is -0.09 (s.e.=.032, $p < .01$, two tailed). For strong ties it is -.096 (s.e.=.042, $p < .05$, two tailed).

13 Analyses of Winsorized outcomes (at 1 percent) are consistent with those presented, suggesting that outliers are not driving results (available upon request).

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