THE ORIGIN OF DIFFERENCES IN IMMIGRANTS' STRATEGIC CHOICES: JOB SEEKERS & ENTREPRENEURIAL FIRMS

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THE ORIGIN OF DIFFERENCES IN IMMIGRANTS' STRATEGIC CHOICES: JOB SEEKERS & ENTREPRENEURIAL FIRMS

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This dissertation examines the origin of differences in job search strategies among high skilled immigrant workers and business strategies among ethnic entrepreneurial firms. I explore this general question in two separate studies. One focuses on how variation in immigrant scientist and engineering graduates' embeddedness within different academic programs, which differ in terms of demographic composition (e.g., national origin), affect their identification with contemporaries as well as predecessors and therefore, their job search strategies vis-à-vis natives. A second considers how variation in founders' embeddedness in their respective ethnic communities within a national origin group is related to differences in shared notions of resource acquisition, which shape early strategic choices as well as subsequent evolution of professional service ventures.

This research aims to contribute to work on organizational theory, economic sociology of job search and ethnic entrepreneurship. First, it serves to add to current understandings of social embeddedness and self-categorization processes within the understudied contexts of higher education organizations and ethnic entrepreneurial firms. It assesses the applicability of prior theories in lesser-known populations and extends current theories by developing a richer understanding of how compositional

categories (e.g., national origin, ethnicity) can serve as salient bases of social identification to particular groups within the relevant context.

A related contribution is to inform scientific and technical work literature. At a time when the attraction and retention of immigrant scientists and engineers are increasingly seen as an engine of economic growth and a driver of firm competitive advantage, the project may enhance greater understanding of diversity in high-skilled U.S. workers' job strategies and career patterns.

Second, this research offers new empirical insights that link individual choices, social relationships and social systems together by studying the labor market entry of new science and technology graduates and early strategic choices of ethnic ventures. Thus it reconnects organizational theory to the study of work, entrepreneurship and individual decision making.

Finally, by tracing and analyzing the evolution of ethnic ventures, the study identifies more fully how social ties that are forged, renewed and extended through actors within the ethnic community may affect early strategic choices of new ventures. It also highlights the conditions under which initial strategies of young firms may not impede subsequent diversification initiatives, but rather make it possible to switch to a new regime of practices. Taken as a whole, my research contributes to work on organizational theory, career studies and entrepreneurship.

BIOGRAPHICAL SKETCH

Mallika Banerjee initially developed her research interests as part of growing up in India where she had an opportunity to witness the emergence of a high-technology service economy in the 1990s and migration of large number of Indian IT professionals abroad. After finishing high school in India on National Merit scholarship, she came to England to study for a bachelor's degree in Sociology from the University of Exeter followed by an MPhil from the University of Cambridge. As part of her student life in Britain, she directly encountered the aspirations, dreams and career strategies of immigrant students – many of whom were scientists and engineers. Later when she took up consultancy jobs in London with Andersen (accounting) and subsequently with Credit Suisse First Boston Group, she came in direct contact with other immigrant workers and entrepreneurs. Their unique but varied life stories motivated her to explore the social processes that shape employment and entrepreneurship among high-skilled immigrants.

To Ella

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CHAPTER 1

INTRODUCTION TO THE PROJECT

The purpose of this dissertation is to examine the origin of differences in job search strategies among high skilled immigrant workers and business strategies among ethnic entrepreneurial firms. Drawing on social 'embeddedness' (Granovetter, 1985; Uzzi, 1996) and social identity theories (Tajfel & Turner, 1986; Turner, 1987), I address how individuals' embeddedness in different social structures or communities, corresponding closely to their national origin and ethnic identities, create differential access to material resources among and within national origin groups with important consequences for their careers and ventures. Specifically, I explore this general question in two separate studies. One focuses on how variation in immigrant scientist and engineering graduates' embeddedness within different academic programs, which differ in terms of demographic composition (e.g., national origin), affect their identification with contemporaries as well as predecessors and therefore, their job search strategies vis-à-vis natives. A second considers how variation in founders' embeddedness in their respective ethnic communities within a national origin group is related to differences in shared notions of resource acquisition, which shape early strategic choices as well as subsequent evolution of professional service ventures.

Four unanswered questions at the interface of organization theory, sociology of work and ethnic entrepreneurship motivate this project. First, literature on career

outcomes of (young) high-skilled workers has focused primarily on initial job search strategies (Granovetter, 1974; 1995; Obukhova & Lan, 2013) and job placement (Oyer, 2006; 2008; von Wachter and Bender 2006) of these workers. Unfortunately, this focus on individual job seekers as the source of difference has subsumed any inquiry into how higher education organizations serve as the site of self as well as social categorization processes for graduates from different national origin groups and influence job search methods of skilled immigrant graduates vis-à-vis natives in the host country.

Second, science and technical work literature in the field of organization theory (e.g., Barley & Kunda, 2001; 2004) does not directly address nation-based diversity within the confines of its research. In fact, this body of scholarship rarely acknowledges difference among high-skilled workers. Because science and technical work in the U.S. has been increasingly reliant on a large number of high-skilled immigrant workers (National Science Board, 2010), research must begin to examine this relevant population at work.

Third, although the literature on migration and ethnic entrepreneurship explores the connections between co-ethnic networks, resource endowments and career outcomes (including small business ownership) of different national origin groups in the host society (see Light, 2005; Aldrich & Waldinger, 1990 for reviews), much of this scholarship has been focused on low-skilled migrants or ethnic entrepreneurs in low-skilled industries. Thus, its applicability to skilled immigrant workers and high-skilled ethnic firms is unclear.

Fourth, when the links between variation in resource endowments among

national origin groups and small business ownership have been investigated in ethnic entrepreneurship literature, the difference being examined is most often *between-group* differences. Thus, almost no studies have examined variation in resource endowments on entrepreneurial activities at a subgroup level within a national origin group. Because ethnic groups from a particular nation might diverge in their pattern of entrepreneurial activities in the host country due to differences in their social identities and historical experiences (e.g., Frederking, 2002; 2004), research must identify and theorize more fully the interplay among founders' embeddedness in ethnic communities, their corresponding social identities and access to resources and evolution of new ventures. Below I describe the structure of the dissertation in more detail.

Structure of the Dissertation

In my dissertation, I used a mixed-methods design to evaluate hypotheses and develop propositions. The dissertation is organized into two main empirical chapters. The chapters provide distinct insights on different aspects of the two phenomena - job search strategies of recently-arrived, high-skilled immigrants and early strategic choices as well as adaptation of immigrant-owned professional service firms. In the final chapter, I bring the findings from these two chapters together, reflect on what I learned as well as discuss my contributions to the literatures and offer guidance for future research on high-skilled immigrants. The outline of the two empirical chapters is set out below.

Chapter two investigates the role of higher education organizations in young

professionals' job search processes and early career outcomes. More specifically, it examines how the demographic composition of academic departments influences the use and effectiveness of first-time job search methods (e.g., informal friendship networks and faculty contact) of immigrant scientist and engineering graduates vis-à-vis natives. For this study I used the new cohort cases of the 2001 Survey of Doctorate Recipients, who earned their first S&E doctoral degrees between July1, 1998 and June 30, 2000, supplemented by the Survey of Earned Doctorates 1981-2000, the 1995 National Research Council reports and other public use data sources.

My analyses suggest that immigrant graduates were less likely to use informal friends for job search compared to natives unless they graduated from programs with a higher presence of co-national alumni. Interestingly, contrary to my expectation, I find that informal contacts were equally effective for immigrants and natives in resulting job offers. This could be due to the fact that for immigrant graduates access to informal friends for job search was the biggest issue given their limited presence in academic programs. Those who could have access to friends, however, seemed to benefit as much as natives from those connections.

A related finding is that immigrants were more dependent on faculty connections for job search relative to natives, indicating higher dependence of the former on academic organizations to navigate the job search process. As expected, however, in the presence of co-national alumni in academic programs, immigrant graduates relied less on faculty for their job search. Findings from my exploratory analyses also suggest that if graduates were able to mobilize faculty support for their job search, they benefitted equally from those connections, irrespective of their

immigrant status or national origin. Furthermore, the effectiveness of faculty was independent of the presence of co-national alumni on the program. Overall, this chapter provides a greater understanding of the relationship among academic programs, immigrant status and initial job placements of science and engineering graduates.

In chapter three, I turn attention to the micro-level mechanisms that support macro-level variation in initial business and human resource strategies in entrepreneurial firms, using an inductive study of thirteen Indian immigrant-owned IT service firms in the U.S. Although sharing a common national homeland and identity, these entrepreneurs were characterized by a high level of regionally and linguistically-based ethnic diversity. Findings suggest that differences in founders' embeddedness in different ethnic communities (Telugu vs. Non-Telugu), corresponding closely to their ethno-linguistic identities, shaped two different strategic choices of new ventures – the pursuit of body-shop versus client-shop strategies respectively. I demonstrated how non-Telugus distinguished their pursuit from Telugu-owned body-shops, while Telugus maintained and renewed practices of body-shopping business through three mechanisms: (i) narratives to distinguish spheres of business activity, (ii) ethnic cultural associations to insulate and preserve body-shopping business pursuits, and (iii) social ties to Andra Pradesh, India, to access resources on an on-going basis to renew and expand body-shopping endeavor.

My analysis complements the growing body of research that highlights founders' background in our understanding of the evolution of new ventures. According to extant accounts, founders draw on prior knowledge, skills, culturally

appropriate templates and their mental models in crafting initial strategies and employment relations (Ding, 2011; Beckman & Burton, 2008; Boeker & Wiltbank, 2005). By contrast, my results suggest that differences in founders' embeddedness in different social structures, corresponding closely to their ethnic identities, and shared notions of resource acquisition tactics (or lack thereof) can affect early strategic choices of new ventures.

To further explore the evolution of young ventures in an industry setting, chapter two also examines the adaptation processes of immigrant-founded professional service firms in the face of changing market and regulatory environments. My findings suggest that under certain conditions initial business and human resource strategies of young firms might not impede subsequent diversification initiatives. Specifically, my analysis indicates that debates on regulatory reforms in the broader society could shift the conversation about 'appropriate' business and employment practices at the local level and affect the behavior of individual founders' to implement strategic change in organizations. A core theoretical contribution of my study is to identify more fully the drivers, especially the triggering events and critical junctures, which make an organization path dependent and the conditions under which path breaking or switching to a new regime of routines and practices are more likely to occur. It thus contributes to research on organizational path dependence (Sydow, Schreyogg, and Koch, 2009).

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CHAPTER 2

ACADEMIC ORGANIZATIONS & FIRST CAREER-PATH JOB PLACEMENTS OF SCIENTISTS AND ENGINEERS

Introduction and Research Questions

This study examines the role of higher education organizations in scientist and engineering graduates' job search processes and early career outcomes. For instance, how do scientist and engineering graduates' with few or no work-related connections obtain jobs? How does the demographic composition of academic departments influence the use and effectiveness of job search methods of immigrant scientists and engineers vis-à-vis natives? Drawing on social 'embeddedness' (Granovetter, 1985; Uzzi, 1996) and social identity theories (Tajfel & Turner, 1986; Turner, 1987), I propose that variation in young immigrant scientists and engineers' embeddedness within different academic programs, which differ in terms of national origin composition, affect their identification with contemporaries as well as predecessors and therefore, their job search strategies vis-à-vis natives. For this study I use the new cohort cases of the 2001 Survey of Doctorate Recipients (SDR), who earned their doctoral degrees between July1, 1998 and June 30, 2000, supplemented by the Survey of Earned Doctorates (SED) 1981-2000 and other public use data sources.

The impetus for this research arises from the growing importance of immigrant scientists and engineers to the Science and Engineering (S&E) workforce in the US as well as the increasing presence of immigrant doctoral students in Science, Technology, Engineering and Mathematics (STEM) programs at American academic

institutions. Across a representative sample of college graduates in 2003, 25% of all college-educated workers in S&E occupations were foreign-born[1], as were 40% of doctorate holders in S&E occupations. Further, about half of all foreign-born scientists and engineers were from Asia, and more than a third of U.S.-resident doctorate holders originated from China (22%) and India (14%) (National Science Board, 2010).

Consistent with these figures, the U.S. Department of Education (2009) reports that foreign students received 61% of all doctorates conferred in Engineering, 60% in computer and information sciences and 44% in physical sciences in 2008 (refer to Tables 288, 289, 291, 292), with students of Chinese and Indian origin together contributing to half of the total S&E doctorate pool. Furthermore, among 2004-07 S&E doctorate recipients, more than 90% of these graduates from China and 89% of those from India reported their intention to pursue their career in the U.S., and 59% and 62%, respectively, reported accepting firm offers of employment or postdoctoral research in the U.S. The 5-year stay rate for 2002 foreign doctorate recipients was 62% in 2007, down from 65% for the class of 2000 but still remained at a record high level (National Science Board, 2010). Accordingly, a greater understanding of the relationship among academic programs, immigration status and job search methods will shed light on the 'missing' link between organizations and initial job placements of immigrant science and engineering graduates.

Nonetheless, despite a burgeoning literature on the effect of job search

[1] Although the category 'foreign-born' masks the great diversity within this group, Kannankutty & Burrelli (2007) using the 2003 data estimated that 77% or more than three-fourths of immigrant scientists and engineers came to the U.S. when they were at least 18 or older.

methods on job seekers' labor-market outcomes (Granovetter, 1995; Lin, 1999; Mouw, 2003; 2006) and the impact of initial job placement on young workers' subsequent career outcomes (Kahn 2010; Oyer, 2006; 2008; von Wachter and Bender 2006), we still have very limited understanding of how the demographic composition of academic programs may affect job search strategies of different national origin groups. My focus on academic programs is particularly important in this context because the majority of young graduates have few or no work-related connections on which to draw (Obukhova & Lan, 2013; Hanser, 2002), and are largely dependent on organizational resources to navigate the job search process and launch their early career. For immigrant students, who increasingly stay in the country to work after the completion of their studies, academic organizations may be especially significant in facilitating their job search processes in the host country.

Drawing on social 'embeddedness' (Granovetter, 1985; Uzzi, 1996) and social identity theories (Tajfel & Turner, 1986; Turner, 1987), I propose that demographic dissimilarity such as national origin affects graduates' identification with their contemporaries as well as predecessors within academic programs and therefore, their job search strategies and subsequent career outcomes. The explanation is that individuals compare their demographic characteristics with those of other members of their work group, and the degree of perceived dissimilarity with their colleagues affects people's self-categorization as members of their group. Such positive self-assessment and in-group identification subsequently affects group relationships including in-group favoritism and out-group bias.

Specifically, I examine the influence of *co-national alumni* on two key

variables: the extent to which young university graduates *used* informal methods of job search (e.g., faculty, friends) and whether some of these methods were differentially *effective* than others for natives and immigrants in terms of job placements. My research extends prior research on relational demography by documenting the influence of co-national alumni on differential job search strategies of natives and immigrants. I also contribute to social networks literature of job search by shedding light on organizational level mechanisms that produce differential career outcomes for new labor force entrants.

Influence of Co-national Alumni on the Use and Effectiveness of Job Search Methods

I use the phase *co-national alumni* throughout to represent the prevalence of native or immigrant[2] graduate students in a program from the respondent's country of origin who graduated after the respondent entered the program but before the respondent's year of graduation. Co-national alumni score for an immigrant student increases as the number of co-national in his or her program increases. While the effect of co-national alumni on natives and immigrants have not been addressed in relational demography literature, scholars have long recognized the relationship between demographic dissimilarity (e.g., gender, ethnicity) and work group outcomes such as commitment and turnover intentions (Tsui, Egan, & O'Reilly, 1992); creativity and productivity (Chatman, Polzer, Barsade, & Neale, 1998); as well as task

[2] For this study natives and immigrants are classified by their immigration status. Therefore, students with a permanent residence or citizenship status at the date of the completion of their PhDs are treated as natives, whereas students on a temporary visa (e.g., student or visitor or temporary worker) are classified as immigrants.

and emotional conflict (Chattopadhyay, George, & Shulman, 2008). Drawing on social identity and self-categorization theories (Tajfel & Turner, 1986; Turner, 1987), one explanation advanced for such results is that individuals tend to categorize themselves and others based on gender or ethnicity to separate similar others from dissimilar others (e.g., Chattopadhyay, Tluchowska, & George, 2004; Tsui et al., 1992). The argument is that individuals seek to maintain a positive social identity by placing themselves and dissimilar others into in-groups and out-groups using criteria salient in their work context, and comparing their own in-group favorably relative to the out-group. Consistent with this reasoning, I present arguments outlining how co-national alumni influences the social identity of natives and immigrants and affects their job search strategies.

First, immigrant scientists and engineers may feel excluded from social circles in academic programs. They may have little opportunity to have informal interaction with their co-nationals in graduate programs due to a limited presence of students from the same country of origin. In these circumstances they may benefit from cross-cultural friendships with native-born to access key institutional resources and opportunities such as information about research and funding opportunities. But a number of studies report that immigrant students, especially those from Asia, Africa and South America, encounter difficulties in establishing relationships with host nationals (Trice, 2004; Borg, Maunder, Jiang, Walsh, Fry, & Napoli, 2009). Typically immigrant students from non-Western countries identify language and cultural differences as barriers to establishing social relationships with American peers (Wierzbicka, 1997; Perrucci & Hu, 1995). Even where immigrant students have

"meaningful relationships" with American peers, these friendship ties are often instrumental and they rely on co-nationals for much needed emotional support (Gibson & Ogbu, 1991; Stanton-Salazar, 1997). This finding is consistent with research on peer relations which have found that cross-ethnic and cross-cultural relationships tend to be weaker than same-ethnic and intra-cultural ties (Ibarra, 1995; Mollica, Gray & Trevino, 2003). This is because homophilous relationships, ones characterized by commonalities along language, culture, and ethnicity, strengthen interpersonal bonds and provide individuals with greater social support from friends/co-workers than do heterophilous relationships (Kossinets & Watts, 2009; for a review see McPherson et al, 2001). For immigrant S&E students, low availability of co-nationals in academic programs and limited informal interaction with American peers may exclude them from important information, advice and support networks. Hence I propose the following:

Hypothesis 1: An immigrant S&E graduate is less likely to use informal friends for job search compared to a native S&E graduate.

While a focal immigrant graduate is less likely to use informal contacts for job search, research has consistently demonstrated that job search through informal friends is a more effective tool than other methods. In his seminal work on professional, technical and managerial workers in Boston, Granovetter (1974; 1995) reported that job information obtained through personal contacts (e.g., family and friends) was of higher quality and more effective in terms of generating job offers than that available by formal means such as public and private employment agencies and direct applications. This is because contacts may help the job seeker to better understand the

screening and hiring process or match the job seeker with a vacancy that is a good fit for her skills and aspirations. Further, contacts may provide the employer with trustworthy information and vouch for the job seeker's quality or even induce the employer to hire the job seeker (for reviews, see Lin 1999; Marsden & Gorman, 2001; Mouw, 2003).

Consistent with this reasoning but extending it further, recent research demonstrated that young job seekers, including young professionals, were disadvantaged because they had few useful contacts and were, therefore, considerably more likely than other job seekers to use formal means and direct application (Hanser, 2002). Thus while young university graduates used (i) market (e.g., direct contact with company, internet), (ii) school (e.g., career office, school job fair), and (iii) contacts (e.g., family, friends and faculty), the majority of first-time job seekers relied more on market (33%) and school (61%) and less on contacts (6%) for their job searches (Obukhova, 2012). However, young graduates benefitted most from job searches through contacts relative to formal methods and schools. Thus, Obukhova & Lan (2013) reported that job opportunities identified through applicants' personal networks were more likely to result in an interview, an offer, and an acceptance than opportunities identified through formal methods and even through university career offices. Although these studies have not investigated job search strategies utilized by skilled *immigrant* graduates in the early stages of their career in the host country, it is possible to argue that most immigrant job-seekers may be more disadvantaged than native-born in terms of activating and mobilizing personal contacts for their job searches.

As discussed previously, because of their non-overlapping social circles with native-born in academic programs and limited access to co-national alumni, immigrant graduates may have few useful contacts which they can effectively mobilize for job hunting. Although native-born students are unlikely to have a lot of useful contacts early in their career, they are more likely to have broader social relationships which they can utilize for job searches. Accordingly, informal friendship networks for job search may be less effective for immigrants relative to natives. Therefore, I hypothesize:

Hypothesis 2: Job searches through informal friends are likely to be less effective for an immigrant S&E graduate relative to a native S&E graduate.

Given that immigrant students have few or no work-related informal friendship contacts on which they can draw, they may be more dependent on faculty relative to natives to navigate the job search process. Theoretically, however, research suggests two contrasting views regarding the likelihood of an immigrant student using faculty connections for job search and the effectiveness of this method. One view suggests that demographic dissimilarity and perceived cultural distance with native advisors may decrease immigrant students' identification with the advisor. Studies have reported that many immigrant students experience a sense of confusion, anxiety and isolation due to a lack of clarity regarding the style and norms of the supervisor-supervisee relationship along with self-directed scholarship expected of them in their graduate programs (Goode, 2007; Goode & Murphy, 2007; Borg et al., 2009). For instance, immigrant students preferred more structure, support and guidance, particularly in the first year of study, from their advisors in helping them to make the

transition. Many immigrant students also expected a close relationship and frequent contact with their supervisors and were surprised and hurt if supervision took place in a more functional or professional manner with little attention to students' personal development and needs. Also, the dominant practices of infrequent and brief supervisor-student meetings and establishing appointments and exchanging ideas via email were quite alien to immigrant students. From the faculty perspective, ethnic, nationality, and cultural differences are often reported to be an obstacle for native mentors in identifying positively with their foreign students. Thus, Trice (2003) found that newly enrolled immigrant S&E students had difficulty finding an advisor who would take them into his/her research group, even when funding was available. This is consistent with extant research which proposes that demographic similarity affects supervisor's personal attraction to and identification with subordinates (Tsui & O'Reilly, 1989; for a review see Williams & O'Reilly, 1998). Overall this line of reasoning suggests that immigrant students are less likely to use faculty for job search and this method may not be as effective as natives.

An alternative view is predicated on the assumption that the concentration of immigrant S&E students in academic programs is likely to be associated with a higher proportion of co-national faculty members. This would be due to the semi-autonomous structure of most S&E departments in which individual faculty members have a significant say in recruiting graduate students. Some preliminary evidence suggests that S&E research labs directed by foreign-born faculty were more likely to be populated by students from the same or similar country of origin than were labs directed by native faculty (Tanyildiz, 2008). A few qualitative studies also report that

faculty members from immigrant students' country of origin often played a key role in giving academic direction and guidance to these students as well as supporting them to identify and engage with opportunities for professional development such as presenting at a seminar or in obtaining employment (Borg et al., 2009). If immigrant S&E students are more likely to cluster in academic programs with a higher proportion of co-national faculty members and positive and developmental relationships with these faculty members provide them with access to jobs, then we can expect immigrant students to use faculty more for their job searches and this method is likely to be at least as effective as natives.

The demographic profile of U.S. university settings (where this study was undertaken) shows that a higher percentage of Asians (24%) is employed as computer science, mathematics, or engineering faculty and that about 91% of them are non-U.S. born, most of them being naturalized citizens (Burrelli, 2011). Consistent with the demographic profile of faculty in STEM fields, a significant number of immigrant graduates from Asia are also clustered in computer & mathematical sciences as well as engineering (refer to Table 2.1). Under such conditions and lacking limited or no access to co-ethnics, immigrants may be more dependent on faculty for their job search relative to natives and, when utilized, these faculty connections may be as effective as natives to result in job offers. In other words, it is reasonable to assume that there is unlikely to be any significant differences between immigrant and native graduates in the effectiveness of faculty for job search. I will explore this possibility directly in the analyses. This leads to the following:

Hypothesis 3: An immigrant S&E graduate is more likely to use faculty for job

search compared to a native S&E graduate.

While immigrants are more likely to use faculty and less likely to use informal friends for their job search relative to natives, I propose that the prevalence of co-national alumni in academic programs may differentially impact the use of informal friends and faculty for an immigrant graduate. Generally speaking, higher prevalence of co-national alumni in academic programs is likely to provide immigrant graduates with greater access to co-ethnics, leading them to utilize informal friends for job search more. More specifically, physical proximity to co-national alumni is likely to promote contact and frequent interactions between the focal immigrant student and co-ethnics. Such opportunities to consult group members informally, frequently and face-to-face (e.g., through shared office space or a shared coffee room) may provide an informational base and support mechanisms. Thus immigrant students attending programs with a higher number of co-national alumni may receive more help and have greater opportunities to help each other compared to compatriots who are in programs with few co-nationals.

Furthermore, given that job opportunities identified through personal networks are more likely to result in a job offer (Obukhova & Lan, 2013; Granovetter, 1995), the greater use of co-national alumni by immigrants may make job searches through informal friends at least as effective as natives. For instance, through personal contact and interactions with co-ethnics, immigrant students graduating from programs with a greater prevalence of co-national alumni are more likely to connect with high-status alumni. These alumni may connect immigrant students with other established community members who can give inside information about job openings, vouch for

their competence and suitability of the job, and even negotiate advantageous employment contracts on their behalf. This argument is consistent with research on low-skilled immigrant groups which has found that concentration, not dispersion, is beneficial for network-dense ethnic communities, and ethnic job search strategies emerge from the adaptation that individual immigrants make to the resources available to them (Waldinger, 1996; Portes, 1998; Portes & Sensenbrenner, 1993).

A corollary of this argument is that a greater prevalence of co-national alumni in a program will lead immigrant graduates to rely less on faculty compared to natives. Hence I propose the following:

Hypothesis 4: The positive relationship between immigrant status and use of faculty connections for job search is moderated by co-national alumni, such that the prevalence of co-national alumni in an academic department will decrease the use of faculty to a greater extent for an immigrant graduate than for a native-born.

While immigrants are less likely to use faculty and more likely to rely on informal friends relative to natives in the presence of co-national alumni, it is difficult to presuppose any relationship among the effectiveness of faculty, immigrant status and the prevalence of co-national alumni here. One possibility is that the effectiveness of faculty works independently of that of informal friends for job search in the presence of co-national alumni. Therefore, I do not propose any hypothesis and will directly test the relationship in the analysis.

Methods

Data

To examine these hypotheses, I used the new cohort cases of the 2001 Survey of

Doctorate Recipients (SDR), who earned their first S&E doctoral degrees between July1, 1998 and June 30, 2000[3]. The new cohort frame of the 2001 SDR was an ideal study sample for this research inquiry because a number of supplementary questions pertaining to recent graduates' job search strategies were asked as part of the main survey. Although the supplementary questions were retrospective in nature, the biases were kept to a minimum due to the fact that all respondents graduated less than 1-3 years before the survey reference date and that the National Science Foundation (NSF) survey team took special care to validate the data. For the 2001 SDR, the number of new cohort cases totaled 3,159, with recent skilled immigrants comprising 566 cases. The 2001 SDR contained details on personal attributes (e.g., country of birth, visa status and citizenship at PhD conferral date), educational attainments and future plans (e.g., locations of high school, Baccalaureate/Master's institutions, fields of study, post-graduation plans) as well as job search methods of recent graduates. However, the survey contained almost no information regarding the characteristics of PhD institutions and programs attended by the respondent.

In order to construct variables of interest on educational institutions (e.g., the historical composition of co-national alumni at the department, program size and rank, sources of financial support for doctoral recipients), I matched the 2001 SDR to the 1995 National Research Council (NRC) report and the 1981-2000 Survey of Earned

[3] Using all earned doctorates (except law, medicine, business) from U.S. universities as the target population, the SDR follows a sample of individuals throughout their careers from the year of their degree award through age 75. The survey is conducted every 2 to 3 years and the panel is refreshed in each survey cycle with a sample of new doctoral degree earners. For instance, the sampling frame of the 2001 SDR consisted of all individuals less than 76 years of age who had received a research doctorate in a science, engineering, or health field from a U.S. academic institution, were not institutionalized, and were living in the United States or a U.S. territory during the survey reference week of April 15, 2001 (i.e., April 15-April 21, 2001). For details, see http://nsf.gov/statistics/srvydoctoratework/.

Doctorates (SED). The 1981-2000 SED contained data on all earned doctorates, except professional doctorates (e.g., law, medicine, business), granted by regionally accredited United States universities, in all fields, from 1981 to the present and served as the target population for the 2001 SDR. The SED was sponsored by the NSF, and typically was filled out by the graduates at the time they completed all requirements for the doctoral degree of the graduate schools. For each institution and year in the 1981-2000 SED file I computed the total number of students, who graduated from a specific degree field of study, using year of entry, year of graduation, visa status (e.g., permanent resident/U.S. citizen versus temporary visa holder) and country of citizenship, and linked it to the 2001 SDR file. Thus, for each observation in the matched SDR-SED file, I had a count of co-national alumni who had entered the program prior to the respondent's year of entry and graduated at least one year after the respondent entered the program.

I supplemented the matched SDR-SED sample of new doctoral degree earners (N=3,159) with data on program rankings and program characteristics obtained from the National Research Council's 1995 report (refer to Goldberger, Maher, & Flattau, 1995). The NRC evaluated a total of 274 U.S. institutions that granted doctorates in at least one of the 41 fields of study. It provided ratings of faculty quality and of the effectiveness of the program based on the assessments of other degree-granting universities in that field. More specifically, ratings were pooled and an average rating calculated using a five-point scale ranging from 0 to 5, with 0 representing not sufficient/effective and 5 representing distinguished/extremely effective. The report also provided characteristics of participating programs including the number of PhDs

produced over a 5 year period, the percentage of PhDs awarded to U.S. citizens and permanent residents as well as the primary form of support (e.g., research versus teaching assistantship) to graduates.

Finally in order to rule out the possibility that the use and effectiveness of job search methods of doctoral recipients might be affected by the concentration of co-ethnics in the metropolitan statistical areas (MSA), I merged the geographic location of the respondent's PhD institution to the 2000 Decennial Census that had information on the clustering of co-nationals in MSAs.

I restricted my analyses to 2,758 cases after dropping the 401 cases (12.69% of the original sample) who reported that they did not seek or hold 'career-path' jobs[4]. Table 2.1 presents the descriptive characteristics of the respondents in my sample. As shown, natives were more likely to have majored in the field of social and behavioral sciences (28.55%), followed by engineering (17.78%), whereas immigrants were more likely to have obtained a degree in the field of engineering (29.11%) followed by physical/environmental sciences (18.78%). Furthermore, immigrants were more likely to be male, Asian and have dependent children compared to natives. I also confirmed that my sample of new cohort cases from the 2001 SDR compared fairly well with the SED target population of the survey (refer to Appendix II.1).

-Insert Table 2.1 here-

Measures

Dependent variables. To construct *the use of informal friends* and *faculty* for job

[4] These 401 cases must be dropped because they did not answer job search questions pertinent to the current analysis.

search, I utilized the respondents' reporting of informal friends and faculty (yes/no responses) as two possible methods for seeking their first career path jobs. It is important to note that each respondent reported ten job-search methods for seeking his/her first job after receiving the doctorate: 1) faculty, 2) market recruiters, 3) career office, 4) professional meetings, 5) electronic postings, 6) newspaper, 7) professional journals, 8) informal friends, 9) direct contact with company, and 10) other. Subsequently, the respondent identified the two most important job search methods – 'most important' & 'second most important'[5] resource – responsible for finding his/her first career path job. I used the respondents' answer to the 'most important' resource to construct *the effectiveness of informal friends* and *faculty* as job search strategies.

In order to identify any differences between natives and immigrants in the type of job search methods used, I first tabulated the job search methods used by the two groups (refer to Table 2.2). In general, immigrants were more likely to utilize faculty (as well as electronic postings, market recruiters, career office, direct contacts with company, professional meetings), but less likely to utilize informal friends for their job search than natives.

-Insert Table 2.2 here-

Furthermore, as shown in Table 2.3, immigrants were more likely than natives to utilize four or more job search methods simultaneously (t-test: $p<.001$), perhaps capturing more intensive effort on their part. Indeed, natives were more likely to rely on only one type of job search method relative to immigrants (refer to Table 2.4).

[5] 18% of the sample did not report any second job search method.

Overall 348 people used only one job search method. Among this group, as illustrated in Table 2.4, 89% of the natives versus 11% of the immigrants used only one method to find their first career-path jobs (t-test: $p<.001$).

-Insert Tables 2.3 & 2.4 here-

In order to identify the most common combinations of job search methods used by the survey respondents I also conducted an exploratory factor analysis. Details of this analysis are presented in Appendix II.2.

Next I examined the effectiveness of job search methods reported by the respondents' in finding their first career-path jobs. For this set of analyses, I included only those cases who used at least two methods of job search, with at least one resulting in a job offer and therefore identified by the respondent as the 'most important' strategy. This reduced my sample size to (N=2,758-348) 2,410 cases. Table 2.5 reports descriptive statistics on the sample, using the respondent as the unit of analysis. There does not seem to be any differences between immigrants and natives in the effectiveness of faculty for job search. However, consistent with prior research, job search through informal friends seemed to be a more effective tool than other methods and benefitted natives who used contacts more than immigrants.

-Insert Table 2.5 here-

***Independent variables*.** My key independent variable of interest is immigrant status. I constructed this binary variable by combining two sources of information: a) a question from the 1998-2000 SED file asking respondents to indicate their visa and citizenship status at the time of the receipt of their doctoral degrees, and b) a question from the 2003 SDR, which comprised almost two/thirds of the original 2001 SDR

sample, asking individuals to answer a number of questions regarding their visa status at their point of entry to and during their stay in the U.S. I only utilized the 2003 SDR to recode the missing values (4.31% or 172 cases) on respondents' visa and citizenship status in my sample. If the respondent indicated that s/he was a temporary U.S. resident on student/work/other temporary visa at the time of the receipt of his/her doctoral degree, *immigrant status* was coded "1." For all other respondents who identified themselves as U.S. permanent resident and/or citizen at PhD receipt, this was assigned a value of "0."

Moderating variables. The key moderating variable of interest is *co-national alumni* at the program level. Using the 1981-2000 SED, for each observation in the SDR, I computed a count of students from the respondent's country of origin who graduated one year after the respondent entered the program and/or graduated one year before the respondent's year of graduation. However, due to the multicollinearity between immigrant status and alumni measure of co-nationals, in the final analysis I used a binary measure of co-national alumni grouping immigrants and natives by the alumni presence of the program (e.g., below vs. above median number of conational alumni) they graduated from.

Control variables. In addition, my analyses also contained a large number of control variables that past research (e.g., Bound & Turner, 2010) has shown to affect the use and effectiveness of job search methods. These include attributes of individuals, programs they graduated from and sector where they are currently employed. Individual-level characteristics include *age at PhD completion*, *time-to-degree completion* and *number of job search methods used*, all continuous measures. *Male*

was measured as a dummy variable (0= female). I also used a dummy variable to control for respondents' *marital status* (1=married), as well as a dummy for *dependent children* (1= dependents).

Additionally, I controlled for six attributes of the program that are likely to affect respondents' job search strategies: *field of study*, *program rank*, *public university*, *size of PhD program*, *percentage of PhDs awarded to natives*, and *funding*. *Field of study* was indicated by a series of dummies for computer and mathematical sciences (reference category); biological sciences; physical and environmental sciences; social and behavioural sciences and engineering etc. It is important to note that the wide variation in the classification of fields of study across U.S. federal agencies such as the NSF and NRC created a special challenge to this project. Specifically, there were two main issues. First, for new fields in biological sciences, there was no one-on-one correspondence between SED taxonomy and NRC classification. I assigned these new fields into NRC categories after researching the definition of these fields on the internet. Second, a substantial number of programs in my sample (692 cases or 25.09% of 2,758 observations) did not have any ranking scores because either those degree fields were outside the scope of the NRC ranking (unranked fields of study) or programs in those institutions were excluded from the NRC target population (unranked programs in a field of study). Therefore, I constructed two analysis samples – (i) a 'strict' NRC sample, i.e., cases with NRC ranking scores only (including unranked programs in a field with an assigned score of zero but excluding unranked fields of study) and (ii) 'lax' NRC sample, i.e., cases with NRC ranking scores as well as the imputed scores of unranked fields. Appendix II.3

describes the adjudication procedure used to construct a cross-walk of degree field coding across SED, SDR and NRC in more detail.

I assessed program rank using the 1995 NRC ratings of faculty quality based on a five-point scale ranging from 0 to 5, with 0 representing not sufficient/effective and 5 representing distinguished/extremely effective. In the analyses dummies were used for program ranking – being a tier I, II, III or IV program (with the first serving as the omitted category). I also used a dummy variable, *public university*, to measure whether a program was part of a private (0) versus public university (1) with greater emphasis of applied sciences. To measure *size of PhD program* I used a natural logarithm transformation of the number of PhDs produced over a 5 year period as provided by the 1995 NRC report. *Percentage of PhDs awarded to natives* was indicated by a dummy variable (e.g., below vs. above median percentage of natives that graduated from a program). Likewise, dummies were used to delineate sources of *funding* to graduates – teaching assistantship (omitted category), research assistantship, fellowship, loan/personal/family funds and others. I also included a series of dummies to delineate *sectoral* effects – being part of academia/a research institute, of government, a for-profit industry or a non-profit industry (with the first serving as the omitted category).

Finally to control for location I merged the geographic location of the respondent's PhD institution to the matched SED-SDR sample. However, due to the multicollinearity between immigrant status and location, I could not run the models with the location variable. In order to rule out the possibility that universities with higher concentrations of immigrants might also be in cities that were more accepting

of hiring immigrants, I tabulated the locations and names of top ten doctorate granting institutions where four major national origin groups of immigrant students - Chinese, Indian, Korean and Taiwanese, were likely to be concentrated. The tabulation was done after merging my analysis sample with the 2000 Decennial Census that had information on the clustering of co-nationals in MSAs. As shown in Tables 2.6a-2.6d, the locations of top ten universities where the immigrant students from China, India, Korea and Taiwan were clustered did not necessarily overlap with the top ten MSAs where their co-ethnics were located.

-Insert Tables 2.6a-2.6d here-

Analyses

I used logistic regression models to analyze the data. In the first set of models, I estimated how the use of informal friends and faculty for job search differed by respondents' immigrant status, after controlling for individual attributes, characteristics of academic programs, and degree fields for the full sample. In the second set of models, I restricted my analysis to those who used at least two job search methods (e.g., either informal friends or faculty and another method) for finding their first jobs and examined whether there were systematic differences on the effectiveness of informal friends and faculty depending on respondents' immigrant status. Finally, for both sets of analysis the interaction between co-national alumni and immigrant status indicated whether the use of faculty and informal friends for job search were less prevalent and less effective in the presence of higher number of co-national alumni in a focal immigrant's academic program.

I tested the models using both 'strict' NRC and 'lax' NRC samples to account

for the fact that I imputed scores of unranked fields of study for the latter sample (refer to the section on control variables and Appendix II.3). The pattern of results for lax NRC samples was the same as that for strict NRC data and the conclusions were broadly similar. I only present results using strict NRC samples below (please contact the author for results using lax NRC data). I ran unweighted analyses throughout to take account of the fact that geography of doctoral institution was not part of the SDR sampling design.

Results

Tables 2.7 and 2.8 present summary statistics for the variables. Table 2.7 shows the means and standard deviations and Table 2.8 shows zero-order correlations. All variance-inflation factors in the multi-level analysis were less than 4.5, indicating no severe violations of multicollinearity.

-Insert Tables 2.7-2.8 here-

In Tables 2.9 and 2.10, I examine the impact of immigrant status on the use and effectiveness of informal friends for job search, since my hypotheses suggested this as the key predictor variable. In each table, Model 1 provides the baseline model, while Models 2-3 include immigrant status and co-national alumni respectively. The fourth model includes all variables.

-Insert Tables 2.9 & 2.10 here-

In Table 2.9 which shows models predicting the use of informal friends, I find strong negative effects for the immigrant status across Models 2-3 ($p<.01$), in line with arguments developed in Hypothesis 1. Furthermore, although not hypothesized, the coefficient of immigrant status becomes marginally significant in Model 4 ($p<.10$),

suggesting that in the presence of co-national alumni immigrants are as likely to use informal friends as natives. Thus, I find strong support for Hypothesis 1. In general, scientists and engineering graduates from larger academic programs with research assistantship/ fellowship/ external support and currently working for government or (for-profit) industry are more likely to rely on informal friends for job search compared to those from smaller programs supported by teaching assistantship and working in academia. Also, the use of informal friends seems to be a more common strategy among graduates who use multiple job search methods simultaneously. Using lax NRC data I find similar but stronger results. In sum, hypothesis 1 is supported suggesting that although immigrants are less likely to use informal friends for job search than natives, in the presence of co-nationals they are equally likely to rely on informal friends for job search.

In Table 2.10, presenting analyses of the effectiveness of informal friends for job search, the coefficient of immigrant status is negative across models 2-4, but does not attain significance. Thus, I find no support for Hypothesis 2, indicating that job searches through informal contacts are equally effective for immigrants and natives. Surprisingly, the coefficient of conational alumni is negative across models 3 and 4, suggesting that the presence of conational alumni in programs makes job searches through informal friends less effective for both natives and immigrants! In general, informal friends seem to be more effective for graduates who stayed on their programs longer and currently working for the non-profit industry. Also, informal friends as a method of job search seem to be less effective when utilized in conjunction with other methods. Results from lax NRC data are fairly consistent with this pattern. Therefore,

Hypothesis 2 is not supported.

Tables 2.11 and 2.12 report analyses predicting the use and effectiveness of faculty for job search respectively. Specifically, these models allow me to examine the impact of immigrant status as well as the interaction between immigrant status and co-national alumni (*immigrant x co-national alumni*) on faculty usage, as proposed in Hypotheses 3 and 4 respectively. Turning first to Table 2.11, I find that the coefficient of immigrant status in Model 4 has a significant positive impact on the use of faculty for job search ($p<.05$), providing support for Hypothesis 3 and indicating that immigrants rely more on faculty for their job search compared to natives. Furthermore, the coefficient for the interaction term between immigrant status and co-national alumni in Model 4 is negative and significant ($p<.05$), signifying that immigrants rely less on faculty for their job search in the presence of co-national alumni. This lends support to Hypothesis 4.

Generally speaking, older science and engineering graduates use faculty less for their job search compared to their younger counterparts. Furthermore, graduates from physical and environmental sciences and those currently working for non-profit industry utilize faculty less compared to their counterparts in computer and mathematical sciences and working in academia. Also, graduates supported by research assistantships seem to use faculty for their job search more than those supported by teaching assistantships. The use of faculty is also a more common strategy among graduates who use multiple job search methods simultaneously. Using lax NRC data I find similar results. Therefore, Hypotheses 3 and 4 are supported.

-Insert Tables 2.11 & 2.12 here-

In Table 2.12, presenting exploratory analyses of the impact of my predictors on the effectiveness of faculty, the coefficient of immigrant status is positive across models 2-4, but does not attain significance. The result is in line with arguments corroborating that when utilized by immigrants, faculty connections may be as effective as natives. Likewise, I find no evidence of an interaction between immigrant status and co-national alumni in Model 4. Thus, I find no support that in the presence of co-national alumni the effectiveness of faculty as a job search tool diminishes for immigrant graduates.

All else equal, faculty connections are more effective for male, as opposed to female, graduates and those supported by research assistantship/ fellowship/ other sources relative to those funded by teaching assistantships. However, faculty connections are less effective if graduates received their doctorates from a public (vs. private) university, the academic program awarded a higher proportion of degrees to natives, they stayed on the program for longer and utilized faculty in conjunction with other job search methods. Results of lax NRC data are broadly consistent with these patterns. In sum, my exploratory analyses suggest that job searches through faculty may be equally effective for immigrants and natives, and the presence of co-national alumni has no impact on the effectiveness of faculty as a job search method for immigrants.

Discussion and Conclusion

Despite voluminous research indicating that initial job search strategies and job placement have significant effects on the subsequent career outcomes of young scientists and engineers, three central questions remain unanswered: (a) what kind of

job search methods do science and engineering graduates with few or no work-related connections use to obtain jobs?, b) how does the demographic composition of academic organizations and programs influence the use and effectiveness of job search methods across different national origin groups? and (c) what organizational level mechanisms produce those differences? As the importance of immigrant scientists and engineers to the Science and Engineering workforce in the US continues to grow (National Science Board, 2010), the comparison across different national origin groups may yield important insights into the role of universities and academic programs in high-skilled workers' job search and early job placement processes.

This study examined how the use and effectiveness of job search strategies, especially informal friendship networks and faculty contact, are shaped by scientist and engineering graduates' immigrant status and co-location with their compatriots in academic programs. Building on recent studies of relational demography (e.g., Chattopadhyay, George, & Shulman, 2008) and job search processes of young professionals (Obukhova & Lan's, 2013), I find that demographic dissimilarity along national origin affects young job-seekers identification with their contemporaries as well as predecessors within academic programs and therefore, their job search strategies and subsequent career outcomes. Specifically, immigrant graduates were less likely to use informal friends for job search compared to natives unless they graduated from programs with a higher presence of co-national alumni. Interestingly, contrary to my expectation, I find that informal contacts were equally effective for immigrants and natives in resulting job offers. This could be due to the fact that for immigrant graduates access to informal friends for job search was the biggest issue

given their limited presence in academic programs. Those who could have access to friends, however, seemed to benefit as much as natives from those connections.

A related finding is that immigrants were more dependent on faculty connections for job search relative to natives, indicating higher dependence of the former on academic organizations to navigate the job search process. As expected, however, in the presence of co-national alumni in academic programs, immigrant graduates relied less on faculty for their job search. Findings from my exploratory analyses also suggest that if graduates were able to mobilize faculty support for their job search, they benefitted equally from those connections, irrespective of their immigrant status or national origin. Furthermore, the effectiveness of faculty was independent of the presence of co-national alumni on the program.

While previous studies have provided some evidence of the link between demographic dissimilarity (e.g., gender, race) and work group outcomes, almost all prior work has relied on samples of one or two organizations, and few have linked demographic dissimilarity to more tangible early career outcomes of skilled workers. A few recent studies that examined early career outcomes of graduates have rarely investigated whether and the extent to which job search methods employed by skilled *immigrant* workers in the initial stages of their career in the host country are different from comparable natives. My analysis, based on a representative sample of national survey data from doctorate recipients in U.S., allows me to control for a variety of individual, organizational, and program characteristics that might affect graduates' job search strategies and thus provides more systematic examination of the way in which immigrant status and differences in national origin within academic organizations

affect the use and effectiveness of job search methods.

The overall pattern of my results suggest that we can develop a richer and more accurate understanding of the influence of demographic composition in co-located work groups by paying attention to the degree to which compositional categories serve as salient bases of social identification to particular groups within the relevant organizational context. My research extends prior research on relational demography documenting the influence of co-national alumni on differential job search strategies of natives and immigrants. I also contribute to sociological literature on job search by shedding light on organizational level mechanisms that produce differential career outcomes for new labor force entrants. Specially, I highlight how variation in immigrant scientist and engineering graduates' embeddedness in different academic programs lead them to utilize differential job search strategies relative to natives. Overall, this paper sheds light on the 'missing' link between academic organizations, job search methods and initial job placements of high-skilled workers.

My research has a number of shortcomings that should be noted. I could not collect any information about respondents' dissertation advisors, because neither the 2001 SDR nor the 1998-2000 SED had any information on the national origin of respondents' dissertation committee members or the ethnic composition of faculty in academic programs. One recent study (e.g., Main, 2011) reported that while the gender of faculty advisor serving on the dissertation committee as chair or minor member did not have a direct impact on female graduates' career outcomes, the proportion of female faculty in the department was positively associated with academic employment outcomes for female students. Although the evidence is preliminary and based on data

from only one large organization, this merits further investigation. In fact, exploring the extent to which co-ethnic matches between doctoral students and faculty advisors impact graduates' job search outcomes remain an important avenue for future research. I propose to compile data on the ethnic composition of immigrant graduates' dissertation advisors in a future iteration of the project. The plan is to construct a binary variable indicating if there was at least one co-ethnic faculty served on the respondent's dissertation committee as chair or minor member to rule out the possibility of an omitted variable bias in my analyses.

Furthermore, since my study was based on data collected during 2001, replicating these findings for more recent samples, and exploring whether there is any cohort effect on the relationship between immigrant status, co-national alumni and job search strategies must await further comparative research. Given the growing importance of immigrant scientists and engineers to the U.S. workforce as well as the increasing presence of immigrant doctoral students in academic departments, such research is of both practical and theoretical interest in understanding today's diverse workforce.

Table 2.1: Descriptive characteristics of respondents

	All (N=2,758)	**Natives 82.81% (2,284)**	**Immigrants 17.19% (474)**
Major fields of study			
Computer & mathematical sciences	8.99% (248)	7.97% (182)	13.92% (66)
Biological sciences	16.72% (461)	16.77% (383)	16.46% (78)
Agricultural & related sciences*	5.87% (162)	5.82% (133)	6.12% (29)
Medical & other health sciences*	6.64% (183)	7.14% (163)	4.22% (20)
Physical & environmental sciences	16.46% (454)	15.98% (365)	18.78% (89)
Social & behavioral sciences	25.60% (706)	28.55% (652)	11.39% (54)
Engineering	19.72% (544)	17.78% (406)	29.11% (138)
Male	56.56% (1,560)	54.42% (1,243)	66.88% (317)
Age at PhD	33.24	33.50	31.98
Race			
White	64.83% (1,788)	71.76% (1,639)	31.43% (149)
Asian	23.13% (638)	14.32% (327)	65.61% (311)
Other minorities	12.04% (332)	13.92% (318)	2.95% (14)
Married	56.74% (1,565)	59.28% (1,300)	60.92% (265)
Dependents	24.58% (678)	24.88% (540)	31.65% (138)

*The fields with asterisks were not ranked by the 1995 NRC report.

Table 2.2: Descriptive statistics for ten job-search methods

Type of job search methods used	Natives (number of cases)	Immigrants (number of cases)	Is the difference significant (t-test)?
Faculty	66.42% (1,517)	72.15% (342)	Yes: p=.015 < .05
Market recruiters	11.21% (256)	18.99% (90)	Yes: p=.00 < .001
Career office	18.74% (428)	26.79% (127)	Yes: p=.00 < .001
Professional meetings	43.96% (1,004)	50.21% (238)	Yes: p=.01 < .05
Electronic postings	55.04% (1,257)	61.08% (290)	Yes: p=.01 < .05
Newspaper	18.70% (427)	21.31% (101)	No: p=.19
Professional journals	48.47% (1,107)	49.79% (236)	No: p=.60
Informal friends	70.93% (1,620)	65.40% (310)	Yes: p=.02 < .05
Direct contacts with company	35.68% (815)	41.77% (198)	Yes: p=.01 < .05
Other – unidentified	6.17% (141)	0.84% (4)	Yes: p=.00 < .001

Table 2.3: Distribution of job search methods

Number of job search methods used: 1-9	All - Mean number of job search methods used	Natives	Immigrants	Is the difference significant (t-test)?
	3.81 (.04)	3.75 (.04)	4.08 (.09)	Yes: p=.00 < .001
1		13.62% (311)	7.81% (37)	
2		15.59% (356)	16.88% (80)	
3		17.56% (401)	17.09% (81)	
4		19.05% (435)	16.24% (77)	
5		15.76% (360)	17.30% (82)	
6		9.94% (227)	13.92% (66)	
7		5.74% (131)	6.96% (33)	
8		1.75% (40)	2.32% (11)	
9		1.01% (23)	1.48% (7)	

Table 2.4: Distribution of respondents utilizing only one job search method

Type of job search methods used	All	Natives (number of cases)	Immigrants (number of cases)	Is the difference significant (t-test)?
	348	89.37% (311)	10.63% (37)	Yes: p=.00 < .001
Faculty		18.33% (57)	48.65% (18)	Yes: p=.00 < .001
Market recruiters		.32% (1)	0% (0)	No: p=.73
Career office		2.25% (7)	5.41% (2)	No: p=.25
Professional meetings		.96% (3)	5.41% (2)	Yes: p=.03 < .05
Electronic postings		6.75% (21)	10.81% (4)	No: p=.37
Newspaper		.96% (3)	0% (0)	No: p=.55
Professional journals		3.22% (10)	2.70% (1)	No: p=.87
Informal friends		27.01% (84)	13.51% (5)	No: p=.028< .10
Direct contacts with company		10.61% (33)	8.11% (3)	No: p=.64
Other – unidentified		29.58% (92)	5.41% (2)	Yes: p=.00 < .001

Table 2.5: Distribution of respondents' labor-market outcomes by job-search method (N=2,410)

	Job search method used: percentage (count)			Most effective method leading to a first career-path job		
	All	Natives	Immigrants	All	Natives	Immigrants
Faculty	74.02% (1,784)	74% (1,460)	74.14% (324)	24.27% (585)	24.87% (475)	26.57% (110)
Market recruiters	14.32% (345)	12.92%** (255)	20.59%** (90)	1.99% (48)	1.94% (37)	2.66% (11)
Career office	22.66% (546)	21.34%** (421)	28.60%** (125)	3.82% (92)	3.72% (71)	5.07% (21)
Professional meetings	51.33% (1,237)	50.73% (1,001)	54% (236)	5.85% (141)	6.34% (121)	4.83% (20)
Electronic postings	63.15% (1,522)	62.65% (1,236)	65.45% (286)	14.90% (359)	14.61%* (279)	19.32% * (80)
Newspapers	21.78% (525)	21.49% (424)	23.11% (101)	1.87% (45)	1.94% (37)	1.93% (8)
Professional journals	55.27% (1,332)	55.60% (1,097)	53.78% (235)	7.59% (183)	8.06% (154)	7% (29)
Informal friends	76.39% (1,841)	77.85%** (1,536)	69.79%** (305)	25.02% (603)	27.28%** (521)	19.81% ** (82)
Direct contacts with company	40.54% (977)	39.64% (782)	44.62% (195)	10.04% (242)	9.95% (190)	12.56% (52)
Other – unidentified	2.12% (51)	2.48%* (49)	0.46%* (2)	1.08% (26)	1.31% (25)	0.24% (1)

*The native-immigrant difference is significant at p<.05
**The native-immigrant difference is significant at p<.001

Table 2.6a: Doctorates awarded to Chinese students by top 10 U.S. universities in science & engineering fields by city, state & MSA location: FY1993-1998

Institution, City, State	Count of Co-nationals: FY 1993-1998	Rank of the Institution	Foreign-born Population with China as the Place of Birth: 2000 US Census ('000)	Rank of the MSA in terms of the Concentration of Chinese population
Ohio State University, Columbus, OH	175	1	4,037	25
Texas A&M University, College Station, TX	167	2	985	69
University of Minnesota – twin cities, Minneapolis, MN	152	3	6,167	17
Purdue University, West Lafayette, IN	138	4	1,045	62
University of Illinois -Urbana-Champaign, IL	136	5	1,703	41
University of Buffalo, Buffalo, NY	124	6	1,641	42
Pennsylvania State University, University Park, Pennsylvania	119	7	1,103	61
Columbia University, New York City, NY	118	8	264,704	1
Rutgers University, new Brunswick, NJ	116	9	264,704	1
Cornell University, Ithaca, NY	103	10	880	74

Table 2.6b: Doctorates awarded to Indian students by top 10 U.S. universities in science & engineering fields by city, state & MSA location: FY1993-1998

Institution, City, State	Count of Co-nationals: FY 1993-1998	Rank of the Institution	Foreign-born Population with India as the Place of Birth: 2000 US Census ('000)	Rank of the MSA in terms of the Concentration of Indian population
Purdue University, West Lafayette, IN	171	1	1,106	70
Ohio State University, Columbus, OH	170	2	6,682	19
Pennsylvania State University, University Park, Pennsylvania	152	3	874	76
University of Texas –Austin, TX	147	4	6,408	20
Texas A&M University, College Station, TX	130	5	1,169	66
University of Minnesota – twin cities, Minneapolis, MN	124	6	9,072	14
University of Illinois at Urbana-Champaign, IL	123	7	1,244	63
University of Maryland – College Park, College Park, MD	115	8	55,554	5
Cornell University, Ithaca, NY	105	9	608	87
University of Michigan – Ann Arbor, MI	98	10	30,562	8

Table 2.6c: Doctorates awarded to Korean students by top 10 U.S. universities in science & engineering fields by city, state & MSA location: FY1993-1998

Institution, City, State	Count of Co-nationals: FY 1993-1998	Rank of the Institution	Foreign-born Population with Korea as the Place of Birth: 2000 US Census ('000)	Rank of the MSA in terms of the Concentration of Korean population
Texas A&M University, College Station, TX	232	1	867	67
University of Texas –Austin, TX	206	2	3,865	21
Ohio State University, Columbus, OH	172	3	3,098	25
University of Wisconsin – Madison, WI	167	4	1,653	47
University of Illinois at Urbana-Champaign, IL	145	5	1882	39
University of Michigan – Ann Arbor, MI	145	5	10,742	12
Purdue University, West Lafayette, IN	138	7	799	71
University of Florida, Gainesville, FL	114	8	811	70
Pennsylvania State University, University Park, Pennsylvania	111	9	836	69
University of Minnesota – twin cities, Minneapolis, MN	108	10	9,063	13

Table 2.6d: Doctorates awarded to Taiwanese students by top 10 U.S. universities in science & engineering fields by city, state & MSA location: FY1993-1998

Institution, City, State	Count of Co-nationals: FY 1993-1998	Rank of the Institution	Foreign-born Population with Taiwan as the Place of Birth: 2000 US Census ('000)	Rank of the MSA in terms of the Concentration of Taiwanese population
University of Wisconsin – Madison, WI	218	1	630	37
Ohio State University, Columbus, OH	209	2	1,734	20
University of Michigan – Ann Arbor, MI	208	3	3,724	13
Purdue University, West Lafayette, IN	195	4	567	42
University of Texas –Austin, TX	175	5	2,553	16
Pennsylvania State University, University Park, Pennsylvania	168	6	258	67
University of Maryland – College Park, College Park, MD	161	7	12,338	4
University of California – Los Angeles, CA	160	8	90,731	1
Texas A&M University, College Station, TX	129	9	387	55
University of Southern California – Los Angeles, CA	124	10	90,731	1

Table 2.7: Variable means and standard deviations for the full sample (N=2758)

Variable	N	Mean	S.D.
1. Faculty	2,758	.67	.47
2. Market recruiters	2,758	.13	.33
3. Career office	2,758	.20	.40
4. Professional meetings	2,758	.45	.50
5. Electronic postings	2,758	.56	.50
6. Newspapers	2,758	.19	.39
7. Professional journals	2,758	.49	.50
8. Informal friends	2,758	.70	.46
9. Direct contacts with company	2,758	.37	.48
10. Other – unidentified	2,758	.05	.22
11. Immigrant status (=1)	2,758	.17	.38
12. Co-national alumni: strict NRC sample (binary)	2,397	.51	.50
13. Co-national alumni: lax NRC sample (binary)	2,604	.51	.50
13a. Co-national alumni – Immigrant	411	4.57	6.61
13b. Co-national alumni – Native	2,193	69.95	54.15
13c. Co-national alumni combined	2,604	59.63	55.18
14. Age at PhD completion	2,758	33	6
15. Male (=1)	2,758	.57	.50
16. Married (=1)	2,628	.60	.49
17. Dependent children (=1)	2,606	.26	.44
18. Sector: Academia/research institute	2,667	.33	.47
19. Sector: Government	2,667	.26	.44
20. Sector: Industry – for-profit	2,667	.15	.36
21. Sector: Industry – non-profit	2,667	.26	.44
22. Public university (=1)	2,758	.69	.46
23. Program rank – tier I: strict NRC sample	2,490	.27	.44
24. Program rank – tier II: strict NRC sample	2,490	.19	.39
25. Program rank – tier III: strict NRC sample	2,490	.18	.38
26. Program rank – tier IV: strict NRC sample	2,490	.37	.48
27. Program rank – tier I: lax NRC sample	2,747	.25	.43
28. Program rank – tier II: lax NRC sample	2,747	.24	.43

Variable	N	Mean	S.D.
29. Program rank – tier III: lax NRC sample	2,747	.26	.44
30. Program rank – tier IV: lax NRC sample	2,747	.25	.43
31. Time-to-degree completion	2,661	.53	.50
32. Size of PhD program: strict NRC sample	2,446	280	231
33. Size of PhD program: lax NRC sample	2,704	264	226
34. ln(size of PhD program): strict NRC sample	2,446	.50	.50
35. ln(size of PhD program): lax NRC sample	2,704	.50	.50
36. % of PhDs awarded to natives (=1)	2,704	.52	.50
37. Teaching assistantship	2,570	.16	.37
38. Research assistantship	2,570	.31	.46
39. Fellowship	2,570	.23	.42
40. Loan/personal/family funds	2,570	.22	.42
41. Others	2,570	.08	.27
42. Computer & mathematical sciences: strict NRC sample	2,490	.10	.30
43. Biological sciences: strict NRC sample	2,490	.22	.41
44. Physical & environmental sciences: strict NRC sample	2,490	.18	.39
45. Social & behavioral sciences: strict NRC sample	2,490	.28	.45
46. Engineering: strict NRC sample	2,490	.22	.41
47. Computer & mathematical sciences: lax NRC sample	2,758	.09	.29
48. Biological sciences: lax NRC sample	2,758	.20	.40
49. Agricultural & related sciences: lax NRC sample	2,758	.03	.17
50. Medical & other health sciences: lax NRC sample	2,758	.07	.25
51. Physical & environmental sciences: lax NRC sample	2,758	.16	.37
52. Social & behavioral sciences: lax NRC sample	2,758	.26	.44
53. Engineering: lax NRC sample	2,758	.20	.40
54. Number of job search methods used	2,758	3.81	1.90

Table 2.8: Variable correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Faculty	1.00									
2. Market recruiters	-.01	1.00								
3. Career office	.09*	.20*	1.00							
4. Professional meetings	.28*	.03	.11*	1.00						
5. Electronic postings	.11*	.17*	.17*	.23*	1.00					
6. Newspapers	-.04*	.21*	.14*	.03	.30*	1.00				
7. Professional journals	.20*	.09*	.09*	.29*	.44*	.23*	1.00			
8. Informal friends	.21*	.07*	.07*	.21*	.08*	.07*	.09*	1.00		
9. Direct contacts with company	-.03	.18*	.14*	.08*	.06*	.12*	.06*	.14*	1.00	
10. Other – unidentified	-.25*	-.06*	-.10*	-.17*	-.22*	-.09*	-.18*	-.26*	-.11*	1.00
11. Immigrant status	.05*	.09*	.08*	.05*	.05*	.03	.01	-.05*	.05*	-.09*
12. Co-national alumni: strict NRC sample (binary)	.09*	-.02	.10*	.01	-.02	-.05*	-.01	.05*	-.03	-.06*
13. Co-national alumni: lax NRC sample (binary)	.07*	-.03	.10*	-.01	-.00	-.04	-.00	.05*	-.02	-.06*
14. Age at PhD completion	-.23*	-.01	-.12*	-.10*	-.10*	.06*	-.04	-.07*	-.03	.16*
15. Male	.02	.10*	.10*	-.02	.04*	-.02	.00	.00	.00	-.04
16. Married	-.09*	-.00	-.02	-.07*	-.04	.03	-.05*	-.02	.02	.03
17. Dependent children	-.12*	-.01	-.03	-.10*	-.06*	.06*	-.03	-.06*	.04*	.10*
18. Sector: Academia/research institute	.03	-.15*	-.08*	.02	.03	-.01	.08*	-.05*	-.12*	-.02

Variable	1	2	3	4	5	6	7	8	9	10
19. Sector: Government	.02	-.09*	-.10*	.01	-.04*	-.04*	-.02	-.01	-.00	.03
20. Sector: Industry for-profit.	.05*	-.04*	-.05*	.00	-.01	-.03	-.00	.01	-.00	-.00
21. Sector: Industry – non-profit	-.10*	.28*	.23*	-.03	.01	.07*	-.07*	.06*	.13*	-.01
22. Public university	.01	.03	-.07*	.04	.05*	.04*	.04*	.01	.00	.01
23. Program rank – tier I: strict NRC sample	.11*	-.03	.16*	-.01	-.03	-.11*	-.05*	.06*	-.01	-.05*
24. Program rank –tier II: strict NRC sample	.01	.00	.00	.01	.01	.01	.00	.02	-.01	-.01
25. Program rank –tier III: strict NRC sample	-.02	.01	-.01	.04*	.01	.02	.04	-.02	.03	-.00
26. Program rank –tier IV: strict NRC sample	-.09*	.02	-.14*	-.03	.01	.08*	.02	-.05*	-.01	.05*
27. Program rank – tier I: lax NRC sample	.10*	-.04	.15*	-.01	-.03	-.10*	-.05*	.04*	-.01	-.04*
28. Program rank –tier II: lax NRC sample	.04	.00	.01	.01	.01	-.01	.00	.03	-.01	-.01
29. Program rank –tier III: lax NRC sample	-.04*	.03	-.05*	.04	.02	.04*	.05*	-.03	.03	.00
30. Program rank –tier IV: lax NRC sample	-.09*	.01	-.11*	-.04	.01	.06*	.00	-.04*	-.00	.05*
31. Time-to-degree completion	-.09*	-.04*	-.03	-.10*	-.06*	.01	-.05*	.01	-.02	.07*
32. ln(size of PhD program): strict NRC sample	.08*	-.06*	.14*	.02	-.04*	-.08*	-.04*	.08*	-.03	-.03

Variable	1	2	3	4	5	6	7	8	9	10
33. ln(size of PhD program): lax NRC sample	.07*	-.05*	.15*	-.01	-.04	-.07*	-.04	.07*	-.03	-.02
34. % of PhDs awarded to natives	.00	-.12*	-.14*	.02	-.03	.02	.02	.01	-.06*	-.01
35. Teaching assistantship	.03	.02	.03	.07*	.13*	.07*	.11*	-.01	-.03	-.09*
36. Research assistantship	.11*	.05*	.10*	.04*	.03	-.03	.00	.04*	.05*	-.12*
37. Fellowship	.06*	-.01	.01	.01	-.01	-.07*	-.01	.02	-.00	-.06*
38. Loan/personal/family	-.15*	-.05*	-.10*	-.07*	-.08*	.07*	-.04*	-.00	.00	.13*
39. Others	-.09*	-.02	-.06*	-.08*	-.08*	-.04*	-.08*	-.09*	-.04*	.22*
40. Computer & mathematical sciences: strict NRC sample	.02	.08*	-.05*	.01	.06*	-.02	.00	-.00	-.01	.01
41. Biological sciences: strict NRC sample	.06*	-.05*	-.14*	.02	-.04	-.07*	-.00	-.03	.01	-.02
42. Physical & environmental sciences: strict NRC sample	.01	.02	.08*	-.01	.04	.00	.04*	.03	.01	-.04
43. Social & behavioral sciences: strict NRC sample	-.04*	-.12*	-.06*	.03	.01	.08*	.03	.01	-.08*	-.01
44. Engineering: strict NRC sample	-.03	.11*	.17*	-.05*	-.06*	-.01	-.07*	-.01	.07*	.06*
45. Computer & mathematical sciences: lax NRC sample	.02	.07*	-.04*	.01	.06*	-.02	.00	.00	-.01	.01
46. Biological sciences: lax NRC sample	.05*	-.05*	-.12*	.01	-.03	-.06*	-.00	-.02	.01	-.03

Variable	1	2	3	4	5	6	7	8	9	10
47. Agricultural & related sciences: lax NRC sample	-.01	.01	-.02	.04*	-.01	-.04*	.02	-.03	.00	.04*
48. Medical & other health sciences: lax NRC sample	-.00	-.02	-.08*	.03	-.04	.01	.01	-.03	-.02	.02
49. Physical & environmental sciences: lax NRC sample	.01	.02	.09*	-.02	.04*	.00	.04*	.03	.01	-.04*
50. Social & behavioral sciences: lax NRC sample	-.04*	-.11*	-.04*	.02	.02	.08*	.02	.02	-.07*	-.02
51. Engineering: lax NRC sample	-.03	.10*	.17*	-.05*	-.05*	-.00	-.07*	-.01	.07*	.05*
52. Number of job search methods used	.44*	.34*	.40*	.56*	.61*	.41*	.62*	.45*	.39*	-.24*

Table 2.8 (continued)

Variable	11	12	13	14	15	16	17	18	19	20	21	22	23
11. Immigrant status	1.00												
12. Co-national alumni: strict NRC sample (binary)	.03	1.00											
13. Co-national alumni: lax NRC sample (binary)	.02	.92*	1.00										
14. Age at PhD completion	-.02	-.12*	-.13*	1.00									
15. Male	.09*	-.03	-.01	-.06*	1.00								
16. Married	.01	-.01	-.01	.19*	.05*	1.00							
17. Dependent children	.06*	-.10*	-.11*	.39*	.10*	.42*	1.00						
18. Sector: Academia/research institute	-.09*	-.01	-.02	.16*	-.09*	.04*	.04	1.00					
19. Sector: Government	-.12*	.00	.00	-.04*	-.05*	-.03	-.02	-.41*	1.00				
20. Sector: Industry for-profit.	.11*	-.04	-.03	-.03	.03	-.06*	-.01	-.30*	-.25*	1.00			
21. Sector: Industry – non-profit	.13*	.04	.04	-.11*	.13*	.03	-.02	-.42*	-.35*	-.25*	1.00		
22. Public university	-.03	.03	.01	.09*	.03	.06*	.08*	.05*	-.01	-.00	-.05*	1.00	
23. Program rank –tier I: strict NRC sample	.00	.35*	.33*	-.22*	.04	-.08*	-.14*	-.03	-.03	-.02	.09*	-.24*	1.00
24. Program rank –tier II: strict NRC sample	.01	.18*	.19*	-.03	.02	.01	-.00	-.02	-.00	.01	.01	.11*	-.29*
25. Program rank –tier III: strict NRC sample	.06*	-.14*	-.13*	.05*	.01	.02	.03	-.03	.02	.04*	-.02	.11*	-.28*

Variable	11	12	13	14	15	16	17	18	19	20	21	22	23
26. Program rank –tier IV: strict NRC sample	-.05*	-.36*	-.36*	.19*	-.05*	.04	.11*	.07*	.02	-.02	-.08*	.05*	-.46*
27. Program rank –tier I: lax NRC sample	-.00	.33*	.29*	-.20*	.01	-.07*	-.13*	-.04*	-.01	-.03	.07*	-.25*	.93*
28. Program rank –tier II: lax NRC sample	.02	.21*	.20*	-.04*	.01	-.00	-.01	-.00	-.01	.02	.00	.12*	-.19*
29. Program rank –tier III: lax NRC sample	.02	-.19*	-.18*	.07*	-.01	.03	.03	-.02	.00	.02	-.01	.14*	-.35*
30. Program rank –tier IV: lax NRC sample	-.04	-.35*	-.31*	.17*	-.02	.05*	.11*	.06*	.01	-.01	-.07*	-.01	-.37*
31. Time-to-degree completion	-.13*	-.00	.00	.33*	-.04	.02	.08*	.06*	.00	-.00	-.07*	.00	.01
32. ln(size of PhD program): strict NRC sample	-.03	.69*	.65*	-.14*	.00	-.03	-.13*	-.01	-.03	-.02	.05*	-.01	.43*
33. ln(size of PhD program): lax NRC sample	-.01	.67*	.65*	-.16*	.04*	-.04*	-.12*	-.04	-.02	-.01	.06*	-.05*	.40*
34. % of PhDs to natives	-.15*	.07*	.08*	.05*	-.21*	.01	-.07*	.12*	.11*	-.01	-.23*	.06*	-.13*
35. Teaching assistantship	.05*	-.07*	-.05*	-.06*	.04*	-.02	-.06*	.09*	-.05*	.00	-.05*	.11*	-.08*
36. Research assistantship	.24*	.11*	.10*	-.16*	.13*	-.03	-.04	-.17*	-.04	.04*	.18*	.07*	.07*
37. Fellowship	-.07*	.05*	.05*	-.17*	-.04*	-.07*	-.12*	.03	.04*	-.01	-.07*	-.16*	.20*
38. Loan/personal/family funds	-.20*	-.07*	-.07*	.33*	-.14*	.10*	.16*	.12*	-.01	-.03	-.08*	.02	-.18*
39. Others	-.07*	-.06*	-.07*	.12*	-.01	.03	.08*	-.07*	.09*	-.01	-.01	-.06*	-.06*
40. Computer & mathematical sciences: strict NRC sample	.08*	-.24*	-.26*	-.00	.03	-.01	.01	.04	-.09*	.01	.04*	.03	.06*

Variable	11	12	13	14	15	16	17	18	19	20	21	22	23
41. Biological sciences: strict NRC sample	-.01	.01	.01	-.07*	-.08*	.00	-.02	-.04*	.18*	.04*	-.17*	.00	-.01
42. Physical & environmental sciences: strict NRC sample	.02	-.04	-.05*	-.12*	.10*	-.01	-.03	-.14*	.06*	.05*	.05*	.06*	.00
43. Social & behavioral sciences: strict NRC sample	-.16*	.07*	.11*	.18*	-.24*	.02	-.04*	.26*	-.03	-.06*	-.20*	-.08*	-.16*
44. Engineering: strict NRC sample	.11*	.12*	.10*	-.02	.22*	-.01	.09*	-.14*	-.14*	-.03	.31*	.01	.14*
45. Computer & MS: lax NRC sample	.08*	-.23*	-.22*	-.02	.04*	-.01	.00	.03	-.09*	.01	.05*	.02	.06*
46. Biological sciences: lax NRC sample	-.00	.01	.05*	-.09*	-.05*	.00	-.03	-.05*	.17*	.04*	-.15*	-.02	-.01
47. Agricultural & related sciences: lax NRC sample	.00	-.03	-.16*	.03	.01	-.00	.06*	-.00	-.01	.02	.00	.10*	.
48. Medical & other health sciences: lax NRC sample	-.04*	-.02	-.18*	.15*	-.15*	-.00	.06*	.11*	.00	-.05*	-.07*	.06*	.
49. Physical & environmental sciences: lax NRC sample	.03	-.03	-.01	-.13*	.11*	-.01	-.04*	-.14*	.06*	.05*	.05*	.04*	.00
50. Social & behavioral sciences: lax NRC sample	-.15*	.07*	.14*	.14*	-.20*	.02	-.06*	.23*	-.02	-.05*	-.18*	-.10*	-.16*
51. Engineering: lax NRC sample	.11*	.12*	.13*	-.04*	.22*	-.01	.06*	-.14*	-.13*	-.02	.30*	-.01	.14*
52. Number of job search methods used	.06*	.02	.03	-.15*	.04	-.06*	-.07*	-.04*	-.05*	-.01	.10*	.03	.02

Table 2.8 (continued)

Variable	24	25	26	27	28	29	30	31	32	33	34	35	36
24. Program rank –tier II: strict NRC sample	1.00												
25. Program rank –tier III: strict NRC sample	-.22*	1.00											
26. Program rank –tier IV: strict NRC sample	-.37*	-.35*	1.00										
27. Program rank –tier I: lax NRC sample	-.27*	-.26*	-.43*	1.00									
28. Program rank –tier II: lax NRC sample	.86*	-.21*	-.35*	-.33*	1.00								
29. Program rank –tier III: lax NRC sample	-.28*	.75*	-.05*	-.34*	-.33*	1.00							
30. Program rank –tier IV: lax NRC sample	-.29*	-.28*	.79*	-.33*	-.33*	-.34*	1.00						
31. Time-to-degree completion	-.01	.04	-.03	.01	-.01	.03	-.03	1.00					
32. ln(size of PhD program): strict NRC sample	.17*	-.15*	-.42*	.43*	.18*	-.20*	-.40*	.02	1.00				
33. ln(size of PhD program): lax NRC sample	.18*	-.12*	-.42*	.36*	.17*	-.18*	-.35*	.03	.92*	1.00			
34. % of PhDs awarded to natives	.09*	-.04	.07*	-.11*	.09*	-.02	.04*	.06*	-.02	-.03	1.00		
35. Teaching assistantship	.03	.05*	.01	-.09*	.02	.05*	.02	-.02	-.05*	-.04*	-.02	1.00	

Variable	24	25	26	27	28	29	30	31	32	33	34	35	36
36. Research assistantship	.03	.02	-.10*	.06*	.03	.02	-.11*	-.07*	.09*	.11*	-.16*	-.30*	1.00
37. Fellowship	-.04	-.08*	-.09*	.20*	-.01	-.10*	-.09*	-.03	.05*	.05*	.04*	-.24*	-.36*
38. Loan/personal/family	-.04	.03	.17*	-.17*	-.04*	.03	.19*	.10*	-.08*	-.09*	.14*	-.24*	-.36*
39. Others	.02	-.01	.05*	-.03	.01	.01	.01	.04	-.05*	-.05*	.01	-.13*	-.20*
40. Computer & mathematical sciences: strict NRC sample	-.09*	.01	.02	.04*	-.08*	.01	.03	-.03	-.22*	-.22*	-.25*	.17*	-.08*
41. Biological sciences: strict NRC sample	-.02	.00	.02	-.02	.04*	.02	-.04*	.04	-.07*	-.07*	.36*	-.10*	.01
42. Physical & environmental sciences: strict NRC sample	.03	.06*	-.07*	.01	.00	.05*	-.06*	-.05*	.01	-.00	-.06*	.03	.18*
43. Social & behavioral sciences: strict NRC sample	.04	-.01	.13*	-.13*	-.00	-.00	.14*	.09*	.06*	.07*	.38*	.07*	-.28*
44. Engineering: strict NRC sample	.01	-.05*	-.10*	.12*	.02	-.07*	-.07*	-.06*	.15*	.16*	-.53*	-.12*	.19*
45. Computer & mathematical sciences: lax NRC sample	-.09*	.01	.02	.04	-.08*	.00	.04*	-.03	-.22*	-.19*	-.24*	.17*	-.07*
46. Biological sciences: lax NRC sample	-.02	.00	.02	-.02	.03	.01	-.02	.04	-.07*	-.03	.33*	-.08*	.02
47. Agricultural & related sciences: lax NRC sample	.	.	.	.01	.05*	.00	-.06*	-.04	.	-.05*	-.14*	-.06*	.06*
48. Medical & other health sciences: lax NRC sample	.	.	.	.04*	.03	.05*	-.11*	-.01	.	-.25*	.13*	-.05*	-.09*

Variable	24	25	26	27	28	29	30	31	32	33	34	35	36
49. Physical & environmental sciences: lax NRC sample	.03	.06*	-.07*	.00	-.01	.04*	-.04	-.05*	.01	.03	-.06*	.04	.17*
50. Social & behavioral sciences: lax NRC sample	.04	-.01	.13*	-.13*	-.01	-.01	.15*	.09*	.06*	.11*	.34*	.08*	-.26*
51. Engineering: lax NRC sample	.01	-.05*	-.10*	.11*	.01	-.07*	-.05*	-.06*	.15*	.19*	-.50*	-.11*	.18*
52. Number of job search methods used	.01	.02	-.04*	.01	.02	.02	-.05*	-.09*	.02	.01	-.05*	.10*	.08*

Table 2.8 (continued)

Variable	37	38	39	40	41	42	43	44	45	46	47	48	49
37. Fellowship	1.00												
38. Loan/personal/family	-.29*	1.00											
39. Others	-.16*	-.16*	1.00										
40. Computer & mathematical sciences: strict NRC sample	-.02	-.04*	-.01	1.00									
41. Biological sciences: strict NRC sample	.17*	-.13*	.04*	-.17*	1.00								
42. Physical & environmental sciences: strict NRC sample	-.05*	-.13*	-.06*	-.16*	-.25*	1.00							
43. Social & behavioral sciences: strict NRC sample	-.06*	.34*	-.02	-.21*	-.33*	-.30*	1.00						
44. Engineering: strict NRC sample	-.04*	-.08*	.04*	-.18*	-.28*	-.25*	-.33*	1.00					
45. Computer & mathematical sciences: lax NRC sample	-.01	-.05*	-.02	1.00*	-.17*	-.16*	-.21*	-.18*	1.00				
46. Biological sciences: lax NRC sample	.17*	-.14*	.02	-.17*	1.00 *	-.25*	-.33*	-.28*	-.15*	1.00			
47. Agricultural & related sciences: lax NRC sample	-.01	-.01	.01	.	.	.	.	.	-.06*	-.09*	1.00		
48. Medical & other health sciences: lax NRC sample	-.04*	.12*	.09*	.	.	.	.	.	-.08*	-.13*	-.05*	1.00	

Variable	37	38	39	40	41	42	43	44	45	46	47	48	49
49. Physical & environmental sciences: lax NRC sample	-.05*	-.14*	-.06*	-.16*	-.25*	1.00*	-.30*	-.25*	-.14*	-.22*	-.08*	-.12*	1.00
50. Social & behavioral sciences: lax NRC sample	-.05*	.29*	-.04	-.21*	-.33*	-.30*	1.00 *	-.33*	-.18*	-.29*	-.10*	-.16*	-.26*
51. Engineering: lax NRC sample	-.03	-.09*	.03	-.18*	-.28*	-.25*	-.33*	1.00*	-.16*	-.24*	-.09*	-.13*	-.22*
52. Number of job search methods used	-.01	-.09*	-.12*	.02	-.05*	.04*	-.02	.02	.02	-.04*	.00	-.03	.04*

Table 2.8 (continued)

Variable	50	51	52
50. Social & behavioral sciences: lax NRC sample	1.00		
51. Engineering: lax NRC sample	-.29*	1.00	
52. Number of job search methods used	-.02	.02	1.00

*p<.05

Table 2.9: Logistic regression models predicting the use of informal friends for job search (Using strict NRC sample)

Variable	Model 1 (N=2,058)	Model 2 (N=2,058)	Model 3 (N=2,058)	Model 4 (N=2,058)
Predictors				
Immigrant status (=1)		-.55 (.16)**	-.54 (.16)**	-.44 (.24)$^{+}$
Co-national alumni (binary)			-.06 (.16)	-.01 (.18)
Immigrant status x Co-national alumni				-.20 (.33)
Control				
Age at PhD completion	.00 (.01)	.00 (.01)	.00 (.01)	.00 (.01)
Male	.07 (.12)	.07 (.12)	.06 (.12)	.07 (.12)
Married	.10 (.12)	.10 (.12)	.10 (.12)	.11 (.12)
Dependent children	-.16 (.15)	-.13 (.15)	-.13 (.15)	-.12 (.15)
Sector: Government	.32 (.15)*	.30 (.15)*	.30 (.15)*	.30 (.15)*
Sector: Industry for-profit	.46 (.18)*	.52 (.18)**	.51 (.18)**	.51 (.18)**
Sector: Industry – non-profit	.27 (.16)$^{+}$	.30 (.16)$^{+}$	.30 (.16)$^{+}$	.30 (.16)$^{+}$
Public university (=1)	.07 (.13)	.04 (.13)	.04 (.13)	.04 (.13)
Program rank –tier II	-.02 (.18)	-.01 (.18)	-.01 (.18)	-.01 (.18)
Program rank –tier III	-.22 (.19)	-.20 (.19)	-.21 (.19)	-.20 (.19)
Program rank –tier IV	-.05 (.18)	-.05 (.18)	-.06 (.19)	-.05 (.19)
Time-to-degree completion	.23 (.12)*	.18 (.12)	.18 (.12)	.18 (.12)
Field: Biological sciences	-.04 (.25)	-.08 (.25)	-.07 (.25)	-.07 (.25)
Field: Physical & environmental sciences	-.16 (.24)	-.21 (.24)	-.21 (.24)	-.21 (.24)
Field: Social & behavioral sciences	.03 (.25)	-.03 (.25)	-.02 (.25)	-.02 (.25)
Field: Engineering	-.23 (.23)	-.24 (.23)	-.23 (.23)	-.23 (.23)

Variable	**Model 1 (N=2,058)**	**Model 2 (N=2,058)**	**Model 3 (N=2,058)**	**Model 4 (N=2,058)**
Size of PhD program (natural log)	.43 (.14)**	.44 (.14)**	.47 (.17)**	.44 (.18)*
% of PhDs awarded to natives (binary)	.03 (.16)	.02 (.16)	.02 (.16)	.01 (.16)
Funding: Research assistant	.37 (.18)*	.41 (.18)*	.42 (.18)*	.42 (.18)*
Funding: Fellowship	.45 (.19)*	.42 (.19)*	.42 (.19)*	.41 (.19)*
Funding: Loan/personal/family funds	.52 (.19)**	.44 (.19)*	.44 (.20)*	.44 (.20)*
Funding: Others	.01 (.24)	-.05 (.24)	-.05 (.24)	-.05 (.24)
Number of job search methods used	.72 (.04)***	.72 (.04)***	.72 (.04)***	.72 (.04)***
Intercept	.32 (.28)	.50 (.29)$^{+}$	.50 (.29)$^{+}$	.49 (.29)$^{+}$
Goodness-of-fit test	p=.52	p=.56	p=.54	p=.51

Note: Standard errors in parentheses. *** p<.001; **p< .01; *p<.05; $^{+}$p<.10

Table 2.10: Logistic regression models predicting the effectiveness of informal friends for job search (Using strict NRC sample)

Variable	Model 1 (N=1,340)	Model 2 (N=1,340)	Model 3 (N=1,340)	Model 4 (N=1,340)
Predictors				
Immigrant status (=1)		-.11 (.19)	-.09 (.19)	-.32 (.28)
Co-national alumni (binary)			-.39 (.18)*	-.49 (.20)*
Immigrant status x Co-national alumni				.43 (.38)
Control				
Age at PhD completion	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)
Male	-.16 (.13)	-.16 (.13)	-.17 (.13)	-.17 (.13)
Married	.04 (.13)	.04 (.13)	.05 (.13)	.04 (.13)
Dependent children	.06 (.17)	.07 (.17)	.06 (.17)	.06 (.17)
Sector: Government	.13 (.17)	.13 (.17)	.13 (.17)	.13 (.17)
Sector: Industry for-profit	.28 (.20)	.29 (.20)	.29 (.20)	.29 (.20)
Sector: Industry – non-profit	.59 (.17)**	.60 (.17)**	.60 (.17)**	.60 (.17)**
Public university (=1)	-.17 (.14)	-.18 (.14)	-.14 (.14)	-.14 (.14)
Program rank –tier II	.07 (.19)	.07 (.19)	.05 (.19)	.05 (.19)
Program rank –tier III	-.08 (.21)	-.08 (.21)	-.16 (.22)	-.16 (.22)
Program rank –tier IV	.26 (.19)	.26 (.19)	.19 (.20)	.18 (.20)
Time-to-degree completion	.29 (.13)*	.28 (.13)*	.29 (.13)*	.29 (.13)*
Field: Biological sciences	-.55 (.29)$^{+}$	-.55 (.29)$^{+}$	-.44 (.29)	-.44 (.29)
Field: Physical & environmental sciences	-.03 (.26)	-.04 (.26)	.04 (.26)	.04 (.26)
Field: Social & behavioral sciences	.08 (.28)	.08 (.28)	.20 (.29)	.20 (.29)

Variable	**Model 1 (N=1,340)**	**Model 2 (N=1,340)**	**Model 3 (N=1,340)**	**Model 4 (N=1,340)**
Field: Engineering	.36 (.26)	.36 (.26)	.47 (.26)$^{+}$	.46 (.26)$^{+}$
Size of PhD program (natural log)	-.03 (.15)	-.03 (.15)	.20 (.19)	.25 (.19)
% of PhDs awarded to natives (binary)	.27 (.17)	.27 (.17)	.29 (.18)$^{+}$	.31 (.18)$^{+}$
Funding: Research assistantship	-.26 (.19)	-.26 (.19)	-.26 (.19)	-.27 (.19)
Funding: Fellowship	-.29 (.20)	-.30 (.20)	-.30 (.20)	-.30 (.20)
Funding: Loan/personal/family funds	.13 (.21)	.11 (.21)	.11 (.21)	.10 (.21)
Funding: Others	-.38 (.31)	-.39 (.31)	-.41 (.31)	-.41 (.31)
Number of job search methods used	-.28 (.04)***	-.28 (.04)***	-.28 (.04)***	-.28 (.04)***
Intercept	-.84 (.31)**	-.81 (.32)*	-.82 (.32)*	-.79 (.32)*
Goodness-of-fit test	p=.21	p=.20	p=.19	p=.18

Note: Standard errors in parentheses. *** p<.001; **p< .01; *p<.05; $^{+}$p<.10

Table 2.11: Logistic regression models predicting the use of faculty for job search (Using strict NRC sample)

Variable	Model 1 (N=2,058)	Model 2 (N=2,058)	Model 3 (N=2,058)	Model 4 (N=2,058)
Predictors				
Immigrant status (=1)		.08 (.17)	.07 (.17)	.53* (.26)
Co-national alumni (binary)			.13 (.16)	.35^{+} (.19)
Immigrant status x Co-national alumni				-.85 (.35)*
Control				
Age at PhD completion	-.05 (.01)***	-.05 (.01)***	-.05 (.01)***	-.05 (.01)***
Male	.07 (.12)	.07 (.12)	.07 (.12)	.07 (.12)
Married	-.18 (.13)	-.18 (.13)	-.18 (.13)	-.18 (.13)
Dependent children	.02 (.15)	.02 (.15)	.02 (.15)	.03 (.15)
Sector: Government	-.08 (.15)	-.08 (.15)	-.08 (.16)	-.08 (.16)
Sector: Industry for-profit	.07 (.19)	.06 (.19)	.07 (.19)	.06 (.19)
Sector: Industry – non-profit	-1.17 (.16)***	-1.18 (.16)***	-1.18 (.16)***	-1.17 (.16)***
Public university (=1)	.14 (.13)	.14 (.13)	.13 (.13)	.12 (.13)
Program rank –tier II	-.32 (.18)$^{+}$	-.32 (.18) $^{+}$	-.32 (.18) $^{+}$	-.32 (.18)$^{+}$
Program rank –tier III	-.42 (.20)*	-.42 (.20)*	-.40 (.20)*	-.38 (.20)$^{+}$
Program rank –tier IV	-.39 (.18)*	-.39 (.18)*	-.37 (.19)*	-.35 (.19)$^{+}$
Time-to-degree completion	-.16 (.12)	-.15 (.12)	-.15 (.12)	-.16 (.12)
Field: Biological sciences	-.15 (.26)	-.14 (.26)	-.16 (.27)	-.17 (.27)
Field: Physical & environmental sciences	-.58 (.25)*	-.57 (.25)*	-.58 (.25)*	-.58 (.25)*
Field: Social & behavioral sciences	-.24 (.26)	-.23 (.26)	-.25 (.26)	-.27 (.26)

Variable	**Model 1 (N=2,058)**	**Model 2 (N=2,058)**	**Model 3 (N=2,058)**	**Model 4 (N=2,058)**
Field: Engineering	-.43 (.24)$^{+}$	-.43 (.24)$^{+}$	-.45 (.24)$^{+}$	-.45 (.24)$^{+}$
Size of PhD program (natural log)	.23 (.14)	.23 (.14)	.16 (.17)	.03 (.18)
% of PhDs awarded to natives (binary)	-.00 (.16)	-.00 (.16)	-.01 (.16)	-.04 (.16)
Funding: Research assistantship	.68 (.18)***	.67 (.18)***	.67 (.18)***	.69 (.18)***
Funding: Fellowship	.28 (.19)	.29 (.19)	.28 (.19)	.28 (.19)
Funding: Loan/personal/family funds	-.17 (.19)	-.16 (.19)	-.16 (.19)	-.16 (.19)
Funding: Others	.01 (.25)	.02 (.25)	.02 (.25)	.04 (.25)
Number of job search methods used	.65 (.04)***	.65 (.04)***	.65 (.04)***	.65 (.04)***
Intercept	1.63 (.30)***	1.60 (.30)***	1.59 (.30)***	1.56 (.30)***
Goodness-of-fit test	p=.01	p=.00	p=.00	p=.00

Note: Standard errors in parentheses. *** p<.001; **p< .01; *p<.05; $^{+}$p<.10

Table 2.12: Logistic regression models predicting the effectiveness of faculty for job search (Using strict NRC sample)

Variable	Model 1 (N=1,320)	Model 2 (N=1,320)	Model 3 (N=1,320)	Model 4 (N=1,320)
Predictors				
Immigrant status (=1)		.12 (.18)	.11 (.18)	.13 (.26)
Co-national alumni (binary)			.24 (.17)	.25 (.20)
Immigrant status x Co-national alumni				-.05 (.37)
Control				
Age at PhD completion	.02 (.01)	.02 (.01)	.02 (.01)	.02 (.01)
Male	.26 (.13)*	.26 (.13)*	.27 (.13)*	.27 (.13)*
Married	.10 (.13)	.10 (.13)	.09 (.13)	.09 (.13)
Dependent children	-.25 (.18)	-.26 (.18)	-.26 (.18)	-.26 (.18)
Sector: Government	.31 (.16)$^{+}$	.32 (.16)$^{+}$	.32 (.16)$^{+}$	.32 (.16)$^{+}$
Sector: Industry for-profit	.13 (.19)	.12 (.19)	.13 (.19)	.13 (.19)
Sector: Industry – non-profit	-.30 (.19)	-.31 (.19)	-.31 (.19)	-.31 (.19)
Public university (=1)	-.36 (.14)*	-.36 (.14)*	-.38 (.14)**	-.38 (.14)**
Program rank –tier II	-.00 (.19)	-.00 (.19)	.01 (.19)	.01 (.19)
Program rank –tier III	.25 (.21)	.24 (.21)	.29 (.22)	.29 (.22)
Program rank –tier IV	.01 (.20)	.01 (.20)	.05 (.20)	.05 (.20)
Time-to-degree completion	-.51 (.13)***	-.50 (.13)***	-.50 (.13)***	-.51 (.13)***
Field: Biological sciences	.36 (.28)	.37 (.28)	.32 (.28)	.32 (.28)
Field: Physical & environmental sciences	.18 (.26)	.20 (.26)	.16 (.26)	.16 (.26)
Field: Social & behavioral sciences	.02 (.28)	.04 (.28)	-.02 (.29)	-.02 (.29)

Variable	**Model 1 (N=1,320)**	**Model 2 (N=1,320)**	**Model 3 (N=1,320)**	**Model 4 (N=1,320)**
Field: Engineering	-.35 (.26)	-.34 (.26)	-.40 (.26)	-.40 (.26)
Size of PhD program (natural log)	.14 (.15)	.15 (.15)	.02 (.18)	.01 (.19)
% of PhDs awarded to natives (binary)	-.36 (.17)*	-.36 (.17)*	-.37 (.17)*	-.37 (.17)*
Funding: Research assistantship	.75 (.20)***	.74 (.20)***	.73 (.20)***	.73 (.20)***
Funding: Fellowship	.63 (.21)**	.63 (.21)**	.62 (.21)**	.62 (.21)**
Funding: Loan/personal/family funds	.38 (.24)	.39 (.24)	.37 (.24)	.37 (.24)
Funding: Others	.91 (.30)**	.92 (.30)**	.92 (.30)**	.92 (.30)**
Number of job search methods used	-.21 (.04)***	-.21 (.04)***	-.21 (.04)***	-.21 (.04)***
Intercept	-.81 (.31)**	-.85 (.31)**	-.85 (.31)**	-.85 (.31)**
Goodness-of-fit test	p=.27	p=.30	p=.29	p=.28

Note: Standard errors in parentheses. *** p<.001; **p< .01; *p<.05; $^{+}$p<.10

Appendix II.1

Comparison of the 2001 SDR new cohort frame with the SED population

This section describes how the new cohort cases of the 2001 SDR compared with the SED target population of the survey. To begin with, I excluded all cases who had graduated before or after the July 1998 and June 2000 time frame from the SED target population (N=40,000). It reduced the SED population from 40,000 to 3,988 cases with 3,023 (75.8%) natives, defined as U.S. residents and/or citizens at the time of the receipt of their doctoral degrees, 793 immigrants (19.88%), defined as temporary U.S. residents on student/work/other temporary visa at PhD receipt, and 172 (4.31%) missing cases. Among 793 immigrants Chinese constituted the largest single group (246 cases: 31.02%), followed by Indians (89 cases: 11.22%), Koreans (73 cases: 9.2%) and Taiwanese (62 cases: 7.82%). Shares for other ethnicities accounted for 3% or less.

In order to compare how the 2001 SDR sample (N=31,366) compared with the SED population, I excluded everyone but the recent graduates who had received their first U.S. doctoral degrees between July 1998 and June 2000. The breakdown of the 2001 SDR sample was as follows:

Natives: 2,494 (78.95%);

Immigrants: 566 (17.92%) with Chinese 200 (35.34%), Indian 71 (12.54%), Korean 42 (7.42%) & Taiwanese 38 (6.71%);

Missing & visa status known: 99 (3.14%)

Although the sample compared fairly well with the target population, a couple of things needed to be noted. First, the percentages of immigrants in the sample were slightly lower due to differences in the stay rates of different national origin groups after the completion of their

studies. A recent NSF report estimated that among 2004-07 S&E doctorate recipients, more than 90% graduates from China and 89% from India had intentions to pursue their career in the U.S., and 59% and 62%, respectively, accepted firm offers of employment or postdoctoral research in the U.S. In contrast, the stay rates of students from Taiwan and Korea were much lower (National Science Board, 2010). Consistent with the report, I estimated from the SED population that immigrant students were more likely to emigrate than natives compared to their share in the population (36.36% vs. 58.74%). Among immigrants Taiwanese were more likely to emigrate (17%) than any other national origin groups. Furthermore, Chinese students were more likely to refuse to participate in the survey (26.19% refusal rate). They were also slightly harder to locate (29.41%) compared to other national origin groups.

Second, I attempted to reduce the missing values on respondents' citizenship status in the 2001 SDR sample using the 2003 SDR survey where a number of questions regarding the respondents' visa status at their point of entry to the U.S were asked. After my recoding, the composition of the sample changed to the following, although it still compared fairly well with the target population:

Natives: 2,563 (81.13%);

Immigrants: 596 (18.87%) with Chinese 213 (35.74%), Indian 77 (12.92%), Korean 43 (7.22%), and Taiwanese 38 (6.38%).

Appendix II.2

An exploratory factor analysis of the most common job search methods used

This section describes the most common combinations of job search methods used by the survey respondents. In order to identify the most common combinations of job search methods I conducted an exploratory factor analysis to reduce the number of variables using both principal components analysis (PCA) and principal axis factoring (PAF) with orthogonal and oblique rotations. As expected, PCA and PAF produced different results due to their different assumptions. While PCA attempts to simply reduce the number of variables by creating linear combinations without any assumption regarding latent constructs, PAF tries to understand the latent structure of a set of variables that account for relationships among observed variables (Conway & Huffcutt, 2003). Accordingly, PCA did not partition unique variance (factors that influence only one observed variable) from shared variance (factors that influence more than one observed variables) and set the level of shared variance or communalities for the items at 1. In contrast, PAF estimated the level of shared variance for the items, which ranged from .13 to .49 – all much smaller than 1. Due to their different goals, item loadings and eigenvalues were higher for PCA with both orthogonal and oblique rotations. For this analysis I used PCA with oblique rotation because the purpose of the exploratory factor analysis was to reduce the number of job search methods used by respondents without interpreting the resulting variables in terms of latent constructs.

I present the results of my factor analyses along with the descriptive statistics in Tables II.2a and II.2b. As shown in Table II.2b, respondents in my sample utilized three methods of job search – non-relational (electronic postings, newspaper, professional journals), formal relational (market recruiters, career office, direct contacts) and informal relational (faculty, friends,

professional meetings) methods.

Insert Tables II.2a and II.2b here

My motivation to reduce the number of job search methods used by respondents was partly driven by Obukhova & Lan's (2013) recent study. In their study on job search strategies of young graduates, the authors grouped thirteen job search methods into four categories: contacts (school friends, non-school friends, family members, faculty), university intermediaries (career office, college alumni network), job opportunities found through internships and other formal methods (advertisements, campus recruiter, direct contact with company, employment agency etc). In my sample, however, there was no variation in the usage of informal relational job search methods between natives and immigrants when the three informal job search strategies (faculty, friends, professional meetings) were grouped together. Given that the use and effectiveness of informal friends and faculty for job search were the key variables of interest for this study, in the final analyses I presented results from ungrouped informal relational methods such as friends and faculty.

Table II.2a: Means & correlations among job search methods

		Mean	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	Faculty	.67									
2	Market recruiters	.13	-.01								
3	Career office	.20	.09*	.20*							
4	Professional meetings	.45	.28*	.03	.11*						
5	Electronic postings	.56	.11*	.17*	.17*	.23*					
6	Newspapers	.19	-.04*	.21*	.14*	.03	.30*				
7	Professional journals	.49	.20*	.09*	.09*	.29*	.44*	.23*			
8	Informal friends	.70	.21*	.07*	.07*	.21*	.08*	.07*	.09*		
9	Direct company contacts	.37	-.03	.18*	.14*	.08*	.06*	.12*	.06*	.14*	
10	Other	.05	-.25*	-.06*	-.10*	-.17*	-.22*	-.09*	-.18*	-.26*	-.11*

*significant at $p<.05$

Table II.2b: Principal components analysis of job search methods (N=2,758)

Rotation method		**Principal Components**	
		Orthogonal (Varimax)	**Oblique* (Direct Oblimin)**
Total variance accounted for after rotation		48.86%	
Item loadings			
Factor 1: Non-relational methods	Electronic postings	.78	.77
	Professional journals	.74	.74
	Newspapers	.56	.55
Factor 2: Formal relational methods	Direct contacts with company	.68	.69
	Market recruiters	.65	.64
	Career office	.51	.50
Factor 3: Informal relational methods	Faculty	.70	.71
	Informal friends	.64	.64
	Professional meetings	.58	.57
Eigenvalues			
Factor 1		2.33	2.33
Factor 2		1.39	1.39
Factor 3		1.16	1.16

*SPSS output from the pattern matrix is shown here. The output from the structure matrix was almost identical, although the component loadings were slightly bigger and 'newspapers' cross-loaded into factor 2 for principal component analysis with a loading of 0.44.

Appendix II.3

Construction of a degree field cross-walk across SED, SDR and NRC

The taxonomy of PhD fields of study represented a special challenge to this project because of the wide variation in the classification of disciplinary fields across U.S. federal agencies such as the National Center for Education Statistics' (NCES), National Science Foundation (NSF) and NRC. I started with the 2000 SDR-SED crosswalk of degree fields provided by the NSF. Subsequently the SED categories were assigned to NRC categories based on a disciplinary crosswalk that I developed. The list of PhD fields of study for the full sample is presented in Table 2.1. However, the decision to adjudicate degree field coding across SED & SDR using NRC specifications caused a number of problems.

First, for new fields in biological sciences, there was no one-on-one correspondence between SED taxonomy and NRC classification. I assigned these new fields into NRC categories after researching the definition of these fields on the internet. In order to verify how well my coding of degree fields corresponded to NRC measures, I then correlated my measures of the size of degree fields by programs with NRC coding. Given that the NRC provided information on program size, or the number of PhDs produced by respective programs, in five-year[6] counts, I calculated the size of the PhD program for respective institutions over three 5 fiscal year periods: July 1982-June 1987, July 1987-June 1992 and July 1992-June 1997. The correlation among the NRC measure and my measures for the FY 1983-1987, FY 1988-1992 and

[6] While the 1993 NRC report calculated the percentage of PhDs awarded to natives and immigrants by respective programs over a period of 6 years, it computed the size of the program over a period of 5 years.

FY 1993-1997 were the following: 0.82, 0.92 & 0.88. As expected, the correlation between my measures and NRC calculation was highest for FY88-92 than for any other years. This might partly be driven by the fact that the NRC measures were constructed from the information reported by university administrators, whereas I constructed the measures from the information directly reported by the respondents.

Second, a substantial number of programs in my sample (692 cases or 25.09% of 2,758 observations) did not have any ranking scores because either those degree fields were outside the scope of the NRC ranking or programs in those institutions were excluded from the NRC target population. Let us consider these in more detail.

Unranked fields of study: Some disciplinary fields such as agricultural & food sciences, medical sciences, and other health sciences, as shown in Table 2.1 with asterisks, were not rated by the NRC. These fields constituted 15.95% of the sample. If I were to drop the unranked fields, I would have substantially reduced the analysis sample. Therefore, I imputed ranking scores by computing averages for most unranked fields using closely related NRC designated programs. For instance, I took an average of the ranking scores in (i) biochemistry and molecular biology, (ii) cell and developmental biology, (iii) ecology, evolution and behavior, (iv) geosciences, v) chemistry and vi) biomedical engineering to compute an average ranking of agricultural & related sciences. The averages were then weighted using the number of PhDs in the subprograms. For this sample I was able to calculate scores of all unranked fields. After my recoding of unranked fields the missing values reduced to 11 cases.

Unranked programs in a field: A substantial percentage of programs in doctoral-

granting institutions (252 cases or 9.14% of the sample) were not rated by the NRC, although these degree fields were covered by the ranking. If I were to assume that all descent programs were ranked by the NRC, these cases could be excluded from the analysis sample. I, however, decided to keep these cases by adding 1 to all NRC ranking scores and assigning 0 to all unranked programs. After adjudicating degree field coding across SED and SDR using NRC specifications and merging it with program characteristics from the NRC reports, I constructed two analysis samples – one with NRC ranking scores only (including unranked programs in a field with an assigned score of zero but excluding unranked fields of study) and another one with NRC ranking scores as well as the imputed scores of unranked fields.

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CHAPTER 3

ETHNIC DIVISIONS AMONG FOUNDERS: SOCIAL EMBEDDEDNESS, RESOURCE ACQUISITION AND VENTURE EVOLUTION

Introduction and Research Questions

The literature on new venture creation focuses on the way in which founders' education (Ding, 2011), knowledge and prior work experiences (Beckman & Burton, 2008; Boeker & Wiltbank, 2005) shape initial organizational strategy, and structure by conditioning shared individual cognitions and world view (Baron, Hannan & Burton, 2001; Ensley & Pearce, 2001). Research in this tradition has typically emphasized the importance of founders' skills, mental models, and culturally appropriate templates for organizing a firm that exert an enduring influence on the subsequent evolution of the firm. It has almost completely ignored, however, differences in founders' 'embeddedness' (Granovetter, 1985; Uzzi, 1996) within different ethnic communities which may exert at least as much influence as their skills and mental models on the development of organizational strategy. This neglect is particularly striking in light of a long-standing line of social psychological research indicating that social similarity along ethnicity, language or cultural background (Vissa, 2011; McPherson, Smith-Lovin & Cook, 2001) and group memberships (Turner, 1999; Tajfel, 1982; Ruef, Aldrich, & Carter, 2003), often shape entrepreneurs' beliefs regarding "appropriate" ways of conducting business with important consequences for their ventures (Ruef, 2010; Webb, Tihanyi, Ireland, & Sirmon, 2009).

Ethnic entrepreneurship literature probably comes closest to exploring the links between differences in cultural (and material) resource endowments, ethnic group membership and small business ownership (see Light, 2005; Aldrich & Waldinger, 1990 for reviews). More specifically, it focuses on how resource pooling arrangements among ethnic group members based on shared language, culture, and homogenous ties lead particular ethnic groups toward small-business activities (Portes & Shafer, 2007; Evans, 1989). Thus, scholars have identified cases of Gujarati hotel owners in the United States (Kalnins & Chung, 2006), East African Indians in the retail pharmacy sector in Great Britain (Hassell, Noyce, & Jesson, 1998), as well as Chinese and Cubans in garment manufacturing in the United States (Bailey & Waldinger, 1991; Portes & Bach, 1985). One reading of this literature is that under certain conditions and among particular ethnic groups, entrepreneurship becomes taken for granted as an accepted career path, whereas in other places – even ones with relevant material resources, it does not (Tolbert, David, and Sine, 2011).

Nonetheless, the origin of differences in early stage organizational strategies and employment practices among ethnic firms remains poorly developed in this body of work. Much of this literature has been developed in the context of ethnic entrepreneurs in low-skilled industries; thus, its applicability to high-skilled ethnic firms is unclear. It also fails to examine variation in entrepreneurial activities at a subgroup level within a national origin group. This may be a significant omission because a few recent studies suggest that despite sharing common homelands, ethnic groups might diverge in their pattern of entrepreneurial activities in the host country due to differences in their social norms, religious beliefs, and historical experiences

(e.g., Frederking, 2002; 2004).

This paper seeks to examine the origin of initial business and human resource strategies in entrepreneurial firms as well as subsequent adaptation of these firms over time. I take an inductive approach, using a longitudinal study of thirteen Indian immigrant-owned IT service firms in the U.S. Although sharing a common national homeland and identity, the founders of these ventures were characterized by a high level of regionally and linguistically-based ethnic diversity. Field methods are advantageous in this type of study because they provide rich data for understanding the mechanisms through which such diversity produce differences in early organizational strategies and subsequent evolution of the firm. The findings suggest that differences in founders' embeddedness in different ethnic communities and the way the corresponding social structures as well as ethnic identities were maintained provided normative justification for (or lack thereof) the acquisition of key material resources through social ties in the home country and shaped initial organizational strategies and practices.

The findings also illustrate that under certain conditions initial business and human resource strategies might not necessarily impede organizational adaptation to changing environment over time. I highlight how debates on regulatory reforms in the broader society could ignite attention to 'unethical/illegal' business practices of firms at the local level and therefore, compel founders to try to diversify their firms. I find that irrespective of their initial business strategies those founders who could develop a particular set of practices were able to diversify their firms.

My study complements the growing body of research that highlights the role of

founders' background and agency in our understanding of the new venture creation process (Ding, 2011; Burton & Beckman, 2007; Ensley, Pearson & Amason, 2002). It demonstrates how founders' notions of 'appropriate' business practices are shaped, renewed, and extended through their embeddedness in different social structures and therefore, influence early strategic choices of new ventures. A core theoretical contribution of my study is to identify and theorize more fully the interplay among the ethnic communities, shared notions of resource acquisition, debates about unethical firm practices in the broader society and evolution of business strategies of new ventures.

The first section of this paper describes the research design and the empirical context of the study. The second section draws on the data to develop a process framework outlining how founders' beliefs about business practices are shaped and renewed through their community connections and affect early-stage strategies of ventures. The third section outlines the conditions under which young firms can break away from their paths by switching to a new regime of practices and develop into more sustainable forms in the face of changing market and regulatory environments. The final section draws implications, points to limitations of the study and possible future research.

Methods

Data

I opted to examine the origin of differences in initial organizational strategies of new ventures in the context of Indian immigrant-owned IT service firms in New Jersey information technology industry for two reasons. First, the focus on firms in a

single region and sector of economic activity held constant key environmental conditions, as well as some of the institutional influences asserted to shape new firm foundings (Sine, Haverman, & Tolbert, 2005) and their subsequent evolution. Second, the New Jersey IT industry was characterized by high rates of firm founding among high-skilled Indian immigrants (Wadhwa, Saxenian, Rissing, & Gereffi, 2007). Although sharing a common national identity, these entrepreneurs were characterized by a high level of regionally and linguistically-based ethnic diversity. My focus on a single national origin group with ethnic diversity allowed to hold constant national context, but permitted me to examine the effect of variation in founders' embeddedness in different community structures at the subgroup level on early-stage organizational strategies and subsequent venture evolution.

Because there is at present no representative enumeration of Indian IT service firms in New Jersey, I selected informants from a set of individuals who had registered for business networking events organized by ethnic associations, such as the New Jersey Indus Entrepreneurs (TIE) and local Indian American Chambers of Commerce during October 2008 and May 2009. To begin with, I conducted interviews with a diverse sample of twenty-six Indian IT firm owners in New Jersey and noticed that they had predominantly originated from five major states in India corresponding closely to different ethnic (and linguistic) backgrounds.

Perhaps more importantly, my initial interviews revealed that although registered as computer programming services firms (all were in the industry categories SIC 7371 and 7379), most Indian IT firms primarily functioned as IT staffing agencies that brought temporary immigrant IT workers from abroad and supplied them to large

American firms. Also, there was enormous heterogeneity across the firms in terms of their strategies, employment practices, access to resources, and how they looked like (structure and form). This initial field study led me to formulate two research questions: "Why do new ventures vary in their early-stage strategies and employment practices? How do these differences in early strategic choices affect the growth and adaptation of firms over time?"

I set out to examine this question using a multiple-case research design that permitted comparisons and replications of relationships across cases, with each case serving to confirm or disconfirm inferences drawn from the others (Eisenhardt, 1989; Yin, 2003). Based on my initial field work, I sought to obtain representation of firms owned by entrepreneurs who had originated from five major states in India – Maharashtra, Delhi, Karnataka, Tamil Nadu and Andhra Pradesh. In the end, the sample contained more owners from Andhra Pradesh than those from other states because of their dominance in the IT staffing industry landscape (only two of the initial twenty-six IT firms were part of the final sample). All the firms in my sample were less than or equal to 10 years old at the start of my fieldwork in 2008. They were also heavily dependent on immigrant workers in early years and therefore, filed visa applications for their employees with the U.S. Department of Labor & Immigration Services (see the section on research setting below). The existence of such written records and my ability to access and refer to these records provided me with increased assurance that case narratives about the earliest days of the organization would be less subject to retrospective biases. Also, the majority of the firms in my sample (ten of the thirteen) started the diversification process between late 2007 and early 2009.

Hence I could observe in real time how early-stage organizational strategies affected the subsequent evolution of ventures in the face of the market and regulatory downturn.

Table 3.1 describes the thirteen companies studied for this paper. The median age of the firms in my sample was 6.5 years, the median revenue in 2008 was $9.5 million, and the median number of employees in the same year was 50. The entrepreneurs ranged from a single owner to husband-wife teams to teams of unrelated owners. They also differed in terms of their educational background, work experiences and sub-national ethnicities. Studying this diverse set of firms offered firmer ground for developing theory than studying a more homogenous one.

-- Insert Table 3.1 here –

Research Setting

The rise of Indian immigrant-owned IT staffing firms in New Jersey IT Industry can be understood as the unintended consequence of the combination of two key factors: the policies adopted by the Indian state since the 1950s designed to increase a scientifically trained labor force, and the rising demands for IT workers in most western countries, particularly in the US in the early 1990s. The latter prompted the US government to liberalize its visa regime for the temporary entry of skilled workers. This historic coincidence played a pivotal role in the emergence of Indian immigrant-owned IT staffing firms in New Jersey.

Historically, the Indian state undertook a science and technology-oriented development program aimed at building a “scientifically trained” workforce. This program led to a remarkable increase in India’s science and technology manpower

from 188,000 in 1950 to 732,000 in 1965 to 6.3 million in 1996 (Jain & Kharbanda, 1999). Deregulation initiatives in the 1980s enabled Indian IT firms to take advantage of Indian scientists and engineers for the first time and tap into the emerging global demand for software services (Athreye, 2005). The growth of the software industry in India was primarily concentrated in the capital city of Delhi; the western Indian state of Maharashtra; and the three south Indian states of Karnataka, Andhra Pradesh and Tamil Nadu due to their better telecommunication networks and tertiary education and research infrastructure. However, as the result of business foundings, Karnataka and Tamil Nadu produced the most IT jobs, while Andhra Pradesh emerged as the most prominent supplier of 'IT people' on the global scene (Xiang, 2007). This is because, beginning in the early 1990s, the government of Andhra Pradesh promoted the IT industry as the engine of economic growth. By the mid-1990s, a massive number of private engineering colleges and private IT training institutes had sprung up in the state (Statistical Abstract of India, 2000) with an explicit goal of training IT workers. Encouraged by the simultaneous opening of US IT labor market and the growth of domestic IT industry, rural middle classes in Andhra Pradesh diverted their resources from agriculture and invested them heavily into higher education, especially in the IT training and education of young male household members (Xiang, 2007; Statistical Abstract of India, 2002). However, the state's share in the number of IT jobs created during this period remained small (Handbook of Statistics on the Indian economy, 1999-2000). Accordingly, a sizeable portion of these newly trained IT workers from this state were available for recruitment to the West, where the cost-quality advantage of Indian software programmers became increasingly well-known. This was

particularly true for the U.S. where the demand and fierce competition for IT workers led the government to facilitate the temporary entry of skilled workers through the H-1B visa reform in the 1990s.

The H1-B visa program was originally designed to enable U.S. firms to hire skilled foreign workers for "specialty occupations", those requiring theoretical and practical application of a body of highly specialized knowledge and at least a bachelor's degree. H-1B visa holders are allowed to stay in the United States for up to six years and can apply for permanent residency or a green card provided employers submit a petition on behalf of the worker. Since the late 1990s the H-1B visa program had been used primarily to meet demands for workers in computer-related occupations (Hira, 2010; Lowell, 2000). Skilled immigrants from Asian countries, particularly from India, constituted the largest single group of H-1B visa recipients. Thus, the share of Indian H-1B recipients increased from a low 9% in 1989 to a high 57% in 1999, remaining at nearly half of all H-1Bs in 2009 (Kerr & Lincoln, 2010).

The dominance of Indian software engineers in the H-1B pool coincided with American industry's drive toward the outsourcing of human resource management tasks to a limited number of 'preferred suppliers or vendors' (Xiang, 2001). Generally speaking, preferred suppliers or vendors are large temporary staffing agencies through whom end users such as large U.S. firms select temporary workers to meet their short-term staffing needs. Beginning in the late 1980s, the IT industry witnessed a reduction in the number of preferred vendors as client firms became increasingly strict about their suppliers' financial standards and training infrastructure. This resulted in a greater integration between big staffing agencies and big clients because only big

placement agents could meet the exacting standard of large client firms. However, large staffing agencies faced two problems in fulfilling their clients' growing demand for IT workers. First, it was difficult for them to judge the quality of foreign IT professionals. Second, clients wanted to be able to obtain workers quickly when they needed them but the agency could not sponsor an IT worker from overseas until a job offer was finalized. The entire process for sponsoring an H-1B visa took 6 months to 1 year, while a typical IT project only lasted around 6 months. Thus a critical time lag between demand and supply existed. Hence the large staffing agencies increasingly relied on smaller Indian immigrant-owned temporary staffing firms or 'body shops' to provide good quality reliable workers from overseas (Xiang, 2001; 2007).

My initial fieldwork in New Jersey suggested that a sizeable portion of Indian H-1B workers recognized this as an entrepreneurial opportunity and went on to found their own IT staffing firms or body shops. The Indian staffing firms did not all operate with the same business model, however. Founders' reference group norms and shared beliefs about accessing IT workers through ethnic ties in India led to two different initial business strategies of these firms. In one business strategy, owners attempted to secure direct clients in the U.S. and developed close ties with those clients to secure job orders ('client-shop'); in the second, they operated as subcontractors of other temporary staffing agencies, relying on an existing stock of employees to secure job orders ('body-shop'). New ventures with links to IT workers in Andhra Pradesh (almost all top management team members of whom came from a particular group, Telugu, with its own distinctive language and culture) were much more likely to pursue the body-shop strategy, with very different consequences for the

subsequent diversification initiatives and evolution of these organizations.

Data Sources

In order to explore both the sources and the outcomes of these differences, I used three main sources of data: open-ended interviews, archival documents and (non-participant) observations (refer to Table 3.2).

Interviews. During 2008-09 and the summer of 2011, I collected sixty-eight one-to three-hour semi-structured interviews with founders and senior managers of these firms as well as clients, industry experts, and other informants. Eleven of these interviews were follow-on face-to-face interviews. For each firm, I sought to interview founders and senior managers with long tenure and 'front-line' day-to-day experiences of running the operations of the firm, with a desire to maximize the diversity of informants along job-related characteristics. The semi-structured interviews were developed prior to data collection, focusing on respondents' regional and ethnic background, home country connections, career histories, organizational strategies, and human resource practices of staffing firms. Over time, I adjusted the interview protocol to refine the kind of information collected. In all cases I made extensive use of archival data (see below) to prepare for the interviews and challenge interviewees' memories. I was careful not to lead the informant in his or her responses to avoid giving any implicit request for confirmation (Miles & Huberman, 1994). All interviews, except one, were conducted in English, recorded, transcribed, and entered into a case study database.

-- Insert Table 3.2 here --

Observations. I attended monthly meetings organized by ethnic business

associations as well as three political/cultural association events organized by local Telugu community. I wrote extensive notes regarding the activities of association participants after the meetings.

I also did non-participant observation in one firm for five months from March to July 2009, which allowed me to understand the day-to-day operations of an IT staffing agency. This was a midsize firm that was founded in 1998 but had very little activity in the initial years. With a corporate office in New Jersey, this agency had grown rapidly during the 2004-2008 period, and had annual revenues of $34 million when I began my field research. Here, I had encounters with some former and current employees of the company. The firm owner granted me complete access to all internal memos, H-1B filing records of all its workers, payroll slips, and correspondence with the officials from the immigration services. I also stayed some of the nights in the company guest houses where I had numerous informal conversations with immigrant workers who were either waiting to be placed for their first projects or in-between projects and looking for the next placement.

Archives. To add robustness to the data, I collected public documents including company incorporation records from the New Jersey Internal Revenue office, H-1B visa records under the Freedom of Information Act, press releases, newspaper reports, on-line ethnic news stories (e.g., TeluguPeople.com) and industry articles about the companies included in my sample. These documents offered a way to cross-check the interviews as well as compile a full picture of community-based IT staffing business in the state.

Data Analysis

I organized the data analysis into three stages. First, I grouped the interview transcripts by firms (cases) and read through them to acquire a broad overview of informants' perspectives. In line with the principles of grounded theory (Strauss & Corbin, 1990; Miles & Huberman, 1994; Urquhart, 2013), I then examined each transcript line by line for phrases that referred to the ethnic background, career histories, local community ties, and home country connections of informants as well as business and employment practices of ventures including sales and marketing, day-to-day operations, recruitment, training, placement, and compensation. I wrote theoretical memos to link recurring themes from the data with a-priori understandings of the sources of variation in early-stage venture strategies derived from existing literature. I also cross-referenced and noted down any contradictions between informants. As themes emerged, I made comparisons between data and codes as well as codes and categories to refine and develop a set of first order (axial) codes (Strauss & Corbin, 1990). Next I drew conceptual diagrams and process flowcharts (Langley, 1999; Miles & Huberman, 1994) to identify the theoretical constructs, relationships, and longitudinal patterns within each case and wrote chronological case histories for each case.

I analyzed the initial nine cases independently before turning to cross-case analyses (Eisenhardt, 1989) to compare pairs of cases to identify consistent patterns and themes. I looked purposively for counter-evidence by adding four additional cases to the sample (Yin, 2003). When such counter-evidence was found, I revised the coding scheme and recoded interview transcripts to refine the initial framework. I

then grouped focal firms by themes of potential interest to develop robust theoretical constructs and causal relations. The final coding scheme emerged from several iterations of coding, construct redefinition, and recoding.

To avoid confirmatory biases, I then hired an independent coder who was completely unfamiliar with the original coding and purpose of the study to cross-check my coding efforts for each case and test the comparative cross-case analysis. We then compared data coding, construct assignments, and pattern matches to refine our shared understanding of the narratives. Most of the data were coded and analyzed using Atlas-ti, which was specifically designed for building theory from qualitative data.

At the second stage of analysis, I examined broader regulatory debates regarding visa reform in the U.S. and actual patterns of IT staffing business in New Jersey, paying close attention to the profiles of companies involved in my sample. I utilized archival data to reconstruct a map of IT staffing that identified the home country ties and local connections of informants as well as quantified flows of H-1B workers in the state. Finally, I revisited field notes to contextualize my findings while developing a robust understanding of the issue under investigation.

Results

An Overview of the Framework

Although the framework was developed *ex post* from the data, it is useful to provide a brief overview of its major components, before I discuss it in detail. The first part of the framework is illustrated in Figure 3.1. The firms in my study can be classified as pursuing one of two distinct strategies. In one, they attempted to secure long-term clients – either end users of IT workers in government agencies and midsize

firms or preferred vendors who would place IT workers with end users ('client-shop'). In the other, firms primarily placed workers through other co-ethnic firms – often those pursuing a client-shop strategy. I refer to this as a 'body-shop' strategy. Firms with a body-shop strategy often relied heavily on immigrant workers themselves to locate and secure their own placement. One recruitment manager of a client-shop firm succinctly described differences between the two business models: "Our business is different. We have clients and then we look for candidates [workers]. Their business is they have candidates [workers] and then they look for clients."

The first strategy reflected higher dependence on clients, while the second strategy involved greater reliance on immigrant IT workers and required a high level of control over these workers. Interestingly, founders with cultural ties to Andhra Pradesh were much more likely to pursue a body-shop strategy. Thus, all, except one, founders of body-shop firms in my sample came from a particular ethnic group, Telugu, with its own distinctive language and culture. Overall the ethno-linguistic origin of founders (e.g., Telugu versus non-Telugu) and their connections with local ethnic and cultural associations in New Jersey served as a good proxy for accessing IT workers in Andhra Pradesh through social ties, making Telugu-owned firms more likely to utilize a body-shop strategy.

-- Insert Figure 3.1 here –

Initial business strategies: Client-shop versus body-shop

Table 3.3 displays the key facets of the HR arrangements characteristic of the client-shop and body-shop strategies for IT staffing firms. I discuss each of these in detail next.

-- Insert Table 3.3 here --

Client-shop

The development of a client base was relatively difficult for new ethnic IT staffing firms. Firms pursuing a client-shop strategy used two approaches to develop client relationships: (i) investing significant resources in sales and marketing to develop relationships with firms in the private sector; and (ii) certifying themselves as minority/women-owned businesses in order to build client-vendor relationships with government organizations.

In most cases founders of Indian staffing firms developed these client relationships by leveraging their former connections to U.S. firms and individuals, although they sometimes supplemented their efforts with a few sales agents. As the owner of Client-shopC explained:

"For business development purposes, we are using couple of guys who give us the leads [potential job orders from clients]. In Texas I have a guy like that. In California I have some contacts who do this for me. They are ambassadors. They are not on my payroll. But whenever they give me a lead, I compensate them. So I keep my fixed payroll at the lowest level. And when these guys kick in some business, from there I can give a percentage."

Client-shopB, the only female-owned firm I studied, is a rare example where the owner relied almost entirely on an in-house sales and marketing team to generate business from customers. The founder arrived in the U.S. in the late 1990s as a senior recruiter of an American staffing firm and later decided to start her own staffing firm once the company changed hands. Lacking a background in sales and marketing she hired a sales person early on to generate business.

Client-shopG, another sample firm, is an example where the founding team attempted to build client relationships with large publicly-listed companies without

routing the business through the preferred vendors. One of the owners described the process of acquiring an end client such as A&T, or Citigroup, and associated challenges:

"It takes a long time to become an IT vendor of big companies. Usually you register with all the firms, wait for a RFP (request for proposal) to come, and when it comes, you compete with thirty other vendors, and if you are in the right position, you will get it. For the RFP, there is a thing about the public companies that I don't like. They don't ever tell you when the RFP will come out, when they will hire new vendors, nothing. This staffing business is all backdoor business. Most of them don't even have an RFP for five years, as they are happy with their vendor list."

However, Client-shopG had little success in generating direct businesses from the Fortune 500 companies and gradually shifted much of their sales effort toward winning businesses from the state and federal governments. Indeed, generating job orders from government organizations became a common strategy for Indian staffing firms during the recession years of 2008-2009.

As some of the previous quotes suggest, most of these staffing firms found it extremely difficult to build direct relationships with companies in the private sector, difficulties that only intensified during the economic slowdown after 2008. To deal with the uncertainty, some staffing firms recast themselves as the certified minority/women-owned provider of IT professional services for government organizations. Client-shopA provides a classic example of how most firms went about generating businesses from government organizations. The firm, owned by a married couple, began as a generic IT staffing agency without a well-defined service niche or customer set in 2002. In the wake of economic downturn in 2008, Client-shopA decided to certify itself as a woman/minority-owned small business to bid for government IT contracts. As the founder explained:

"If you use a certification of minority-owned business, or woman-owned business…, that definitely can become a door-opener. Will not give you business, but will at least open doors for you. Lot of companies—uh, have internal policy to give a percentage of the business directly or indirectly to minority-owned businesses, or women-owned businesses. So, if you go to them, they might say, "Ok, I'm willing to look at you because you are certified." So that's how the door-opener is. Alternatively they might tell you to go to one of their suppliers, who is mandated to give, let's say 10% of the business to a woman or minority-owned business."

Some firms were more innovative. Client-shopE is an excellent example. The current owner joined the firm as a minor partner but later acquired it when the company filed for bankruptcy in 2003. As part of its broader business development strategy, Client-shopE, a generic IT staffing firm, created a training division and became affiliated with the New Jersey state government. When I visited the firm in 2009, I saw numerous awards from the government and professional bodies displayed in the reception area. The director of training division explained that the firm had become a certified provider of IT training services to New Jersey, training unemployed high-skilled American workers in software development and project management. This work made the firm visible among state bureaucrats and helped them to win government IT projects.

The business strategy of client-shop firms had a number of implications for their employment models including strategies for recruitment, training, placement and compensation.

For recruiting, most firms with a client-shop strategy only sponsored relatively experienced immigrant workers from India based on job offers from clients and relied on the help of their marketing and recruitment offices in India. The recruitment director of Client-shopD explained:

"Our India office helps the professional services [IT staffing] group, like when we apply our new H-1Bs, they kind of do a campaign there, like you know, career fair, and all kind of things to identify the quality resources, so we could bring them here."

However, given that sponsoring and recruiting workers from abroad took from six months to one year, they also hired native workers directly from the local market, as well as sourced immigrant workers from body-shops under the 'corporation-to-corporation' agreement.

Second, in terms of training, almost no staffing firms with a client-shop strategy in my subsample invested in the skill development of its immigrant workers. Although they did not provide direct training, many encouraged workers to get additional training. For instance, Client-shopD suggested workers to 'go and get trained externally' and reimbursed them for those training expenses on a case by case. Client-shopC did not offer any training to its workers but tried to place them on projects where they had the opportunity to enhance their skills. Client-shopE is an exception in this regard. It started its IT training division for two reasons - to reduce the attrition of current workers who often changed employers to get experience in a new technology, and to train its new arrivals from India.

Third, for marketing and placement, all the firms I profiled in this subgroup had reasonably good relationships with their clients, and typically tried to find the next placement for their workers before the current project came to an end. The only exception in this context was Client-shopA that encouraged workers to find their own placement.

Finally, in terms of pay, most firms employed their workers on a salary and provided a range of benefits including health insurance, pension, and short-term and

long-term disability and life insurance. Again Client-shopA represents an important exception; it did not employ its immigrant workers on a salary. Rather it paid them 75% of their hourly billing rate on an average and workers typically bore all the costs of their health insurance, vacation time etc.

All of these firms faced a lot of challenges in retaining their immigrant workers. To reduce attrition, they encouraged their employees, especially the experienced ones they hired from overseas, to file for green cards. Because the green card application was not transferable to another employer, once filed, it effectively locked the worker to the firm for an average of three to six years. Body-shops also followed a similar strategy to retain workers. One marketing manager of Body-shopP noted:

"The advantage of working with a Desi [Indian] employer, till workers get their Green Card is, if you join an American company, and there is no job tomorrow, they'll just roll back everything. They'll just give you 15 days' notice to look for another H1B, and they stop this Green Card process right there. It's not transferable, also. You'll have to go to a new employer and start the process again. Rather, if you stick to a Desi employer, and, even if you lose your job, you can pay for taxes and continue your Green Card process. We'll maintain your status. We'll never, ever revoke anything. So you will save a lot of time. Now, once you have your Green Card, you are a free bird. So people [workers] want to stick to a Desi employer until they get their Green Card."

Despite this similarity the initial business strategies and employment models of body-shop firms were quite different from those of client-shop firms.

Body-shop

Body-shops had no relationships with end clients and primarily placed workers through co-ethnic client-shop firms that had direct relationships with end clients and preferred vendors, or through large American staffing firms. Since co-ethnic firms

constituted their primary client base, I refer to this business strategy as the 'ethnic enclave strategy'[7] following Portes & Bach's (1985) reasoning. Some large body-shop firms also had limited relationships with preferred vendors. However, most firms were limited to simply taking job listings from client-shop firm and/or preferred vendors in a scattershot approach. In the absence of any investment in sales and marketing, they also relied on Indian immigrant workers to develop client relationships themselves, by locating jobs online and then applying for them. Once workers were selected for interviews and jobs, the firms handled the visa documentation and other paperwork needed for client firms to use the workers. As one marketing manager of Body-shopP noted:

"Initially it was very tough to develop vendor relationships. But when we had our own employees, it became easy. They'll be looking at the job sites and apply for jobs, but at one point of time that customer has to talk to the employer to build a relation. "Oh, your guy got selected. I need to send you the paperwork." So obviously, they will contact me. So I will be the point of contact over here. And once we have this master's service agreement in place, between companies, then we are authorized to work with them. And the company will add my email address to their distribution list. They'll start sending the new requirements."

The business strategy of body-shop firms had a number of implications for their employment models. Let us first consider recruitment. Body-shop firms used a 'bench model', that is, they sponsored experienced workers from overseas without any job offer from clients and put workers 'on the bench' after their arrival until a suitable job vacancy for the worker materialized. They also recruited inexperienced foreign graduate students locally as trainees. They arranged accommodation for these workers in company guest houses, trained them, and only processed the latter group's

[7] Ethnic enclaves, or the spatial concentration of immigrant businesses in distinct neighborhoods, typically serve co-ethnic customers and employ a large number of co-ethnic workers.

temporary work visas or H-1Bs when they managed to get placement at client sites. The bench model was succinctly described by an IT worker who arrived in 2000:

"They picked me up at the airport in their company car and placed me in a nice accommodation. There were three other guys like me staying in that guesthouse. I was under the impression if there was any vacancy I would be placed there. When they told me that I need to find a job or I may be sent back [to India], I started asking my colleagues and friends. They told me not to worry: this is the norm! They did not tell me all these things in India. Even if they told me this, it is doubtful how much I would understand of these issues. You also would not understand the concept of benching. The whole thing was a big shock."

Being the employer of record for immigrant workers also enabled body-shop firms to exercise short-term control over these workers. Like client-shop firms, they filed for green cards for their experienced workers they hired from overseas. However, they used their role as the employer of record somewhat differently to control the student workers. They tended to overstate the experience of student workers in their resumes to place them in jobs. While this strategy helped student workers to secure temporary placements, these workers often failed to transition from those temporary jobs to permanent positions when offered by their employers because they had falsified their resumes at the time of hiring. The marketing manager of Body-shopQ explained how the process worked in favor of these firms:

"Most of the people [student workers] they fake, actually. If you stick to one or two years of experience and genuinely send his resume outside, nobody is going to call him for an interview. So first you have to attract their eyes, huh? Ultimately, even with one year of genuine experience, you'll be able to deliver what they are expecting. Only if the client company wants to take you permanently onto their company's payroll, then their HR people will see when you graduated, because they need to sponsor your visa and all. But you will be scared to give them, because you faked at the time of hiring. So most of the time, even if they're offered a permanent job, these consultants [workers] won't go and join them. They will be with us."

Second, in terms of training, all the firms with a body-shop strategy invested in the initial skill development of its immigrant employees. Most of them ran a training

center that provided workers with special skills and the updated technical knowledge required in the country's high-tech industries. Many senior employees of these firms taught courses in those centers, providing opportunities for the workers to keep up with the rapidly changing skill requirements and employment needs in the industry.

For marketing and placement, body-shop firms relied heavily on immigrant workers to locate and secure their own placement through on-line searches and job applications, as mentioned before. Upon a project's completion, they typically "benched" the workers to await the next placement. Under these arrangements workers bore all the costs of their 'bench time' if they could not find any suitable job.

Finally, because firms with a body-shop strategy served as subcontractors for other vendors and placed workers through another layer of companies, workers had to pay the intermediaries' commission twice, and thus took home a much lower percentage of their earnings. One industry observer noted the earnings penalty incurred by immigrant workers:

"The large companies, for example, like Citibank and Bank of America, give all the big projects to the big companies. So if the Bank of America is paying 100 dollars, the actual employee will only get like 50 dollars. Because IBM has to take money as the primary vendor, and there is another second layer, and maybe even a third layer."

In fact, all body-shop firms rewarded their workers depending on the individual worker's role in the placement process. Typically workers took home a higher percentage of their earnings if they managed to find their own projects. The owner of Body-shopR offered an overview of the process:

"Most consultants [workers] find projects on their own. If you find it on your own, you get 80% of the billing. If we find projects for them, we pay them 70%. And we give 5% to the marketing guys. Consultants [workers] lack perks."

Overall, the relationships of body-shop firms with workers were very weak and primarily driven by money. Some of the large body-shop firms did not ever meet a significant minority of their immigrant workers. This was likely to arise in situations where the workers were already present in the U.S., and merely transferred their work visas from another employer after locating their own placement.

I find that the different business strategies reflected, in part, founders embeddedness in different communities or social structures (Telugu vs. Non-Telugu) in New Jersey and India corresponding closely to their ethno-linguistic identities. I discuss how non-Telugus distinguished their pursuit from Telugu-owned body-shops, while Telugus maintained and renewed practices of body-shopping business in detail next. Specifically, I highlight three mechanisms: (i) narratives to distinguish spheres of business activity, (ii) ethnic cultural associations to insulate and preserve body-shopping business pursuits, and (iii) social ties to Andra Pradesh, India, to access resources on an on-going basis to renew and expand body-shopping endeavor.

Origin of Initial Business Strategies

Narrative distinctions to separate spheres of business activity

The business strategy of body-shops represented a divergence between economic practices and normative values among Indian immigrant entrepreneurs and workers in the New Jersey IT industry. It is important to note that although knowledge of Indian IT staffing firms were much more ill-defined among Indian community back home, the business practices of body-shops had become well-known in Indian immigrant community in America during the period of this study. The

condemnation of body-shops was widespread and appeared in my interviews as well as informal conversations with industry experts and most founders of client-shops. Founders of client-shops perceived themselves as operating within a sphere distinct from that of "illegal" and "unethical" practices of body-shops. A Telugu industry expert, who used to own a client-shop in the late 1990s, explained:

"Nobody ever used to do an H1 [H-1B] when I initially started unless we have a job [order]. But then we realized that there is demand, and once you have people then clients will just come and take [them]. Then we started building more and more inventory, so the people that built more inventory got more business, even though that's not right in a certain way."

Similarly, another non-Telugu IT entrepreneur commented:

"Until the candidate [worker] gets placed, the consulting [IT staffing] company will pay for their food, their boarding and all these expenses, and sometimes it may take four to five months, or six months, and they are investing a lot of money on these candidates [workers], and what happens is sometimes some of the candidates [workers] will run away after six months! See, a lot of companies are into these things, and this is not legal."

Owners of client-shops saw involvement in body-shopping business as a form of 'suicide' and 'derogatory'. Evidence of past misconduct relating to the mistreatment of workers and visa fraud, as reported in local newspapers, was usually invoked in those instances to illustrate what was wrong with the body-shopping business. For instance, one incident in which a local Telugu body-shop owner was arrested and indicted as part of a federal investigation into H-1B visa fraud was often cited as proof of an illegal business activity[8]. Almost all non-Telugu owners of client-shops I interviewed saw themselves as pursuing a lofty business activity which is quite distinct from that of practices and individuals engaged in body-shopping. As the non-

[8]For a description of the incident, refer to http://finance.yahoo.com/news/Tech-company-officials-apf-14341654.html or write to the author for a copy of the news story.

Telugu firm owner of Client-shopD commented:

"If you see our list of customers, they are all direct customers, you know. We don't go through any layers. When I started the company I was very clear that unless I have a situation where I know somebody and have a relationship, I won't necessarily go through a channel. Because we are not in the model where we are going and hiring 100 people from overseas and bring them in and then trying to Body-shop them out. We are working with the customer, what the customer needs, we actually recruit within the local market. So more than 50-60% of our recruiting, or 70% actually, recruiting is done in the United States."

In contrast to the views held by non-Telugu owners of client-shops, Telugu founders of body-shops either conveniently overlooked the distinction between the two types of business or downplayed the difference. It was clear that at the very least the discrepancy was not deemed important to them. Some owners and managers also voiced pride in running body-shops and emphasized that community members benefited from the body-shopping business. They often used such terms as "community connections", "community help", and "association business" to describe their business and employment practices. Of these first-order terms the notions of "connections" and "help" occurred most often:

"With my connections, actually, all my friends are over here, they are all settled down. Some I brought them to this company. They joined, their wives joined, and their brothers joined. So it's like 15, 20 people joined with my connections. So these are all helping, actually, to grow the business." (Telugu marketing manager of Body-shopP)

The marketing manager continued:
"It's a mutual [understanding], it's not one-sided. People want to stick to a Desi [Indian] employer until they get their Green Card.. So that is where we come into picture. So we are helping them, and we are getting help. So it's both ways."

A few body-shop owners also aspired to be perceived as software development firms and indicated the porosity between the two. As the owner of Body-shopT maintained:

"I'm one/two years away from where I want to be…..I want Body-shopT to become a solid enterprise. A company should have two-three lines of business. We currently do professional services [IT staffing]. We want to expand on SAP products, solutions, training and product development."

The porous boundary between client-shops and body-shops took the foreground in my interviews with Telugu founders of client-shops. Interestingly, while all non-Telugu owners of client-shops described body-shops as distinct business and were never involved in 'body-shopping', two of the three Telugu-owned client-shops[9] were heavily involved in pursuing a body-shop business model in their early years before changing gear. As the owner of Client-shopE justified:

"See, staffing is the easiest way to get in. And that it makes sense, for people to have a revenue stream, and then from there build on it. But we didn't want to get into staffing. We wanted to be branded different. So, you did your MBA, you worked for a multi-national company, you had forty-five guys reporting to you…And uh, doing staffing, is like, you're degrading yourself. Right? So we wanted to have that division because nobody gave me money. I had to earn my own money."

Overall, the narrative contrast between Telugu and non-Telugu client-shop owners strengthened the existence of two separate moral worlds. I would argue that these separate moral worlds could co-exist because Telugu and non-Telugu founders were embedded in different social structures both in home and abroad. Given that Telugu body-shop owners were not lauded in the business community of New Jersey, it was necessary for them to maintain and renew practices of body-shopping business through the community. I turn to this issue next.

Separation and maintenance of body-shopping business through ethnic associations

Despite the overall low cultural standing of body-shops among Indian

[9] The owners of Client-shop G, the remaining Telugu-owned client-shop in my sample had invested the sale proceeds of their prior IT staffing business into their new business.

immigrant community in America, there was an implicit agreement among New Jersey-based Telugu community regarding the economic utility of operating body-shops that benefitted both owners and IT workers. This was the outcome of the marked growth of regionally-oriented cultural associations in New Jersey (e.g., TeluguPeople, North American Telugu Society – New Jersey chapter, American Telugu Association – New Jersey chapter) since the late 1990s apart from ethnic business associations such as the New Jersey Indus Entrepreneurs (TIE). While ethnic associations such as TIE were keen to interact with the mainstream (local) business community, foster links with local government as well as government in India, and represent the entire Indian nation, regional cultural associations were organized along Indian states of origin or language groups and devoted to cultural, charitable and religious activities. As shown in Table 3.4, all Telugu founders in my study were key organizing members and/or active participating members of Telugu cultural associations. In contrast, the majority of non-Telugu founders were primarily involved in ethnic business association meetings. It is important to note that I met the only non-Telugu body-shop owner in my sample at a TIE (the ethnic business association) meeting, whereas I encountered all Telugu body-shop owners at regional cultural events.

-- Insert Table 3.4 here --

Most of the activities of Telugu cultural associations were conducted in Telugu and therefore, it was difficult for non-Telugus to participate in those events. Activities in these events revolved around the celebration of special events, religious festivity, fund-raising for charitable work in Andhra Pradesh and/or New Jersey, community

service as well as occasional free workshops on IT job fair and immigration. At the cultural events I attended Telugu body-shop owners often utilized their affiliations to co-ethnic associations as occasions for advertising their "IT consulting" business and sponsoring relatives or acquaintances of participating members from India. The overlapping religious, charitable and cultural involvement of Telugu body-shop owners in local Telugu associations not only elevated their social status but also appeared to win them genuine respect from community members. Thus, by actively engaging in and shaping the agenda of Telugu cultural associations, body-shop owners were not only effective in isolating and maintaining their business practices but also successful in countering the stigma often associated with their pursuits.

Furthermore, concerned by the need to protect as well as expand their own sphere of business, a select group of Telugu body-shop owners formed a small and medium enterprise consortium (SMEC) to promote their business. As the owner of Body-shopS elaborated:

"I'm one of the founding members of Small and Medium Enterprise Consortium. It's a platform for companies to fight for a common cause. In the U.S. we fight for immigration issues and in India we work on infrastructure issues."

Body-shop owners were particularly disappointed by stringent legislation regarding the company sponsorship of H-1B workers. The founder of Body-shopQ explained:

"You know, now the government is dealing with this business. So any business which requires [a] lot of compliance is tough. Compliance means government laws you need to follow, because you are getting somebody on H1-B, you need to provide him [with] everything that you promised. Kind of their expectations, it's hard. If you fulfill them, you cannot make money. Business, if you don't make money, then you need to close your shop."

Accordingly, Telugu body-shop owners took it on themselves to get them heard within

the wider business community in America via lobbying. Eventually they joined hands with already established lobbying groups such as TechServe Alliance, the national trade association representing the IT services industry, which advocates for boosting the flow of engineers and other skilled workers to the U.S. Although Telugu body-shop owners' concerns were partly self-serving, their key motivation was to protect their own sphere of activity through more formal channels.

Renewal and expansion of body-shopping business through resource acquisition

In addition to isolating and maintaining their business practices through ethnic associations, body-shop owners needed to have access to a regular supply of Indian IT workers from overseas in order to make their strategy work effectively. Given the strategic importance of Andhra Pradesh as the primary supplier of IT workers within India, Telugu-owned body-shops had a distinct advantage over non-Telugu firms in this context. In a vast country such as India, where considerable variance exists in linguistic and cultural practices, corresponding closely to ethnic divisions, Telugu-owned firms enjoyed considerable lead in recruiting local IT workers via ethnic ties and sponsoring them overseas. The Telugu founder of Client-shopE noted:

"We don't even want to grow that [IT staffing] side of business. But most of my guys had their Green Cards in process and they are *friends*, rather than employees. So we gotta keep it going for them. And we can get more friends, children, nephews, or all of them. All qualified candidates. They want to come through a known company. It's coming to us, why not take it?"

In contrast, the non-Telegu firm owner of Client-shopC explained:

"See, right from the beginning we have consciously avoided—even in the year 2000 when I started I didn't want the company to stay only as a staffing…Because it's a very narrow area. And I don't have the manpower I can go to India and find that person and then supply to the client."

Lacking social ties with the Telugu community, Body-shopU, the only non-Telugu body shop in my sample, struggled to recruit IT workers and sustain its business activities. The founder even approached me to bring in new clients for the company because it could not effectively follow a body-shop strategy to generate business through workers. Accordingly, it was the least successful body-shop in my sample.

It is important to note that access to IT workers through ethnic ties also made it relatively easy for Telugu-owned body-shops to replenish their stock of workers on a regular basis. Replenishing the stock of IT workers became a critical issue during the tight labor markets in 2005-2007 due to a high turnover of workers and the introduction of a lottery system by the United States Citizenship and Immigration Services to allocate H-1B visas to employing firms. The lottery system made it necessary for all firms to file for a lot more temporary work visas than they required. Telugu-owned body-shops with ties to Andhra Pradesh had a distinct advantage in filing massive number of H-1B applications for individual workers. The federal H-1B visa records corroborate my evidence: Telugu-owned firms in my sample, on an average, filed sixty percent more temporary work visas than non-Telugu owned firms.

Changing Conversation on the H-1B Visa Program & Diversification Initiatives of Firms

Arguments against temporary skilled worker visa programs such as H-1B started surfacing in popular press and policy circles as early as 2000, but only succeeded in its reform more than ten years later. In those ten years Indian IT staffing firms increased its dominance in the IT industry and some managed to diversity their

service lines by creating an IT solution or product development division. This section discusses the implications of differences in initial business strategies on the short-term performance and long-term evolution of client-shop and body-shop firms during 2008-2011, when the rhetoric for and against the use of H-1B visas and immigration reforms for skilled workers was hottest.

The IT staffing firms with a body-shop strategy were very successful with respect to employee head count and revenue growth during 2004-2007 when the market picked up after the internet bubble burst. Three of the six body-shops I profiled received local press coverage and won awards for their significant contributions to the growth of New Jersey. Table 3.5 reports the distribution of revenues and employees across the sampled firms by their initial business strategies in 2008. As evident, Telugu-owned firms with a body-shop strategy had significantly higher revenues and employees than non-Telugu owned firms with a client-shop strategy.

-- Insert Table 3.5 here –

Furthermore, because of their connections to IT workers in Andhra Pradesh, Telugu-owned client-shops were more successful than non-Telugu owned client-shops with respect to employee head count and revenue growth. As shown in Table 3.5, the median number of employees in Telugu-owned client-shops was 89 in 2008 (compared to 31 in non-Telugu owned client-shops) and the median revenue was $11 million (compared to $5.3 in the other group).

Despite their short-term success, Indian IT staffing firms faced a major backlash from a significant segment of pundits, business and university leaders, as

well as policy makers starting in the early 2000. Opponents of the H1-B program attributed the industry's motivation for hiring H-1Bs to its desire for cheap, compliant immigrant labor and the adverse impacts of the program on American workers, especially those over 40, in terms of hiring, salaries and career prospects (Matloff, 2003; Hira, 2010). Specifically, the arguments targeted the abuse of the H-1B program by Indian firms and the inhumanity of the practice. They backed up that characterization with stories of the 'de facto indentured servitude' of the H-1Bs from the popular press, early academic studies as well as the Department of Labor audits which had found that a significant minority of the H-1Bs were not being paid even the wage their employers had promised on the Labor Condition Applications. Ultimately, with the onset of the most severe financial crisis in 2008-2009, the balance of espoused interests shifted in favor of the opponents of the H1-B visa program. This was apparent in the fact that Indian staffing firms in New Jersey faced regulatory crackdown during 2008-09. Specifically, the United States Citizenship and Immigration Services launched a crackdown against Indian IT staffing firms on the basis that they did not conform to the definition of "U.S. employers"[10].

What were the effects of the regulatory crackdown and the escalation of arguments prompted by the opponents of the H-1B visa program? The majority of firms in my sample encountered major obstacles when it came to the diversification of their service lines and adaptation in the face of changing market and regulatory environment. Interestingly, however, initial business and human resource strategies

[10] In order to establish an employer-employee relationship, American firms are required, by law, to directly supervise the activities of their employees apart from hiring, firing and paying their workers.

did not necessarily determine the diversification initiatives of body-shop firms. During the regulatory crackdown, when the rhetoric for and against the usage of H-1Bs was hottest, and the arguments sharpest about 'appropriate' business and employment practices, conversations in Telugu cultural associations and Indian IT community in New Jersey shifted. The debates about the employer usage of H-1Bs brought the anti-normative character of labor practices in body-shops and the adverse impact of the program on local American workers into the open. Overall, these arguments in the broader society shifted the balance of conversation at the local level in favor of reducing dependence on immigrant workers and diversifying the firm into new or related lines of business.

It was in this context that founders played a significant role in providing the vision and guiding the implementation of diversification initiatives, leading to a convergence in organizational forms across body-shop and client-shop firms over time irrespective of their initial strategies. Specifically, as shown in Table 3.6, successful founders of both client-shop and body-shop firms were able to diversify into a new line of business by creating an IT solution or product development division, while preserving the 'core' IT staffing business. By contrast, unsuccessful founders, irrespective of their initial strategies, tried to scale up their activities within the same line of business and thus failed to evolve into hybrid organizations. These evolutionary differences had implications for the firms' long term sustainability. The hybrid form was more sustainable because it did not rest on highly unpredictable resources (changes in immigration laws and flows of immigrants), and because it had a business model somewhat similar to many mainstream IT firms, it was more likely

to survive in the long-term. Below I consider the factors that shaped diversification initiatives of these IT staffing firms and that subsequently enabled them to transition from a form characterized solely as a provider of temporary high-skilled labor, to one that served as an independent provider of an array of IT consulting services.

-- Insert Table 3.6 here –

In general, successful founders of both client-shops and body-shops launched four different initiatives to support diversification: diversification of top management team, development of a broader client base, provision of employee career paths, and creation of a new service line. Table 3.7 displays these initiatives by initial business strategies. As shown here, three out of the seven client-shops and two out of the six body-shops in my sample managed to evolve into hybrid organizations through the creation of IT solution or product development divisions, while preserving their 'core' IT staffing business. It is instructive to note that contrary to the predictions of organizational path dependency theory (e.g., Sydow, Schreyogg, and Koch, 2009), initial business and human resource strategies in my sample did not determine subsequent diversification initiatives. I discuss the role of founders and each initiative in detail next.

-- Insert Table 3.7 here –

First, ethnic IT staffing firms in my sample needed to develop a functionally diverse and cohesive managerial team to offer IT consulting services or software development to their clients. The process of team building required either co-opting existing 'star' employees into the managerial team or hiring experts from outside or both. Facing these choices founders of both client-shop and body-shop firms relied on

both internal co-option and external hires to expand their management team. Some firm owners co-opted their senior employees into the management team as minor partners, while others recruited experienced workers from outside on salaries. As the founder of Client-shopE noted:

"When I told Chris I had this idea, but I don't have a lot of money to spend on that, he was earning ninety dollars per hour. I said, "I can probably give you one-fourth of that., uh, but I can give you partnership." …So, you have the competency to come here, this is a platform I give you, you build it, you take some risks, I will give you base salary, $30,000, $40,000, $45,000, base salary, and you create and you take 25% of the earnings, that's how I did my project management division".

The failure of some firms to diversify their top management teams, irrespective of their initial strategies, can be traced to a lack of vision of the founders and unwillingness to give up control in running the firm as part of the diversification initiatives.

-- Insert Figure 3.2 here –

Second, one of the most important challenges that all IT staffing firms faced was to build new client relationships in IT consulting business. They lacked reputation as well as internal capabilities to convince clients in order to generate new business in the areas of software and application development. The most frequently used strategy of founders in this context was to certify their firms as the technology partner of large US based software companies such as Apple or Microsoft in order to develop capabilities and gain credentials. This is how the process worked. Firms such as Microsoft or Apple typically developed a core product like Cloud computing technologies without all the software applications necessary to customize, maintain, and support the product for their customers across a variety of industry settings.

Hence, they certified a number of software implementation companies in that specific technology domain to build the extensions and enhancements for their clients. Being a certified technology arm of a reputable firm enabled ethnic IT staffing firms to access their alliance partner's clients who often required the services of Indian staffing firms to customize the original product to their needs.

The process was aptly summarized by the founder of Body-shopR: "We developed the partners. Partners who had clients who had needs. And then we went through them. So partnership is the right way to go actually." Another related strategy was to serve as the technology arm of early stage venture-backed start-ups and help them build a prototype to secure more funding from external investors. Almost all of the successful client-shop and body-shop firms in my sample utilized one of these diversification initiatives in one way or the other. Also, they either had a software development center in India or tied up with local software firms in India to reduce their overhead expenses.

By contrast, unsuccessful founders often tried to scale up their activities through making alliances with other ethnic IT staffing companies of similar capabilities or creating a regional group to lobby for common causes to the government. The strategy of building alliances with other ethnic IT staffing firms of similar capabilities hampered a focal firm's effort in future capability development. The initiative to lobby through the regional association also back fired because the association lacked both resources and muscle power to push through any significant regulatory changes for these firms.

Third, the diversification initiative also required firms to put together a

technical team that would be responsible for delivering solutions to clients. However, an industry expert noted that the IT industry norm and workers' preferences for skill development required firms to develop an internal career path for their technical team members. Consistent with this observation, successful founders tried to offer challenging work to their technical team members through generating cutting-edge software development work from their clients, as well as provided its employees opportunities for internal growth. By contrast, because of their primary goal of growing in size through staffing, founders of unsuccessful firms did not see the importance of offering employees any internal career paths and also could not offer them career progression due to a lack of internal opportunities.

Finally, successful founders attempted to diversify service lines by preserving the IT staffing business, while using the resources and/or knowledge from the staffing business to fund and develop software products and applications. While some firms in my sample used the financial resources from their IT staffing business to launch an offshore software development office in India, the other firms actively forged links between IT staffing and software development work in the U.S. by rotating their workers between the two business segments. The owner of Client-shopF noted:

"Everything is linked to everything, very tight. Product development, we use the same resources that we use for staffing. We take the senior guys from there, because we know this guy has done this, so we know this guy will be useful for me. So it's totally interlinked."

The three client-shop firms and two body-shop firms that had combined both IT staffing and software development work in their U.S. operations evolved into hybrid organizations.

Discussion & Conclusion

This paper examines the origin of initial business and human resource strategies in entrepreneurial firms and the effect of initial business strategies on the short-term performance and long-term evolution of the firm. I take an inductive approach, using a longitudinal study of thirteen Indian immigrant-owned IT service firms in the U.S. The findings suggest that differences in founders' embeddedness in different ethnic communities (Telugu vs. Non-Telugu) in New Jersey and India, corresponding closely to their ethno-linguistic identities, shaped early strategic choices of new ventures – the pursuit of body-shop versus client-shop strategies respectively. I demonstrated how non-Telugus distinguished their pursuit from Telugu-owned body-shops, while Telugus maintained and renewed practices of body-shopping business through three mechanisms: (i) narratives to distinguish spheres of business activity, (ii) ethnic cultural associations to insulate and preserve body-shopping business pursuits, and (iii) social ties to Andra Pradesh, India, to access resources on an on-going basis to renew and expand body-shopping endeavor.

My analysis extends the growing body of research which suggests that founders education (Ding, 2011), prior knowledge and functional experiences (Burton & Beckman, 2007; Ensley, Pearson, & Amason, 2002; Aldrich & Wiedenmayer, 1993) as well as mental models for a firm (Baron, Hannan & Burton, 2001) exert enduring impact on the evolution of new ventures. According to these accounts, founders draw on prior knowledge, experiences, culturally appropriate templates and their mental models in crafting initial strategies, and structures because this enhances new ventures' legitimacy and because their own prior socialization and enculturation

presumably preclude doing otherwise. By contrast, my results suggest that differences in founders' embeddedness in different social structures corresponding closely to their ethnic identities and shared notions of resource acquisition tactics (or lack thereof) can affect early strategic choices of new ventures. It thus contributes to our understanding of the new venture creation process.

In a wider theoretical context, the findings have strong implications for the evolution of new types of firms in an industry setting. If the ethnic composition of founders has a nontrivial effect on the emergence of new types of firms in an industry, then, by analyzing shifts in founders' ethnic background and embeddedness in different social structures, we may be able to identify changes in the nature and distribution of forms in an organizational population. In this case the influx of temporary immigrant workers in the IT industry and the formation of ethnically divided founding teams seem to have contributed significantly to the emergence of new types of service firms in the IT industry.

My findings also suggest that under certain conditions initial business and human resource strategies of young firms might not impede subsequent diversification initiatives. Specifically, my analysis indicates that debates on regulatory reforms in the broader society could shift the conversation about 'appropriate' business and employment practices at the local level and affect the behavior of individual founders' to implement strategic change in organizations. Therefore, a core theoretical contribution of my study is to identify more fully the conditions under which path breaking or switching to a new regime of routines and practices are more likely to occur. It thus contributes to research on organizational path dependence (Sydow,

Schreyogg, and Koch, 2009).

Furthermore, this study extends research on ethnic entrepreneurship (Light, 1972; Aldrich & Waldinger, 1990; Portes & Shafer, 2007). Specifically, by tracing and analyzing the origin of differences in resource acquisition strategies among subgroups of a given national origin group, the paper stimulates theory development in the field of ethnic entrepreneurship.

Because my analysis rests on case studies in a single industry, one concern is the generalizability of the arguments in this paper. More extensive studies in other high-technology industry settings (e.g., engineering and manufacturing related services) that witnessed a significant increase in the number of firms founded by immigrant entrepreneurs from ethnically diverse countries such as China and Britain (Wadhwa et al., 2007) are required to test the generalizability of my argument. Nonetheless, a core theoretical contribution of my study is to identify and theorize more fully the historical origins of entrepreneurial firms' strategies through investigating with whom actors identify and to which resources they may thereby gain access; and the implications of founders' social embeddedness and shared notions of resource acquisition tactics for the evolution of the firm. This exploratory study should provide a fruitful starting point for future researchers in developing a more comprehensive understanding of how founders' background interact with local communities and broader regulatory environment to shape the organizational strategy and evolution of new ventures.

Table 3.1: **Description of sample firms and case data**

Company	Founding year	Ethnicity – Telugu versus non-Telugu	Founder(s) educational background	Founder(s) career background
Body-shopP	1998	Telugu	PhD in Agriculture & certified stock-broker	Stock-broker turned IT recruiter
Body-shopQ	1997	Telugu	PhD in Physics; PhD in Pharmacy (husband-wife)	Senior IT programmer; Research scientist
Body-shopR	1997	Telugu	Masters in engineering	Senior IT project manager
Body-shopS	2001	Telugu	Engineering degree with MBA; Bachelor's degree (husband-wife)	Senior IT project manager; IT recruiter
Body-shopT	2007	Telugu	Masters in engineering with MBA	IT business development manager
Body-shopU	2004	Non-Telugu	Masters in engineering	IT programmer
Client-shopA	2002	Non-Telugu	Engineering degree with MBA	IT business development manager

Company	Founding year	Ethnicity – Telugu versus non-Telugu	Founder(s) educational background	Founder(s) career background
Client-shopB	2000	Non-Telugu	Bachelor's degree in Economics	IT recruiter
Client-shopC	2000	Non-Telugu	Masters in engineering	IT business development manager
Client-shopD	2001	Non-Telugu	Engineering degree	Chief operating officer of a midsize IT start-up
Client-shopE	2003	Telugu	Bachelor's degree in Economics	Sales executive of a multinational & minor partner of a start-up
Client-shopF	2006	Telugu	Engineering degree with MBA	Senior IT project manager
Client-shopG	2006	Telugu	Masters in engineering (both)	Serial entrepreneurs in IT staffing industry

Table 3.2: Sources of data

Company	Archival – micro records	Number of interviews	Internal informants	External informants
Body-shopP	Record of incorporation, H-1B visa filings, internal memos, pay slips, employee databases	6	Non-participant observation (numerous informal interviews); 3 formal interviews	3 – clients, industry expert
Body-shopQ	Record of incorporation, H-1B visa filings	6	2	4 –clients, industry expert, competitors
Body-shopR	Do	4	3	1- competitor
Body-shopS	Do	4	3	1 –competitor
Body-shopT	Do	4	2	2 –industry expert, competitor
Body-shopU	Do	4	2	2 –industry expert, competitor
Client-shopA	Do	8	4	4 – competitors
Client-shopB	Do	5	3	2 –industry expert, competitor
Client-shopC	Do	4	2	2 –industry expert, competitor
Client-shopD	Do	6	5	1 - competitor
Client-shopE	Do	5	2	3 - industry expert, competitors
Client-shopF	Do	9	7	2 – industry experts
Client-shopG	Do	3	2	1 – industry expert

Table 3.3: Dimensions of Client-shop & Body-shop strategies

Dimensions	**Client-shop (Non-Telugu ethnicities)**	**Body-shop (Telugu ethnicities)**
Business strategy	Direct clients ▪ ties to big staffing firms ▪ ties to end users in mid-size firms &/ or government agencies	Ethnic enclave strategy ▪ ties to ethnic Client-shop clients firms ▪ a few ties to big staffing firms
HR strategy: Recruitment	▪ Experienced immigrants thro' H-1B visa based on job offers from clients ▪ Experienced natives ▪ Hire from Body-shop bodies	▪ Experienced immigrants thro' H-1B visa without any job offers from clients: 'bench' model ▪ Inexperienced foreign graduates locally
HR Strategy: Training	None	Considerable
HR Strategy: Placement	Some	None
HR Strategy: Pay	Salary & benefits	Percentage of workers' earnings

Table 3.4: Distribution of Client-shop & Body-shop firms across ethnicity & participation of founders in ethnic business and regional cultural associations

Initial strategy	Ethnicity of TMT members	Active participant of ethnic business &/ Telugu cultural associations
Body-shopP	Telugu (Originated from Andhra Pradesh)	Telugu only
Body-shopQ	Telugu	Telugu only
Body-shopR	Telugu	Telugu only
Body-shopS	Telugu	Telugu only
Body-shopT	Telugu	Telugu & ethnic
Body-shopU	Non-Telugu (Originated outside Andhra Pradesh)	Ethnic only
Client-shopA	Non-Telugu	None
Client-shopB	Non-Telugu	None
Client-shopC	Non-Telugu	Ethnic & non-Telugu cultural association
Client-shopD	Non-Telugu	Ethnic & sports
Client-shopE	Telugu	Ethnic & Telugu
Client-shopF	Telugu	Telugu only
Client-shopG	Telugu	Telugu only

Table 3.5: Distribution of revenues and employees across initial business strategies in 2008

Companies	Annual revenues	Median revenues	Employees	Median employees
Body-shopP	$34 million		300	
Body-shopQ	$6 million		30	
Body-shopR	$12.5		120	
Body-shopS	$10 million	$10.5 million	50	50
Body-shopT	$11 million		50	
Body-shopU (Non-Telugu)	$1 million		6	
Client-shopA	$5 million		25	
Client-shopB	$9 million		58	
Client-shopC	$3 million		16	
Client-shopD	$4 million	$5.3million (excluding Telugu firms)	23	31 (excluding Telugu firms)
Client-shopE (Telugu)	$13 million		98	
Client-shopF (Telugu)	$10 million		110	
Client-shopG (Telugu)	$10 million	$11 million (excluding non-Telugu firms)	60	89 (excluding non-Telugu firms)

Table 3.6: Effects of initial strategies on approaches to diversification

Initial strategy	Approach to diversification
Successful Client-shops & Body-shops	New line of business
Unsuccessful Client-shops & Body-shops	Grow bigger in the same line of business

Table 3.7: Distribution of diversification initiatives across initial business strategies

Dimensions	Client-shop	Body-shop
Diversification of top management team	Some: 3/7	Some: 2/6
Development of a broad clientele	Some: 3/7	Some: 2/6
Provision of employee career paths	Some: 3/7	Some: 2/6
Integration of IT staffing & software development	Some: 3/7	Some: 2/6

Figure 3.1: Origin of initial business and human resource strategies in IT service ventures

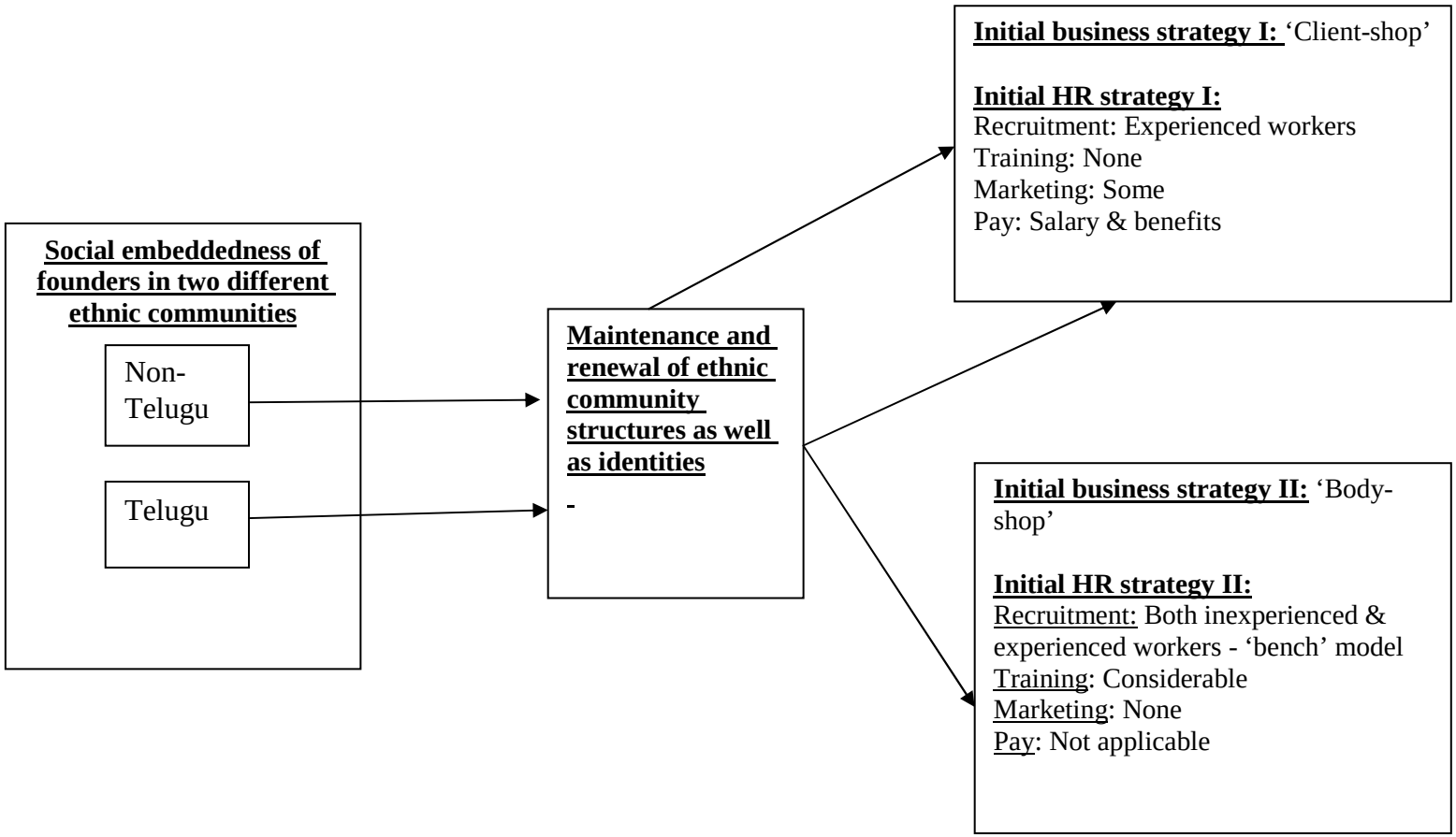
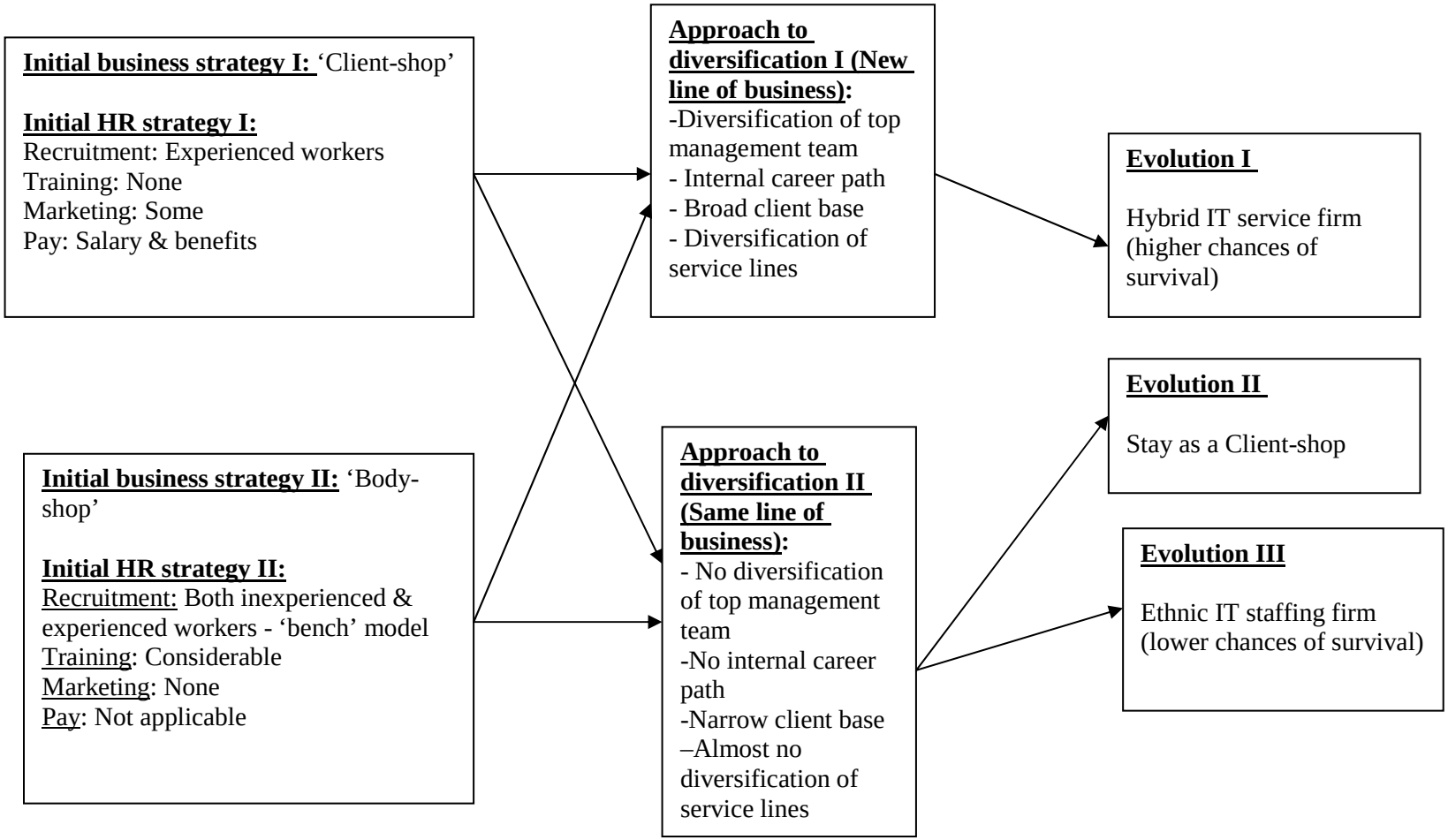


Figure 3.2: Evolution of IT service ventures



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CHAPTER 4

CONCLUSION

I began this project with an interest in exploring the social processes that shape employment and entrepreneurship among high-skilled immigrants in the United States. My professional and personal experiences with immigrant scientists, engineers as well as entrepreneurs had fostered a strong curiosity about the hurdles my colleagues and friends faced and the choices they made in their daily lives. From my vantage point, I had directly encountered the aspirations, dreams and career strategies of immigrant graduates and watched the obstacles as well as tactics of ethnic entrepreneurs. Beyond the interactions and behaviors I had observed at the interpersonal level, I also wondered if these individual choices stemmed from their positions in the collective (Sewell, 1992) and were indicative of larger social processes.

These questions that emerged from my life experiences shaped my dissertation research. My reading into the economic sociology and organizational theory literatures made it apparent that current scholarly discussion in the field did not pay sufficient attention to the ascendency of immigrant professionals in the science and engineering workforce in the U.S. (Freeman & Goroff, 2009) and ethnic dominance in some highly skilled sectors such as information technology (Xiang, 2007). Accordingly, reasons underlying variation in strategic choices of high-skilled immigrant workers and ethnic entrepreneurs were not being actively taken up in studies of either job search or entrepreneurship. Hence, I became interested in

understanding the social processes that influence strategies of ethnic entrepreneurial firms as well as career outcomes of high-skilled immigrant workers. I used social network and social identity theories to help me gain this understanding.

Specifically, drawing on social 'embeddedness' (Granovetter, 1985; Uzzi, 1996) and social identity theories (Tajfel & Turner, 1986; Turner, 1987), I examined a variety of ways in which individuals' embeddedness in different social structures, corresponding closely to their ethnic identities, affected the job search strategies of recently-arrived, high-skilled immigrants as well as the evolution of immigrant-owned professional service firms. Using extensive fieldwork coupled with national data sets, I explored these general questions in two separate studies. One focused on how the clustering of students from different national origin groups in academic organizations shaped the job search methods of immigrant scientist and engineering graduates early in their career. In the second study, I turned attention to the micro-level processes, examining factors that affected macro-level variation in initial business and human resource strategies of ethnic entrepreneurial firms. In addressing these issues, I drew upon theoretical and empirical studies of social embeddedness and ethnic identities as influences on job search strategies and entrepreneurship, and contributed to the literatures on organizational theory, economic sociology of job search and ethnic entrepreneurship. Below I emphasize and summarize the four theoretical contributions of the project.

First, this project serves to add to current understandings of social embeddedness (e.g., Granovetter, 1985; 1995; Uzzi, 1996; Obukhova & Lan, 2013) and self-categorization processes (e.g., Chattopadhyay, Tluchowska, & George, 2004;

Chatman, Polzer, Barsade, & Neale, 1998; Tsui, Egan, & O'Reilly, 1992) within the understudied contexts of higher education organizations and ethnic entrepreneurial firms. More specifically, it assesses the applicability of prior theories in lesser-known populations and extends current theories by developing a richer and more accurate understanding of how compositional categories (e.g., national origin, ethnicity) can serve as salient bases of social identification to particular groups within the relevant context.

Second, this research offers new empirical insights that link individual choices, social relationships and social systems together by studying the labor market entry of new science and technology graduates and early strategic choices of ethnic ventures. Thus it responds to renewed calls to reconnect organizational theory to the study of work, entrepreneurship and individual decision making (Stern & Barley, 1996; Hitt, Beamish, Jackson, & Matheiu, 2007; Bechky, 2011). In sum, the project may bring enhanced conceptual clarity to research in career studies, organization theory, and entrepreneurship.

Third, a core contribution of the study is to inform our understanding of scientific and technical work literature. At a time when the attraction and retention of immigrant scientists and engineers are increasingly seen as an engine of economic growth and a driver of firm competitive advantage (Stephan, 2012), the scarcity of scholarly discussion in management literature on nation-based diversity has left us unprepared to engage with contemporary issues of organizing in science and technology. Overall the project may enhance greater understanding of diversity in high-skilled U.S. workers' job strategies and career patterns.

Fourth, by tracing and analyzing differences in business and human resource strategies of entrepreneurial firms, the project stimulates theory development in the field of ethnic entrepreneurship. Broadly speaking, if the ethnic composition of founders has a nontrivial effect on the emergence of new types of firms in an industry, then, by analyzing shifts in founders' background and social ties, we may be able to identify changes in the nature and distribution of forms in an organizational population. A related contribution of my study is to identify more fully the conditions under which initial strategies of young firms may not impede subsequent diversification initiatives, but rather make it possible to switch to a new regime of practices. Taken as a whole, my research contributes to work on organizational theory, career studies and entrepreneurship.

Future Research Directions

In this project, I illustrate that a deeper understanding of high-skilled work requires a fine-grained understanding of different social processes that underpin individual career and entrepreneurial decisions across diverse populations and institutional contexts. Continuing with my research interests on high-skilled immigrants, looking forward, I plan to engage in two related streams of research: 1) determinants of return migration and entry into entrepreneurship; and 2) the embeddedness of ethnic entrepreneurs in home versus host countries and its influence on the organizational form of new ventures. For the first project I will continue to exploit data collected by the National Science Foundation's Survey to examine how social processes affect the decisions of immigrant scientists and engineers to return to their home countries and enter into entrepreneurship. In contrast to work that treats

return migration and entrepreneurial decision processes as highly individualized and atomized, I propose to test that both are strongly shaped by the ethnic ties that are formed during the migration process.

Turning to my second research stream, I would like to build on my research program to study how variation in diversification initiatives of professional service firms included in my dissertation sample is related to differences in social embeddedness of ethnic entrepreneurs in home versus host countries. My plan is to move beyond work that tends to reduce immigrant entrepreneurship to an ethnic phenomenon without clearly working out theoretically what principally distinguishes the organization of ethnic firms from other forms of businesses. This research should provide a fruitful starting point for future researchers in developing a more comprehensive understanding of social processes and transnational linkages that support employment and entrepreneurship among high-skilled immigrants.

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