

SKILLED LABOR MIGRATION TO THE UNITED STATES:
CHANGING TRENDS AND IMPACTS

Presented to the Graduate Council of
Texas State University-San Marcos
in Partial Fulfillment
of the Requirements

for the Degree

Master of ARTS

by

Jessica D. Butterworth, B.A.

San Marcos, Texas
May 2013

COPYRIGHT

by

Jessica Devlyn Butterworth

2013

FAIR USE AND AUTHOR'S PERMISSION STATEMENT

Fair Use

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgment. Use of this material for financial gain without the author's express written permission is not allowed.

Duplication Permission

As the copyright holder of this work I, Jessica Butterworth, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

ACKNOWLEDGEMENTS

I am deeply grateful to my advisor, Dr. Frederick Day. You have been a pleasure to work with, and I am so thankful for your persistence and unwavering belief in my ability and competency to complete this work, even when I doubted myself. You have been patient and encouraging, caring and diligent, supportive and honest. You have challenged me to consider new ideas and concepts and to think outside of the box. Often I have felt that you have been like a father encouraging me to explore all the possibilities the world has to offer; to worry less about “having it all,” and to be happy in doing what is most fulfilling to me in life. Thank you.

I would also like to thank members of my thesis committee, Dr. Sarah Blue and Dr. Robert Gorman, for their diligent reviews and comments that resulted in this finished work. Without your suggestions, comments, critique and belief that this thesis could be a solid piece of work, I would not have finished, nor have been proud of the final product. Thank you for your efforts and insightfulness to the topic.

I would like to thank my husband, Ian. You have provided consistent encouragement and maintained a positive attitude throughout this process, even when I felt I would not finish! Thank you for our numerous discussions and for showing an interest in what I was writing, even when I did not want to talk about it! Your patience has been very important and your belief in me, monumental. I love you.

Lastly, I would like to thank my parents. You have always shown infinite support to all my endeavors, and this thesis has been one that has challenged me in many ways. I am grateful for your encouragement to always finish what I start. In this case, although it took longer than expected, you never doubted that I would successfully finish this work, and your belief in me has been paramount and more important than any other accomplishment in my life. I love you both – and will *ricordi chi se* – always.

This manuscript was submitted for final review on November 16, 2012.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	v
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
CHAPTER	
I. Introduction.....	1
II. Highly Skilled Immigration to the United States	6
Historic and Political Aspects of Highly Skilled Immigrants	6
Geographic Settlement Patterns of Highly Skilled Immigrants.....	10
III. The Debate: Highly Skilled Immigrants in America.....	15
Brain Drain.....	16
The U.S. Economy Needs Highly Skilled Foreign Workers.....	18
The Need for Highly Skilled Workers is exaggerated.....	19
Economic Demand for Highly Skilled Immigrants.....	21
Higher Education in America	26
IV. Factors Underlying High-Skilled International Migration.....	34
Contemporary Migration Theories.....	35
Human Capital and Social Capital.....	37
How Social Capital Works.....	40

Reception..... 43

V. The International Race for Talent.46

VI. Conclusion: The Future of American Innovation.....54

WORKS CITED.....57

LIST OF TABLES

Table	Page
1. Share of Foreign-Born Population on Professional Occupations by Region of Birth 2006.....	22
2. Birthplace of Immigrant Scientists and Engineers by Region and Other Characteristics: 2003.....	29

LIST OF FIGURES

Figure	Page
1. Immigration Skill Ratio, 100 Largest Metropolitan Areas, 2009.....	12
2. Milken Institute Tech Pole 2007.....	13
3. Thirty U.S. Companies with Most Job Openings for Skilled Positions (U.S.).....	25
4. Bachelor's Degrees Conferred by Degree-Granting Institutions to Natural Born American Students in Selected Fields of Study: 1998-99, 2003-04, 2008-09.....	29
5. Most Important Reason Given by Immigrant Scientists and Engineers for Decision to Come to the United States, by Year of First Entry: 2003.....	32

CHAPTER I

INTRODUCTION

America has long been considered the world's leader in technological innovation and advancement. Over the course of the last few years, this position has been challenged. News headlines and commentary questioning the primacy of American innovation are becoming more prevalent: "Is America Losing Its Mojo?" "Can America Still Innovate?" (Zakaria 2009), "Invent, Invent, Invent," (Friedman 2008) and "How America Fell Behind," (Friedman 2011). Changes in the United States have taken place, stemming from the downturn of the economy in both 2001 and 2008, and political ramifications of the September 11th terror attacks. These changes, coupled with xenophobic fears that have crippled the U.S. immigration system, have adversely affected the flows of high-skill migration upon which the U.S. has maintained its technological lead in the world. Some argue the impacts of these changes threaten the competitive edge the U.S. has held over the world in technological innovation. Traditionally attracting the best and brightest workers and students around the world, the U.S. might possibly be facing the loss of high-skilled individuals whom offer significant potential for future scientific endeavors. However, as the information technology industry paints a rather grim portrait of the future of American innovation, employee organizations, unions and researchers argue that claims of IT labor shortages are false and exaggerated. While the

IT industry maintains a shortage of skilled IT workers threatens America's global competitiveness, others believe the H1-B visa program "is driven by an industry quest for cheap labor" (Watts 2001).

The United States' competitive edge in science and technology has been the product of immigration, and without it, the growth in the United States over the last century may not have been possible. Immigration policies have fueled the development and production of technologies that have given the United States its title as world's leading technological innovator. In 2003, of the 21.6 million scientists and engineers in the U.S., 16 percent (3,352,000) were immigrants (Kannankutty and Burrelli 2007). "Half of Silicon-Valley start-ups have one founder who is an immigrant or first-generation American," (Zakaria 2007, 2011) and in 2007, 26 percent of patents filed in the United States had at least one foreign national listed as an author. All the while, the rise of the rest of the world has perhaps detracted significantly from the magnet that the United States has traditionally been in attracting the best and the brightest immigrants. Over a period of decades, countries such as China and India have suffered from a "Brain Drain," as America attracted thousands of valuable and talented people to fill its laboratories, research institutions, and increase the competitiveness of American technological innovation. However, new economies and emphasis on technological competition with other countries have challenged the prospects these individuals once sought in the United States. Frustrated with the American bureaucracy and political debates questioning the value and necessity of foreign skilled workers and the flight of corporations to countries with lower corporate taxes and cheap labor, high skilled workers are migrating to other countries such as Canada and Australia where the restrictions are not as stringent and the

value of high-skill labor is not only recognized, but in demand.

Following this introduction, this study will explore a brief history of immigration policy in the United States since 1965 and will provide a framework explaining how the flows of migrants and the trends of migrant composition have changed over time with a focus specifically on high skill migration under the H1-B visa program. The second portion of the thesis will examine contributing factors, such as the demand for workers in specific industries; quality and attractiveness of higher educational institutions; and a discussion of human capital, social capital and receptivity as determinants in attracting highly skilled migrants. This thesis will conclude with discussion of the future of American innovation and technological advancement in light of the study findings in regards to factors underlying highly skilled migration to the United States.

This thesis will examine the dynamics between the accumulation of human capital and social capital, vital components in attracting highly skilled foreign immigrants and essential elements needed to evaluate the processes of immigrant settlement patterns and incorporation in America. Contrary to commentary alluding to America's decline in leading the world in technological innovation and advancement, this paper hopes to illuminate a more realistic depiction of the future of American innovation – one that recognizes the high demand for highly skilled workers and the strength of American universities and colleges, both of which attract highly skilled foreign immigrants from around the world. In addition, this paper describes a crucial element overlooked when examining the dynamics between human capital and social capital, the factor of receptivity. Reception facilitates the flows of highly skilled foreign immigrants into the United States, altering settlement patterns to areas that allow for social capital

accumulation. These areas “bring together people who are like one another in important respects (ethnicity, age, gender, social class, and so on)” (Bretell 2005). In terms of high-tech growth in the United States, attracting highly skilled foreign immigrants to areas with high-tech industries, reception is critical in establishing environments conducive to attracting these workers and students.

This issue is critical to the future of the United States because America has depended on foreign high skill immigration to maintain its competitive edge in technology and innovation. This research seeks to examine highly skilled foreign migration to the United States in terms of human capital, social capital and reception to examine the future of the H1-B visa program and the future of American innovation. This thesis will first review the trends of highly skilled migration in the United States and a brief history of the H1-B visa program. The thesis will next examine the debate surrounding highly skilled migration in the United States, economic demand for highly skilled workers, and higher education in the United States, both attracting highly skilled workers and students whom desire to become the next generations of technological innovators. A discussion of factors underlying highly skilled international migration will follow, exploring theories such as Brain Drain, contemporary migration theories, human and social capital, and reception. These factors will help put into context, the global competition the United States now faces in maintaining a competitive edge in the world of technological innovation, and an overview of other governments’ immigration policies will help evaluate the United States’ role in attracting highly skilled workers, as discussed in the final chapter. The conclusion will follow in which a review and summary of each section will allow the reader to see the bigger picture in understanding the role of the

United States in the future as a global leader in technological innovation, and will offer suggestions for future research and study.

As there is no single agreed upon definition for an international highly skilled migrant, this research examines international migration patterns of information technology workers, researchers, scientists, students and any additional individuals working towards a college degree, college degree holders or those with higher levels of education as a reasonable surrogate for “highly skilled” migrants. This research seeks to examine factors in determining highly skilled foreign migration while trying to unearth and identify reasons for these trends. These findings are not the result of research with primary data, but the exploration of academic literature and policy discussions.

CHAPTER II

HIGHLY SKILLED IMMIGRATION TO THE UNITED STATES

Immigration has perhaps shaped the United States more than any social or economic process. Combined with globalization, challenging the preexisting patterns of large-scale mobility of individuals, in-flows of such large-scale migration to the United States has created distinctive patterns over the last thirty years. This chapter couches the debate on highly skilled immigration in the context of recent trends in terms of both temporal and spatial trends. First, this chapter will discuss three critical waves migration to the U.S. in the 21st century, secondly the importance of legislation, including the creation of H1-B visas, and thirdly, the spatial distribution of these immigrants in America.

Historic and Political Aspects of Highly Skilled Immigrants

Three critical waves of migration to the United States in the 20th century help conceptualize current American dominance in global innovation and technology, beginning in the 1930s (Zakaria 2009). The first wave involved migrants seeking refuge and opportunity to escape the massive destruction engulfing Europe, as political, economic and social systems were completely devastated in World War II (Zakaria 2009).

The flight of skilled and educated immigrants who left Europe and filled American universities and research facilities characterized the second wave of migration, which took place quickly after the first as Europe was beginning to slowly rebuild itself. The third wave of migration was based on government funding - fueled no less by the threat of the Cold War, during which the United States government began to invest heavily in research and development as the race raged on (Zakaria 2009).

The year of 1965 was critical for high skilled migration, marking a change in immigration flows that has continued to have lasting impact on immigration to the United States. Changes in US immigration patterns are attributed to the passage of the Immigration Act of 1965 by President Lyndon B. Johnson and subsequent reforms in 1988, 1990, and 1996 (Lowell 2001). Removing the highly criticized quota-based preferential system that had been in place, which favored migrants of European descent, the bill sought to give preference to migrants that already had families in the U.S. or were highly skilled or accomplished. The preference system also allocated visas for employment-based immigration, and of the remaining twenty percent of visas reserved for those from the Eastern Hemisphere, ten percent were designated to professionals and immigrants with specific skills and education, and the remaining ten percent to workers (Usdansky 2000). The 1965 law did, however, take into consideration the benefit to the U.S. economy without taking jobs away from native-born workers. It was not until the 1970s that H-1B visas were used to bring foreign workers to the United States. In 1976, Congress passed the Immigration and Nationality Act Amendments, extending the preference system created in 1965 to include immigrants from the Western Hemisphere, allocating employment-based visas to expand from 34,000 to 58,000. However, this

increase had little bearing on the overall proportion of immigrants entering the U.S. under this visa system – in 1980, “only 44,369 or eight percent of the 530,639 immigrants admitted to the U.S. came via visas or workers or their family members” (Usdansky 2000).

In 1988, legislation created visas for educated, English-speaking immigrants with occupation skills for areas in which the U.S. suffered labor shortages (Usdansky 2000), and the Kennedy-Simpson bill set an annual cap of 590,000 such visas per year. While passing the Senate but not the House, the intended purpose of the bill was to allow qualified workers into the country that would not have met the visa terms under the family reunification requirement. In 1989, a similar version of the Kennedy-Simpson bill passed the Senate but not the House. The bill aimed to include professionals with advanced degrees and education and persons recognized to possess exceptional talent. The 1990 Immigration Act profoundly impacted the immigration of highly skilled workers. Non-immigrants were permitted to enter the U.S. under the H1-B visa category for employment-related purposes, requiring employers to fulfill labor certification requirements to ensure that no U.S. resident with the equivalent qualifications was available for employment (Watts 2001). The 1990 Act capped the number of H-1B visas at 65,000 a year, each visa valid for three years, with a visa holder’s stay in the U.S. limited to six years. It required the visa holder to have a bachelor’s degree or equivalent in their job field, applied only to workers but not their families (Martinez-Herrera 2008). Additional categories for nurses, prominent scientists, educators, athletes and entertainers were developed during this time as well (Usdansky 2000, Watts 2001).

In 1996, attempts to reform employment-based immigration by decreasing the

number of permanent, employment-based immigrants, charging employers for bringing them to the United States, and requiring employers of H-1B visa holders to pay 110 percent of the wages earned by natives were unsuccessful. The IT industry lobbied for an increase in the H-1B visa cap, claiming, “American companies today are engaged in fierce competition in global markets,” and that “companies across America are faced with severe high skill labor shortages that threaten their competitiveness” (The American Competitiveness Act 1998, section 2). The claims asserted by industry and business lobbyists were supported by several factors: the annual cap of 65,000 visas as reached quickly, bringing admissions at a standstill, at the same time the U.S. Commerce Department “issued a report predicting a coming shortage of high-tech workers” (Usdansky 2000).

In 1998, bills to raise the ceiling of 65,000 workers to 115,000 were met with debate as to whether a true shortage of workers existed or whether employers were attempting to take advantage of H-1B classification in order to hire workers at lower rates of pay who would not challenge employers for fear of losing their jobs (Usdansky 2000). Also included in the debate were concerns of worker protection for native workers and tighter immigration controls. Proponents of the ceiling increase received some support for the desired increase in May of 1998 when the annual quota of 65,000 H-1B visas was met, stopping the issue of visa for the remainder of the year. In October, the H-1B visa cap was raised to 115,000 for 1999, 115,000 for 2000, 107,500 for 2001 and then lowered back to 65,000 in 2002 under the American Competitiveness Workforce Improvement Act (ACWIA) (Watts 2001).

In 2000, Congress passed the American Competitiveness in the 21st Century Act,

lifting the visa cap of H-1B visas to 195,000 for the fiscal years 2001, 2002, and 2003, with a planned decrease to 65,000 in 2004. After 2004, the cap was raised to 85,000 visas, where it has remained, even as immigration to the United States faced dramatic changes after the terror attacks on the World Trade Center and the Pentagon killed more than 3,000 people. Antiterrorism laws were passed shortly after the attacks, most notably the Patriot Act, which gave the Attorney General the ability to “detain any foreigner designated a danger to U.S. national security,” (Martin and Midgley 2006), yet the visa ceiling of H-1B visas was not particularly affected.

Geographic Settlement Patterns of Highly Skilled Immigrants

Until the 1990s, two-thirds of all immigrants lived primarily in five states: California, New York, Florida, Texas and Illinois (Singer 2004). These inflows greatly affected cities such as Houston, Miami, San Diego, and Los Angeles, which experienced the sharpest growth of migrant populations. Other states experiencing foreign born population growth include those situated in the West, clustering around Nevada, Arizona, Colorado, Utah and Idaho; Southeast states such as the Carolinas, Georgia, Tennessee, and Kentucky; and states that have received relatively few immigrants over the last few decades, such as Minnesota, Nebraska, and Arkansas (Singer 2004).

Gateway cities serve as entrance points for immigrants, allowing them to settle and find places to work, live and establish their families (Singer 2004). As it follows, these cities become symbolic destinations, attracting significant numbers of immigrants based on opportunities for employment, education and tight-knit cultural communities

that offer support and kinship. Gateway cities are metropolitan populations greater than a population of 1 million, with a historical presence of foreign-born. Former immigrant gateways have included cities such as Baltimore, Buffalo, Cleveland, Detroit, Philadelphia, Pittsburgh and St. Louis, which held an above natural average in percentage of foreign born in the early 1900s; Continuous gateway cities are Boston, Chicago, New York, Newark, and San Francisco with an above national average every decade (1900-2000). Post-World War II cities include Houston, Miami, Los Angeles, San Diego, and Fort Lauderdale, having an above national average of foreign born after 1950: Emerging cities include Atlanta, Dallas, Fort Worth, Las Vegas, Orlando, Washington, D.C., and West Palm Beach, which have seen an above national average after 1970, and especially in the 1980s. Emerging cities that have had low percentages of foreign-born for the entire 20th century include Austin, Charlotte, Greensboro-Winston-Salem, Raleigh-Durham and Salt Lake City. These metropolitan areas grew rapidly and the foreign-born population saw an aggregate increase of 464 percent over the last decade (Singer 2004).

Metropolitan areas that built around towns with colleges and higher learning institutions have large highly skilled immigrant populations because they attract students and researchers from abroad whom either stay for extended periods or find employment opportunities and remain in the United States. This trend can be seen in the cities such as Seattle, San Francisco, and Washington D.C., and along coastal areas and cities traditionally known as centers of culture, knowledge, and employment opportunities, as demonstrated in the following map, represented by blue triangles pointing upward (figure 3).



Figure 1. Immigration Skill Ratio, 100 Largest Metropolitan Areas, 2009
Source: Hall, Matthew, Audrey Singer, Gordon F. De Jong and Deborah Roempke Graefe. 2011. The geography of immigrant skills: Educational profiles of metropolitan areas. *Metropolitan Policy Program*.

In its Tech-Pole index, the Milken Institute has provided a composite measure of talent on the location of high-technology industry. Examining locations and patterns of growth on nineteen individual high-tech industries, the Tech-Pole index examines individual metro areas to determine over-all high-tech performance (Milken Institute 2009). Top performing U.S. cities included Silicon Valley, Seattle, Cambridge, (Boston area) Washington D.C., Los Angeles, Dallas, San Diego, Santa Ana, New York City and

San Francisco (see figure 1). These areas are popular destinations for highly skilled migrants in terms of the educational and employment opportunities in high-tech industries.

Total high-tech results*
Top fifty ranked by 2007 tech pole scores

Current rank	2003 rank	Metro area	Employment (thousands)	LQ	Share of North American wages	Tech pole scores
1	1	San Jose-Sunnyvale-Santa Clara, CA	244.0	4.6	5.7%	100.0
2	3	Seattle-Bellevue-Everett, WA	226.3	2.7	3.2%	46.4
3	2	Cambridge-Newton-Framingham, MA	183.6	3.4	2.8%	45.2
4	5	Washington-Arlington-Alexandria, DC-VA-MD-WV	275.7	2.0	4.2%	41.8
5	4	Los Angeles-Long Beach-Glendale, CA	376.4	1.6	4.2%	40.2
6	6	Dallas-Ft. Worth-Irving, TX	187.7	1.5	2.4%	21.8
7	7	San Diego-Carlsbad-San Marcos, CA	136.4	1.8	2.0%	19.3
8	11	Santa Ana-Anaheim-Irvine, CA	147.0	1.7	1.6%	17.7
9	9	New York-White Plains-Wayne, NY-NJ	262.0	0.9	3.9%	16.8
10	8	San Francisco-San Mateo-Redwood City, CA	106.4	1.8	2.0%	16.1
11	13	Philadelphia, PA	145.4	1.3	1.9%	14.4
12	12	Atlanta-Sandy Springs-Marietta, GA	164.1	1.1	1.9%	14.0
13	10	Edison, NJ	103.5	1.7	1.5%	13.9
14	14	Chicago-Naperville-Joliet, IL	200.0	0.9	2.5%	13.3
15	25	Toronto, ON	157.4	1.1	1.3%	12.5
16	15	Oakland-Fremont-Hayward, CA	96.0	1.6	1.4%	12.1
17	18	Minneapolis-St. Paul-Bloomington, MN-WI	131.0	1.2	1.5%	11.9
18	17	Denver-Aurora, CO	107.5	1.5	1.3%	11.8
19	27	Montreal, QC	128.2	1.3	1.0%	11.8
20	16	Austin-Round Rock, TX	81.5	1.8	1.1%	11.6
21	21	Houston-Sugar Land-Baytown, TX	151.7	1.0	1.9%	11.6
22	29	Huntsville, AL	42.5	3.5	0.4%	10.5
23	20	Phoenix-Mesa-Scottsdale, AZ	124.9	1.1	1.4%	10.4
24	31	Wichita, KS	50.8	2.9	0.5%	10.3
25	23	Bethesda-Gaithersburg-Frederick, MD	67.8	2.0	0.9%	10.2
26	24	Durham, NC	44.4	2.6	0.7%	9.7
27	28	Portland-Vancouver-Beaverton, OR-WA	88.1	1.5	1.0%	9.6
28	19	Boulder, CO	34.0	3.5	0.5%	9.3
29	26	Newark-Union, NJ-PA	84.9	1.4	1.3%	9.3
30	22	Warren-Farmington Hills-Troy, MI	90.6	1.3	1.1%	9.0
31	30	Kansas City, MO-KS	82.2	1.4	0.9%	8.4
32	32	Baltimore-Towson, MD	92.9	1.2	1.1%	8.3
33	35	St. Louis, MO-IL	86.1	1.1	0.9%	8.7
34	44	Salt Lake City, UT	54.8	1.5	0.5%	5.6
35	36	Tampa-St. Petersburg-Clearwater, FL	76.9	1.0	0.7%	5.6
36	64	Vancouver, BC	69.5	1.1	0.5%	5.6
37	66	Ottawa, ON	42.8	1.8	0.4%	5.4
38	34	Raleigh-Cary, NC	45.7	1.5	0.6%	5.3
39	39	Albuquerque, NM	39.3	1.7	0.5%	5.2
40	33	Nassau-Suffolk, NY	71.9	1.0	0.8%	5.1
41	40	Indianapolis, IN	58.9	1.1	0.7%	4.9
42	38	Fort Worth-Arlington, TX	57.5	1.1	0.6%	4.8
43	46	Orlando-Kissimmee, FL	63.6	1.0	0.7%	4.7
44	47	Hartford-West Hartford-East Hartford, CT	48.4	1.3	0.6%	4.7
45	50	Columbus, OH	57.0	1.0	0.6%	4.4
46	45	Pittsburgh, PA	63.3	0.9	0.6%	4.3
47	41	Bridgeport-Stamford-Norwalk, CT	39.0	1.5	0.5%	4.3
48	49	Palm Bay-Melbourne-Titusville, FL	26.3	2.1	0.3%	4.1
49	42	Lake County-Kenosha County, IL-WI	35.0	1.5	0.5%	4.1
50	37	Colorado Springs, CO	27.9	1.8	0.4%	4.0

Sources: BLS, Moody's Economy.com, Statistics Canada.

*Note: Due to a lack of recent data, Mexico was excluded from these rankings. An analysis of Mexico's state-level performance, based on 2003 data, is found later in this report.

Figure 2. Milken Institute Tech Pole 2007.

Source: Milken Institute, Executive Summary 2009.

The concentration of highly skilled workers reflects the locations of the plants and

campuses comprising America's high-tech industries. Silicon Valley (San Jose) ranked first in the Milken Institute Tech-Pole index (see figure 2), is noted for its "unmatched ability to spawn entrepreneurial firms that create new products, services, and even entire industries, while sustaining major high-tech anchor firms that remain at the leading edge of innovation in their industries" (Milken Institute 2009, 1). Interestingly enough, not only do foreign highly-skilled migrants come to work for numerous firms in Silicon Valley, their presence has fostered what is referred to as "brain circulation," a process in which foreign firms have become more embedded in the region. Many "foreign born engineers, software developers, and tech-savvy entrepreneurs have left Silicon Valley and returned to their native countries" seeking new opportunities to partner and form alliances with their former colleagues in Silicon Valley (Milken Institute 2009, 1). Seattle, ranked second place in the Tech-Pole index, has recently emerged as a major destination for highly skilled migrants, employing 226,300 high tech workers in the metro area, and is home to Microsoft and start-up firms. Boston, home to Harvard University and MIT, has a "local talent pool that comes from locations all over the planet" (Milken Institute 2009, 1) and Cambridge is a major scientific research and development center.

CHAPTER III

THE DEBATE: HIGHLY SKILLED IMMIGRANTS IN THE UNITED STATES

Immigration has perhaps shaped the United States more than any social or economic process. Combined with globalization, challenging the preexisting patterns of large-scale mobility of individuals, in-flows of such large-scale migration to the United States has created distinctive patterns over the last thirty years. The United States relies heavily on foreign human capital to fulfill its need for both high and low skilled laborers, and receives the largest recorded number of both documented and undocumented foreign migrants. While the United States continues to maintain a powerful position, American financial and economic interests face increasing competition from other growing global economies and businesses.

Immigration has helped to shape the face of American innovation and its prosperity, success, and competitiveness in global markets and competition, but has often been subject to major debates. One dominant debate over immigration questions whether the presence of foreign migrants provide the United States with a continual source of economic strength and scientific innovation, or whether their presence depresses natives' wages, increases unemployment, and discourages native workers from seeking

employment in various competitive fields. Another dominant debate questions whether a high-skilled labor shortage actually exists.

Brain Drain

The British Royal Society, describing the outflows of British scientists to the United States in the 1950s and 1960, first coined the term of “Brain Drain” in the 1960s. Expanded upon for several decades (Bhagwati 1972, Roa 1979), the concept of Brain Drain was chiefly concerned with receiving countries gaining talent at the expense of sending countries, as people with higher education levels began leaving their native countries leaving in droves. Numerous advantages for receiving countries have been noted, from increased knowledge and collaborations; opportunities for scientific and technological advance; increased research and development; and overall increased economic activity. Recently, research has also noted that sending countries also experience positive effects related to high-skill migration, including increased knowledge flows; possibilities for collaboration; return natives with increased skills, education, and human capital; remittances sent home; and increased incentives for natives to seek higher skills at home. Global benefits are numerous too, from increased employment and educational opportunities; increased abilities for use of rare and unique skills; increased human capital investments and return; stronger information networks; and increased global commerce.

Opponents of international high-skill migration focus mainly on the negative effects of the Brain Drain, framed often in terms of unfair competition between

developed and under-developed countries. Consequences suffered by sending countries largely represent the loss of valuable human capital needed to support and fuel the source countries' productive capabilities. However, receiving countries can also experience negative effects from highly skilled migration – native workers' incentive to seek higher education is often depressed; language and cultural barriers can be politicized and divisive; gains in technology and innovation are ultimately shared with competing firms, businesses and hostile countries (Regets, 2007).

Over the course of the last few decades, immigration policies around the world have focused on attracting highly skilled workers. For highly skilled workers capable of performing skilled jobs, their human capital is a valued asset, especially in high-tech industries related to science and engineering. Highly skilled workers generate economic power and value, making it is easy to understand why the U.S. is concerned with attracting the world's best and brightest. There are two very different portrayals of the debate over highly skilled workers. The IT industry and associated labor and employee organizations claim a shortage of skilled workers that need to be filled by qualified foreign workers. "Companies such as Microsoft, Cisco, Amazon.com, Texas Instruments, Oracle Corp. and Intel have taken their claims of a labor shortage to Congress" (Watts 2001, 145) arguing for an increase in the H-1B visa ceiling. On the other hand, unions, employee organizations, and independent research argue such claims of an industry shortage are false – the claims made by the IT industry are rooted in a quest for cheap labor.

The U.S. Economy Needs Highly Skilled Foreign Workers

For high-tech industries, foreign-born workers holding H-1B visas are a critical labor pool. Some arrive as students, some as workers, and many attempt to become permanent residents. Advocates for an increase in the H-1B visa ceiling have projected job growth, expressed a need to fill employment vacancies as part of an ultimate argument for maintaining the competitiveness of America's high-tech industry. These same advocates argue that foreign highly skilled workers have consistently contributed to the economy. A Harvard Business School study noted that immigrants not only comprise a significant number of scientists and engineers in the U.S., but there is also a strong correlation between the number of inventions, measured by patents, which increased when H-1B caps were raised, due to the direct contributions from highly skilled foreign workers (Kerr and Lincoln 2008, 1).

These same advocates, information technology (IT) companies and business associations, point to the relationship between H-1B workers and job creation. IT companies, employee associations and lobbyists suggest that, rather than substituting for native-born workers, foreign talent complements native workers and increases employment opportunities in the U.S. The National Foundation for American Policy (NFAP) found that for every H-1B visa position requested, U.S. tech companies increase their employment by five workers on average the following year (National Foundation for American Policy 2008). For companies with fewer than five thousand employees, each H-1B visa requested was associated with an increase of employment of seven and a half workers (National Foundation for American Policy 2008, 11). The NFAP also found that in response to lowering the H-1B visa cap, sixty-five percent of the 120 technology

companies surveyed admitted to moving more of their work outside of the United States to countries where more workers better suited to meet the specific job qualifications could be found (The National Foundation for American Policy 2008, 2). The Government Accountability Office also found a number of IT firms placed employment candidates overseas “temporarily” in response to H-1B visa caps (U.S Government Accountability Office 2001: 23, 24). America’s leading IT companies claim that:

“Failure to increase the H-1B cap and the limits that will place on the ability of American companies to grow and innovate will also limit the growth of jobs available to American workers. Failure to raise the H-1B cap will aid our foreign competitors by limiting the growth and innovation potential of U.S. companies while pushing talented people away from our shores. This could mean a loss of American’s high technology leadership in the world” (Senate Judiciary Committee Report 2000).

These companies and policy advocates maintain that the entire U.S. economy could suffer as result of continued limits on the H-1B cap as it stands today because the IT industry claims to influence almost every segment of the economy – from banking, insurance, manufacturing, retail, education, to government (Watts 2011, 150).

The Need for Highly Skilled Workers is exaggerated

The claims made by the IT industry, portraying a severe need for highly skilled foreign workers are criticized as “biased and irrelevant” by employee associations and labor unions (Watts 2011, 150).

“Allegation of major shortages of IT skills are greatly exaggerated and largely unsupported by objective economic measures. Alarmist claims

that our nation faces an extreme shortage of highly skilled and professional workers to serve its growing IT-based industries rest on studies initiated and supported by the very employers who stand to gain the most from an oversupply of IT workers” (AFL-CIO Executive Council Statement, 20 March 1998).

Opponents claims of IT labor shortages and H-1B visas fostering job creation point to numerous arguments to refute those claims, ranging from layoffs among older IT workers, low hiring rates, a leveling in wage growth, and a recent increase college enrollment and graduation in majors associated with the IT industry (Watts 2011). Older IT workers are laid off and replaced by contract workers partly due to the short life span and product cycles in the IT industry, which needs employees who are up-to-date with the latest technology and advancements. Recruiting workers focuses largely on those with new skills, rather than maintaining older workers with talent, or investing in older workers with continued education. Opponents of increasing the pool of H-1B visa workers argue more should be done to retain older workers, thus reducing the demand for new workers and claims of labor shortages.

In rebutting claims of labor shortages, opponents of the IT industry claim that employers are extremely selective, and as consequence, job vacancies are high. Requiring job applicants to have experience with the very latest software and technology eliminates a number of seasoned American workers in favor of recent graduates. In addition, due to the short product life span of tech and internet products, job turnover rates are high in the IT field, which dictate how fast companies grow or not.

To conclude, there are problems characterizing a shortage of IT workers, short term or long term. First, determining what skills and qualifications IT workers must

possess in order to be defined as such is complicated. IT workers include numerous occupations, from “computer support specialists, database administrators, webmasters, systems analysts, computer programmers and computer engineers” (Watts 2011, 145). Second, “episodic demand” skews long-term forecasts of industry needs, just as rapid job creation, and rapid turnover, both characteristics of high-tech industries, result in hiring workers with knowledge of the latest technologies rather than retaining older employees. Understanding just how many college graduates will enter the IT industry further complicates forecasts of the future of America’s high-tech industries when potential workers are “not only computer science majors, but may also include business, science, engineering and non-technical majors” (Watts 2001, 146).

Economic Demand for Highly Skilled Immigrants

Highly skilled migration facilitates global interaction and integration, accelerating the development and strengthening of financial ties among countries. Globalization also affects the variations in high-skill migration to advanced countries, particularly the United States. In the United States, the demand for highly skilled workers continues to increase as the relative skill levels of native workers decline. Highly skilled foreign workers have often been acknowledged for significant contributions to research and the development of innovative patents, one merely needs to examine the list of Nobel laureates and inventors who have immigrated (Endleman and Loughran 1998, Hirschman 2005). This section of the paper seeks to assess the importance of economic contributions

of highly skilled immigrants to the U.S. economy with special regard to skilled positions and evaluates the need for continued highly-skilled immigration.

In 2009, almost 15 percent of U.S. workers were born outside of the United States. There are remarkable differences in skill, education, and labor characteristics of these migrants. Migrants from Latin America are over-represented in low-skill jobs and “elementary” or “high education without diploma” levels. In comparison, Asian and European counterparts are heavily represented at both higher education levels. Asians (immigrants from China, Japan, and Korea) account for 46 percent in professional jobs in 2006, while only 13 percent were from Latin America (Lee and Mather 2008).

Table 1. Share of Foreign-Born Population in Professional Occupations, by Region of Birth, 2006



Low-skilled foreign-born workers are mainly over-represented in the agricultural, construction, and manufacturing sectors. Highly skilled migrants account for only a fraction of the total composition of the migrant labor force, but are in greater demand

because their abilities and talents create new opportunities and increase economic competitiveness. Foreign-born scientists and engineers drive American innovation and job creation. In 2008, the Harvard Business School released statistics indicating that immigrants comprise nearly half of all scientists and engineers in the U.S. and accounted for 67 percent of the increase in science and engineering workforce between 1995 and 2006 (Kerr 2008). The same study revealed a distinct correlation of the contributions made by migrant inventors and innovation patterns, measuring the number of patents compared with the number of immigrants entering the country on H-1B visas for high-skilled foreigners. Although the labor market's demand expands and contracts with the demand for highly skilled workers in general, the demand for these workers outstrips the number of visas issued per year.

Permanent employment based migrants are divided into five preferential groups, each subject to numerical limitations, 140,000 admitted each year. Forty thousand are reserved for foreign skilled workers recognized as most valuable, whom are "persons of extraordinary ability" including those in arts, science, education, business, or athletes, professors and researchers, and some multinational executives (Immigration Policy Center 2010). Another 40,000 are reserved for the second most valuable category of employment-based migrants, including professionals holding advanced degrees or possessing "exceptional abilities" in the arts, science, or business. The remaining visas are reserved for skilled shortage workers, or professionals with degrees and "other" workers for unskilled labor that is not seasonal or temporary. Non-permanent visas are also provided for "special immigrants" such as religious workers and U.S. Government and Foreign Services personnel. Persons who intend to invest \$500,000 or \$1 million in a

job creating enterprise that will hire ten or more workers are also given preference. The coveted supply of H-1B temporary visas for high-skilled workers, capped at some 65,000 annually (after unused visas from the fourth and fifth category preferences), with 20,000 reserved for foreign students at American universities, is exhausted by the first day of each fiscal year since 2004 (Immigration Policy Center 2010).

As of 2008, there were more than 140,000 job openings for skilled positions in companies listed on the S&P 500. American companies lack access to the skilled professionals needed to help stimulate economic growth, with demand most pronounced in technology and defense companies (National Foundation for American Policy 2008). This is a trend with long-term implications, especially if companies like these cannot fill positions requiring skilled labor of all kinds. The same NFAP Policy Brief noted the Trade Association TechNet reported some 18,816 job openings, The Information Technology Council reported 21,912 openings, and the American Electronics Association noted some 12,784 available jobs in 2008 (see figure 3).

30 U.S. Companies With Most Job Openings for Skilled Positions (U.S.)

Company	Industry	Skilled U.S. Job Openings January 2008
1) Microsoft Corp.	Systems Software	4005
2) Northrop Grumman Corp.	Aerospace & Defense	3925
3) Lockheed Martin Corp.	Aerospace & Defense	3901
4) General Electric	Industrial Conglomerates	3078
5) Countrywide Financial Corp.	Thriffs & Mortgage Finance	2415
6) JPMorgan Chase & Co.	Other Diversified Financial Services	2164
7) Tenet Healthcare Corp.	Health Care Facilities	2050
8) United Health Group Inc.	Managed Health Care	1927
9) Raytheon Co.	Aerospace & Defense	1694
10) International Bus. Machines	Computer Hardware	1670
11) Computer Sciences Corp.	Data Processing & Outsourced Services	1666
12) Cintas Corporation	Diversified Commercial & Prof. Services	1664
13) L-3 Communications Holdings	Aerospace & Defense	1618
14) Bank of America Corp.	Other Diversified Financial Services	1600
15) U.S. Bancorp	Diversified Banks	1562
16) Cisco Systems	Communications Equipment	1504
17) Johnson Controls	Auto Parts & Equipment	1484
18) Wachovia Corp.	Diversified Banks	1455
19) Citigroup Inc.	Other Diversified Financial Services	1437
20) Automatic Data Processing Inc.	Data Processing & Outsourced Services	1421
21) Hewlett-Packard	Computer Hardware	1398
22) Time Warner Inc.	Movies & Entertainment	1329
23) Comcast Corp.	Broadcasting & Cable TV	1237
24) Johnson & Johnson	Pharmaceuticals	1206
25) Oracle Corp.	Systems Software	1200
26) United Technologies	Aerospace & Defense	1130
27) Cardinal Health, Inc.	Health Care Distributors	1062
28) Electronic Data Systems	Data Processing & Outsourced Services	981
29) Affiliated Computer	Data Processing & Outsourced Services	941
30) Google	Internet Software and Services	922

Sources: National Foundation for American Policy; detailed analysis of S&P 500 company websites. Job Openings counted for positions in the U.S. requiring a B.A., professional degree or greater, January 2008.

Figure 3. Thirty U.S. Companies with Most Job Openings for Skilled Positions (U.S.)
Source: National Foundation for American Policy

Long-term stagnation in U.S. skill levels relative to the rest of the world does not bode well for the future of the American economy, nor its edge in technological innovation. “America in the 21st Century is no longer a skill-abundant country relative to an increasing share of the world” (Kirkegaard 2008). The baby boomer generation, supported by the best skill sets in the world during the time they entered the workforce,

are retiring. As a consequence, the U.S. is subject to skill drain because younger Americans replacing them are no longer the best and the brightest in the world, having little or no competitive edge over young workers from other countries. The National Science Foundation warns, “the rate of growth of the science and engineering labor force may decline rapidly over the next decade because of the aging individuals with science and engineering educations, as the number of science and engineering degrees reaching traditional retirement ages is expected to triple. If this slowdown occurs, the rapid growth in R&D development and spending that the United States has experienced since World War II may not be sustainable” (Regets 2007). If the United States cannot successfully attract foreign skilled laborers, especially migrant scientists and engineers, the growth rate of various technological sectors of the economy may reduce significantly. As entry into the United States becomes more difficult, other countries are reducing barriers and introducing incentives for highly-skilled migrants entering the global labor market. In order to maintain competition in the global market, reform or reassessment of current immigration policy may be necessary.

Higher Education in America

The United States has traditionally been the largest receiving country for immigrants, especially international highly skilled migrants and foreign students. This section will explore the following questions illustrate America’s role in attracting educated and highly skilled laborers and emphasize our dependence on keeping them here: Why is American education valuable or most attractive? Why does the United

States depend on foreigners to pursue specific post-secondary degrees and fulfill specific areas of labor? Are other countries becoming more competitive in regards to post-secondary education and education opportunities? Understanding these factors related to the changes and magnitude of such immigration can provide insight for the future of American leadership in technological innovation and the future of our economy.

In 2007, data from the Trends in International Mathematics and Science Study (a standard for comparing countries across the world) revealed American students are in the “middle of the pack” (Toppo 2007). In eight-grade math, countries such as Singapore, Korea, Taiwan, and Japan outperformed American students. Overall, the United States fared better than developing countries: Morocco, Tunisia, and Armenia but lagged behind Holland, Japan and Singapore. Fourth-graders in Singapore, Hong Kong, Taiwan, Japan, Kazakhstan, England and Russia outperformed their American counterparts. The key factor the United States educational system should focus on is improving the quality of education across the board to improve overall averages when compared to European and Asian counterparts.

The United States is the largest educator of foreign students. The numerous advantages an American education provides are deteriorating quickly as the scientific and technological gap with the rise of the rest of the world has narrowed. In 2005, the National Academy of Sciences released a report forewarning the United States that it would soon lose its position as the world’s leader in science (Zakaria 2011, 203). General statistics seem to reveal dire implications for the future of technological innovation in the United States. In terms of cost, for one American chemist or engineer, companies can hire five educated Chinese or eleven Indian scientists or engineers, and this practice

drives wages down (Zakaria 2007, 204). The same report indicated finding of some 600,000 Chinese graduates and 350,000 Indian engineering graduates in comparison with a dismal figure of some 70,000 American engineering graduates. However, these figures are grossly exaggerated, and upon closer examination, indicate that graduates of technical two or three-year programs are taken into consideration and given full weight when calculating graduate total statistics in science and engineering in China and India. This would suggest a portion of those graduates is not necessarily of the same academic classification as American graduates. Thus, the focus shifts to the *quality* of these graduates and their actual high skill projection, not how the figures of how many engineers and chemists Asia is producing. Zakaria commented that, “even this number is significantly inflated by different definitions of “engineer” that often include auto mechanics and industrial repairmen (Zakaria 2011). Carl Bialek, a Wall Street Journal reporter, noted figures indicating that China only granted in total about 200,000 science and engineering degrees per year and 120,000 to 130,000 engineering degrees were awarded in India, still more than the United States (Bialek 2005).

With five percent of the world’s population, the United States dominates higher education, having 74 or 75 percent of the world’s top 50 universities, making higher education the United States’ best industry (Zakaria 2011). The Organization for Economic Cooperation and Development released a report ranking universities on a global scale, and “overall, 40 of the top 50 are located in the United States” (OECD 2009). The report notes there is “growing evidence” that indicate Asian universities are beginning to emerge as innovative research institutions (OECD 2009). It is unlikely Asian institutions and universities will improve quality to match that of research

institutions and universities in the next few decades. The United States leads the world in research and development, investing some four hundred billion dollars per year (OECD 2009). It remains the most popular destination for international students, and nets 30 percent of international students annually (Zakaria 2011). Native-born Americans graduate more with non-technical degrees, as business, social sciences, and health professions are the most popular degrees earned in the United States (see figure 4). Thus, the need to attract foreign students and foreign skilled labor within the fields of science, engineering and technology increases greatly.

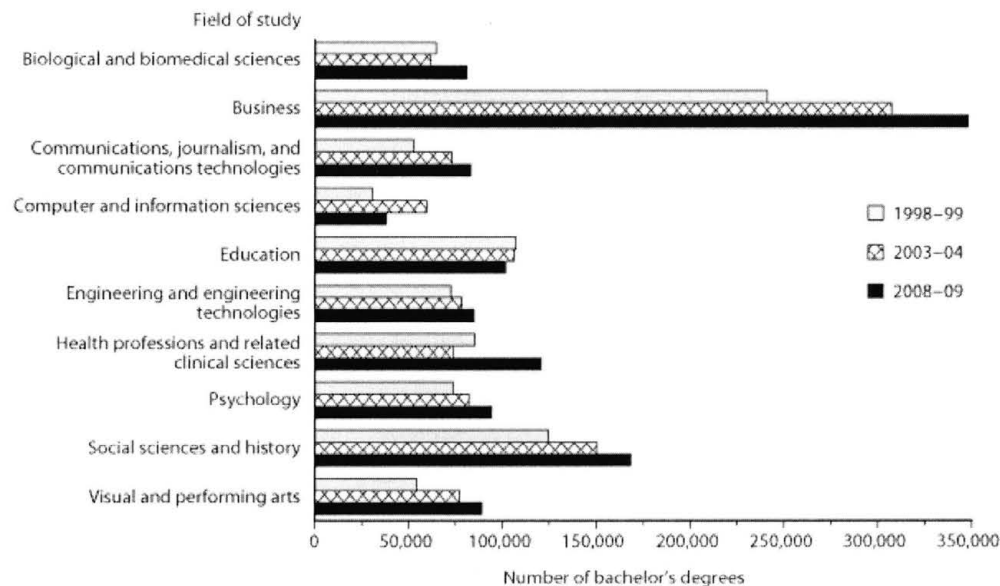


Figure 4. Bachelor's Degrees Conferred by Degree-granting Institutions to Natural Born American Students in Selected Fields of Study: 1998-99, 2003-04, and 2008-09

Source: IES, National Center for Educational Statistics. Source: U.S. Department of Education, National Center for Education Statistics, 1998-99, 2003-04, 2008-09 Integrated Postsecondary Education Data System "Completions Survey" (IPEDS-C: 98-99) and Fall 2004 and Fall 2009.

The United States recruits science and engineering candidates from three main sources: U.S. natural-born degree holders, international students whom graduate and stay on in the United States after graduating, and immigrants abroad that have already

obtained science and engineering degrees, seeking employment (Freeman 2006). This is especially true for foreign students and workers from developing countries in which employment opportunities, economic outlook, and science and research facility qualities (and even accessibility) are lower compared to that of the United States. Foreign students and highly skilled laborers are attracted to the United States for educational and employment opportunities in science and engineering due to the associated benefits of migrating – higher incomes, greater employment opportunities, green cards and visas, and citizenship. These opportunities are far more attractive in the United States than the immigrants' home countries.

Immigrants comprise a significant portion of minority scientists and engineers in the United States. The National Science Foundation released an information brief in 2007 indicating 3.3 million immigrants are apart of the 21.6 million scientists in the United States (Immigration Policy Center 2010). Research indicates a majority of immigrant scientists and engineers come from all regions of the world, with a high concentration of 1,873,000 from Asia alone. India, China (Hong Kong and Macau included), Philippines, Canada, United Kingdom, Korea, and Taiwan are the major resource countries from which these high skill workers originate (Immigration Policy Center 2010). Most immigrant scientists and engineers either completed all of their degrees in the United States, like Canada and Korea, or all of their degrees abroad, as India, Philippines, United Kingdom, and Taiwan (NSF, see table 2).

Table 2: Birthplace of Immigrant Scientists and Engineers, by Region and Other Characteristics: 2003

Characteristic	(Percent)									
	Immigrants by place of birth									
	Native-born U.S. citizens	All immigrants	Asia	Europe	South America	Caribbean	Africa	North America (except U.S.)	Central America (including Mexico)	Other ^a
All scientists and engineers (n)	18,295,000	3,352,000	1,873,000	632,000	179,000	170,000	167,000	156,000	145,000	31,000
Age at first entry for 6 months or longer (years)										
Younger than 18	na	23.6	19.4	26.6	25.6	45.4	13.5	31.2	40.2	22.5
18–34	na	62.8	69.3	52.4	62.7	42.3	70.4	53.7	50.5	60.3
35 or older	na	13.6	11.3	21.0	11.7	12.3	16.2	15.2	9.3	17.2
Year of first entry for 6 months or longer										
1993 and earlier	na	75.3	74.1	76.0	76.0	87.5	74.2	69.1	81.2	73.9
1994–2003	na	24.7	25.9	24.0	24.0	12.6	25.8	30.9	18.8	26.1
Place of postsecondary education										
All degrees earned in U.S.	99.2	38.7	34.0	36.9	44.6	71.0	43.7	44.7	49.8	43.5
Degrees earned abroad and in U.S.	0.5	18.7	24.3	10.7	13.4	6.1	17.4	13.4	10.6	16.3
All degrees earned abroad	0.2	42.6	41.7	52.5	42.1	23.0	38.9	41.9	39.6	40.1
Highest degree of educational attainment										
Bachelor's	60.5	51.1	49.9	45.7	58.6	58.2	53.8	58.0	62.8	49.9
Master's	27.1	30.2	32.1	31.7	26.6	25.8	26.9	21.4	23.1	22.4
Doctorate	3.9	9.4	9.1	13.6	6.2	3.0	11.1	8.4	3.5	22.8
Professional	8.5	9.3	8.9	9.1	8.7	12.9	8.3	12.2	10.7	4.9

Source: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT): 2003.

These figures indicate the relative attractiveness of post-secondary education institutions in nations abroad and provide insight as to why the United States receives more educated and high skilled migrants from certain countries over others. Countries sending the most science and engineering students and workers have fewer opportunities for higher education that match the quality of leading institutions in the United States (in addition to other factors, such as economic, social and political considerations). The age group most represented at first entry into the United States is the 18-34 age group, as 39 percent cited educational opportunities as the main reason for immigrating (National Science Foundation 2007). Those who come to the United States to study are more likely to stay to find gainful and purposeful employment within the United States rather than return to their home countries.

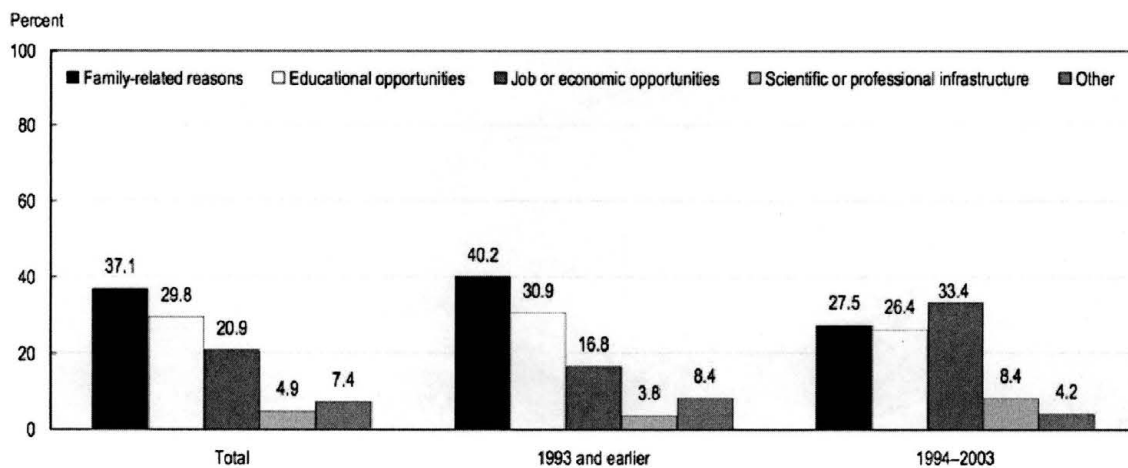


Figure 5. Most Important Reason Given by Immigrant Scientists and Engineers for Decision to Come to the United States, by Year of First Entry: 2003 NOTE: Respondents were asked when they first came to the United States 6 months or longer

Source: National Science Foundation, Division of Science Resource Statistics, Scientists and Engineers Statistical Data System (SESTAT) 2003.

Reasons for migrating differ by areas of birth, as individuals from almost all regions during 1994-2003 cited employment and economic reasons as the main motivation to immigrate to the United States. Before the mid-nineties, family related reasons were the most commonly cited as reasons for immigration. Migrating scientists and engineers from Europe, North America (excluding the United States) and Central America (including Mexico) cited family-related reasons for coming to the United States in rather large percentages - over 40 percent surveyed from those specific areas. These regions also indicated low percentages of immigrants citing educational opportunities as main reasons for immigrating – only 15.2 percent of Europeans migrate to the United States to study. In comparison, 35 percent of migrants from Asia, Africa and South America indicated educational opportunities as the main reason for immigrating to the United States. Not only are the educational opportunities attractive to foreign students, but also the possibility and promise of finding gainful employment in the United States.

That is why these students are not only applying to the best universities in the U.S., but are flocking to American universities and colleges in general, as they are seen stepping stone into new employment opportunities in the United States. Enrollment of foreign students is a critical component of America's hopes of maintaining a leading position in technological innovation and advancement, especially as long as American students continue to pursue degrees unrelated to the sciences and technology.

The debate surrounding highly skilled migration appears to be exaggerated by some, understated by others, and in general, based on information that can be easily misconstrued to suit either side. What is relevant to both sides of the argument is the need for foreign highly skilled workers and students to fill in the gaps in both industry and education. There are benefits and costs to highly skilled migration, but regardless, it is no less important for the United States to consider revising and updating immigration policy to meet the needs of maintaining American technological competitiveness on a global scale.

CHAPTER IV

FACTORS UNDERLYING HIGH- SKILLED INTERNATIONAL MIGRATION

Governments and businesses alike have always recognized the value of highly skilled individuals as a source of innovation, competitive advantage and economic growth over other countries and firms. Constraint on the movement of these highly valued individuals has affected their accessibility and distribution throughout the world, as the impact of international movement of populations continue to change and influence the patterns of global development. The number of highly skilled migrants has increased over time, the result of policies pursued by OECD member countries in the 1980s and 1990s that were considered “quality-selective,” resulting in the use of point systems, worker visas, and blue/green cards. Between 1990 and 2000, highly skilled migrants living in OECD countries increased 70 percent, accounting for some 90 million highly skilled migrants of the 180 million immigrants worldwide, (Doquier and Rapoport 2007). A whopping 35 percent of skilled migrants came from Asia, followed by other OECD countries and Latin America. Economic opportunities alone do not influence individuals’ reasons for migration, as there are other influences that help form persons decisions to emigrate. Major theories have been developed to help explain various aspects of international migration, and a brief discussion will explore varying theories in order to understand the motivation for movement of highly skilled immigrants, and the role of human and social capital and in terms of value for both receiving countries and

immigrants, and the importance of reception to the U.S.

Contemporary Migration Theories

International migrants are typically influenced by political and social factors and possible opportunities in making decisions to migrate. John R. Weeks (2010) has identified two important elements in explaining contemporary migration: first, the creation of new opportunity structures, highlighting the benefits and pull factors of immigration, and push factors that undermine the existing relationships between people and local resources. The second element is the development of cheaper and quicker communication and transportation, making it easier to migrate and return home and learn about potential destinations for migration (Weeks 2010). Building upon these two elements, two migration strategies set the foundation for patterns of migration. Step migration refers to persons whom “inch” away from home to larger cities and further onto greater distances to minimize risks of migration. Chain migration establishes flows of migration to a common origin to a destination already settled by earlier migrants, creating communities and enclaves.

Step migration and chain migration are two strategies that identify patterns of movement, but do not answer the question *why* people migrate internationally. Several popular theories examine the initiation of migration: neoclassical economics, new household economics of migration, dual labor market theory, and world systems theory. Other theories explain the perpetuation of migration: network theory, institutional theory, and cumulative causation.

Initiation of Migration Theories

The neoclassical economics approach (Borjas 1990) is based on the belief that migration occurs due to labor adjustment caused by geographic differences in the supply of and demand for labor. At the individual level, the Neoclassical theory of migration is seen as an investment in human capital as people chose to migrate to places where the greatest opportunities exist. The New Household Economics (Stark, Taylor, and Yitzhaki 1986) of migration theory explains how decisions about migration are reached in the context of what is best for the entire family or household in terms of maximizing income, reducing risk, diversifying income and facilitating the flow of remittances sent home. Dual labor market theory (Piore 1979) distinguishes two kinds of markets that dictate the initiation of migration: the primary market, which employs well-educated persons, pays well, and offers job security, The secondary market offers low wages, unstable working conditions, and lack of advancement. Historically, the secondary market was occupied by women and racial/ethnic minority groups, but now migrants from developing countries generally fill secondary market positions. World Systems theory (Wallerstein 1974; Portes and Walton 1981; Sassen 1988) is based on the notion that the world market developed into a set of core nations, possessing capital and material wealth, and peripheral nations, dependent on the core. Countries are most likely to send immigrants to core nations with which they have the strongest ties – whether they are economic, political, or military (Weeks 2010).

Perpetuation of Migration Theories

Network theory argues that migrants establish interpersonal ties that “connect

migrations, former migrants, and non-migrants in origin and destination areas through ties of kinship, friendship, and shared community origin. They increase the likelihood of international movement because they lower the costs and the risks of movement and increase the expected net returns to migration” (Massey et al. 1993). Institutional theory describes the perpetuation of migration by institutions that develop precisely to facilitate and profit from the continued flow of immigrants. The theory of Cumulative Causation explains how each act of migration changes the likelihood of subsequent decisions about migration because migration has an impact on the social environment in both the sending and receiving regions (Weeks, 2010).

For the purpose of this thesis, the theories of the perpetuation of migration are important in framing the context of reception in regards to attracting and keeping highly skilled workers in the county and will be revisited in later portions of this work.

Human Capital and Social Capital

To understand why continued highly skilled migration to the United States is important to maintaining a competitive advantage in the global realm of scientific and technological innovation, it is necessary to conceptualize capital in terms of human capital and social capital. Human capital and social capital help to explain why highly skilled migrants are valued by governments and economies, and how highly skilled immigrants find value in migrating to foreign countries. Capital is an asset for which an economic return is captured, and takes various forms – financial, human, and social (Sage E-Reference 2012). A brief discussion of both human and social capital will provide

conceptual context for examining various factors that contribute to the flow of foreign highly skilled migration to the United States.

Human capital is composed of an individual's knowledge and skills. Mental and intellectual abilities, communication skills, motivation, and information processing all contribute to the development and formation of human capital (Sage E-Reference 2012). Specific features of human capital distinguish it from other forms of capital – in particular, human capital belongs entirely to the individual, and freedom of choice to use or share human capital is at the discretion of the individual. In addition, human capital is mobile, a unique aspect that can create a temporary or permanent asset for any firm or organization, and can travel distances great or small (Sage E-Reference 2012). Mobility is a feature that contributes to human capital as a source of competitive advantage. The ability of firms and organizations to attract and capture individuals, both native and foreign-born alike, with high levels of human capital will, in effect, allow them to maintain a competitive advantage. Innovation occurs when individuals engage in sharing and cultivating intellectual dialogue to form new knowledge.

In comparison to human capital, social capital describes aspects contributing to migration based on networks, social trust and norms that provide opportunities for the exchange of information and ideas. "Like any other form of capital, namely, physical or human – social capital aids future productivity of individuals and groups in civil society, though not mainly economically" (Farr 2004, 9). The development of social capital theory is rooted in the works of notable thinkers such as Marx, Weber, Simmel and Durkheim). Academic pursuits in the 1980s and 1990s led to a renewed scholarship as James S. Coleman and Robert Putman garnered attention with their contemporary notions

of social capital theory, finding popularity with both academic and popular audiences.

Coleman described social capital in terms of relationships and interplay within networks, social trust and norms, the fundamental pillars underlying social capital (Coleman 1990). He used a series of examples focusing on groups of people who had established social capital through networks, which provide opportunities to exchange information that drives favorable outcomes and is strengthened when social trust provides credibility and confidence necessary to facilitate the exchange of information. The sharing of information and opportunities in groups of people establishes norms and social patterns for the control of expected and desired behaviors within a specific group (Putnam 1995). Putnam similarly adopted Coleman's defining characteristics of social capital, explaining how trust, norms, and networks improve the efficiency of society by facilitating coordinated actions. The more recent contributions of Coleman and Putnam includes Sandefur and Lauman's 1998 research, which examined benefits of social capital with regards to information, influence and control, and social solidarity, to Astone et. al. (1999) who maintained the belief that social capital is an extension of social exchange theory and that social capital is the feature of an individual and not a group, leading to further research on the private and public affects of social capital.

Human capital and social capital contribute to foreign migration in many ways. The demand for human capital resources impacts the growth and development of social capital within migrant communities and ethnic enclaves in the United States. The accumulations of both these types of capital encourages and maintains foreign highly-skilled migration to the United States.

How Social Capital Works

Several examples illustrate how social capital in America functions across different migrant communities in varied manifestations, including, but not limited to: religious affiliation, governmental institutions, and social networks. According to Spener (2009), social capital operates on many levels, based on numerous factors: value, in which resources are transferred from one member of a group to another; a bounded solidarity in which members extend their resources to other members of the group because of a identifying strongly with a specific group; reciprocity, sharing resources expecting everyone to do the same at any point in time; and lastly, enforceable trust, in which members of the community share resources on the expectation of reciprocity, which will occur within the group on members who do not fulfill their the expectations of the social group (Spener 2009). The following examples illustrate the function of social capital in attracting migrants to the United States.

Religious affiliation has often acted as a source of social capital in the United States. While there is no singular or comprehensive theory regarding immigrant churches in the United States, there are some general conclusions. For immigrants, religion often becomes a way of life, and migrant participation in churches becomes more intense in their new country than in their old (Hurh and Kim 1990). “Participation brings meaning, belonging, and comfort,” and recent immigrants often seek to form bonds similar to those in their former communities, villages, and neighborhoods (Hurh and Kim 1990, 22). Church affiliation often promotes “mobility and assimilation,” but also “enhances ethnic

cohesion and identity of immigrants,” (Hurh and Kim 1990, 23).

The Korean migrant population in the United States manifests the attractive pull of ethnic churches in promoting social capital. Korean religious participation in the United States is greater than any other Asian group other than the Filipinos. A majority of Korean migrants came to the United States after 1965 after major changes in the U.S. immigration system and were primarily students and professionals, eventually bringing their entire families to the United States. The substantial and consistent flow of Korean migrants has accelerated the growth rate of the Korean population, growing “27-fold between 1970 and 2007, from 38,711 to 1 million, making them one of the largest recent immigrant groups in the United States (Terrazas 2009).

The Asian-Indian immigrant community in the Dallas Fort-Worth area serves as a example of how social organizations have emerged over the last twenty years to create strong connections among the Asian Indian community. These are not centered on religion or economics, but rather, inclusion into both the Asian-Indian and American communities. Asian Indians are a very diverse population and speak a broad range of regional languages (Bengali, Gujarati, Kannada, Konkani, Malayalam, Marathi, Punjabi, Tamil, and Telugu), and are followers of a variety of religious traditions (Hinduism, Islam, Jainism, Sikhism, Zoroastrianism, Christianity) (Brettell 2005). The many organizations the Asian-Indian immigrant community formed reflect a number of different identities in different contexts – Americans, Asians, Indians, South Asians, Gujaratis, Bengalis, Muslims, Christians, and Hindus.

Among the Asian-Indian religious and economic organizations representing a

broad range of ethnic identities, the need to demonstrate a partnership among the various cultures was discussed throughout the vast community. A center for community events and the showing of Bollywood movies became the focus of such a center. Financial contributions of \$1,000, collected from forty founding directors, assembled “credible representatives from every segment of the community – Hindus, Bahai, Muslims, Pakistanis, political organizations, religious organizations, etc. (Brettell 2005). The center, FunAsia, opened in December of 2002 and aimed to satisfy three main elements:

“First, the center would be a “silk road,” introducing South Asian culture to the mainstream. Second it would be a safe and shiny place for the younger generation. South Asians are concerned about their children. They put restrictions on them and then the kids ask where they can go. FunAsia would be a safe place where they could bring their friends and introduce them to their culture... And third, it would be a place to bring the community together regardless of religion, race, or national background. It would be a place where the differences would be eliminated so that the South Asians could focus on their commonalities. They could all be part of one picture and understand their shared South Asian culture.” (Brettell 2005, 869).

The difference between FunAsia and other religious and economic organizations is the desire for FunAsia to reach out to the surrounding communities in addition to the numerous South Asian communities the center hoped to connect. The center is open to a number of other events such as weddings, quinceaneras, diawali, and birthday and graduation parties (Brettell 2005).

The social organizations discussed in this section of the paper – ethnic Korean churches, Filipino membership in the military, and the Asian-Indian cultural center cultivate a sense of belonging, foster interaction, and facilitate communication among

settled and newly arrived immigrants. These networks have strengthened immigrants' social capital, reinforcing pre-existing identities and form new identities allowing migrants to assimilate into the new cultures that exist with their own, and at the same time, create an atmosphere more conducive for further immigration (Portes and Zhou 1994).

Reception

Relative to both human capital and social capital is a third and critical factor contributing to the function of the flows of highly skilled migrants: receptivity. The success of highly skilled migration flows depends on the “nature of integration of skilled migrants into destination economies” (Iredale 2001). Portes and Borocoz (1989) explore how the incorporation of professional people, technical workers and students depend on their reception at the destination country, characterizing reception in three modes: “handicapped,” “neutral,” and “advantaged,” (Portes and Borocoz 1989). “Handicapped” or disadvantaged reception includes “unfavorable official reception, closed shop practices of trade unions, race discrimination or lack of legal status and end up as ghetto service providers, unemployed, etc.” Neutral reception incorporates workers at acceptable levels into the primary market, while immigrants poised with advantage experience upward mobility to aspire to civic leadership (Iredale 2001).

Understanding reception is essential in examining how highly skilled immigrants are welcomed to the United States, and how continued levels of immigration are maintained. The level of reception of highly skilled immigrants has affected the

distribution of highly skilled migrants and growth and development of cities and regions, and has been examined over the last six decades, recognizing the role of cities in attracting educated people (Jacobs 1961), the role of human capital contributing to regional development and economic growth (Ullman 1958; Glaeser 1998, Glendon 1998 and Simon 1998), and the connection between regional innovation with openness to diversity and talent (Florida 2001). Florida demonstrated the “economic geography of talent is associated with diversity or openness,” what he considers “low barriers to entry for human capital” (Florida 2001, 32).

The labor market acts as a component of reception, as “labor markets vary along several dimensions, including not only the size of immigrant segments and niches, but also overall employment regimes and industrial relations processes, earnings dispersions, gender inequalities, career structures and unemployment rates” (Reitz 2002, 9). These dimensions frequently interact, and thus, need careful consideration in terms of receiving migrants, especially in the context of demand for labor and laborer type (low skilled or high skilled). Receiving countries’ societal expectations, characteristics, and impressions of immigrants contributes to varying reception for a wide array of cultures. Reception often has an impact among self-employment rates among migrants, as Reitz (2002) argues “immigrant entrepreneurs thrive in an environment of institutional individualism, open to immigration, an unregulated market economy, and weak welfare state” (12).

Governmental and public policy affects the reception of migrants in numerous ways, the most obvious being immigration policy and citizenship. The selection of migrants for entry is “an important determinant of the character of immigrant populations and communities” (Reitz 2002, 12). Programs to assist with immigration settlement,

assimilation and integration are widely offered in forms of language training, interpretation services, job counseling, employment assistance, healthcare, and housing benefits, and other forms of assistance among other welfare-based programs as initial methods of reception. The formation of immigrant communities and enclaves promote continued migration. Workers who experience relative success or opportunities in both the economic and social realms in a host country establish networks of support and assistance for newcomers. The relative success and development of migrant communities allow for continued migration based on reputation on a reception at the destination point.

CHAPTER V

THE INTERNATIONAL RACE FOR TALENT

As more competitors for the highly skilled migrants enter the global race for talent, each country or government has attempted to develop selective migration policies to attract knowledgeable migrants to further boost technological innovation in their countries. As result, countries are trying to outbid each other in an effort to attract highly skilled migrants by offering incentives to compete with other nations. Thus, as countries formulate new immigration policies, there are more destination choices to choose from, all eager to attract talented migrants. In order to view the scope of global competition the United States faces in attracting highly skilled immigrants, an overview of immigration policies throughout the world will put into context the position the U.S. may find itself in the coming years in regards to maintaining its edge in attracting highly skilled immigrants from around the world.

In order to compete with the United States, countries such as Canada and Australia introduced open and fast paths to naturalization. In the 1960s, shortly after the U.S. passed monumental immigration legislation, Canada adopted a “point system” of immigration policies in an attempt to attract highly skilled migrants; Australia and New Zealand followed suit. More recently, European countries, France, Germany and the United Kingdom, have adopted less stringent admission policies for highly skilled workers. Asian countries, including Singapore, Taiwan, and South Korea, have actively

begun to recruit highly skilled workers as well, often trying to lure back highly skilled émigrés (Shacar 2006).

Providing citizenship for highly skilled migrants has become a central component in the global race for talent. Highly skilled migrants are not only seeking opportunities in new destinations but are also motivated to seek security in these opportunities.

Citizenship has become an important factor in recruiting talent. Many highly skilled workers are not only interested in employment opportunities, but also the chance to allow their families to enjoy the “security and prosperity that is attached to membership in a stable, democratic and affluent polity” (Shacar 2006, 117) permanently, as opposed to temporary status as a guest worker.

As discussed in earlier sections of this thesis, the United States began actively recruiting highly skilled immigrants in 1965, passing amendments to facilitate the flows of qualified foreign immigrants with exceptional abilities and desired skills. The passage of such amendments established a individual worker and job evaluation system, matching highly skilled immigrants with specific jobs on a case by case process. Unlike the United States, Canada introduced a point system, where by potential candidates for admission are evaluated according to “certain human capital characteristics deemed to advance the host country’s interests” (Martinez-Herrera 2008, 2). The point system served as a selective immigration policy designed to attract and admit highly skilled immigrants that may contribute to Canada’s technological competitive edge. Under the point system, each applicant is assessed in a number of categories: education, language proficiency, work experience, age, arranged employment in Canada, and “adaptability” – recognizing past studies or work in Canada (Shacar 2006). In addition, unlike the U.S., dual career

families are given consideration, allotting additional points to applicants. Since 1995, highly skilled immigrants and their families “receive lawful permanent residency immediately upon their arrival in Canada” (Shacar 2006, 128) a most attractive incentive for immigrants seeking permanent residency.

Australia

In 1973, Australia followed the U.S. and Canada, introducing new immigration policies aimed at attracting highly skilled immigrants. Australia adopted a similar point system to Canada’s, admitting highly skilled workers on the basis of language proficiency, age, specific work experience and occupational skills (Shacar 2006). The “skilled independent” category, admitting highly skilled migrants on the basis of their point system qualification “accounted for approximately one-third of Australia’s immigration intake in 2001, “fueling migration in order to bolster “human capital acceleration, innovation, and the fueling of productivity and economic growth” (Shacar 2006, 130). Australia offers highly skilled migrants permanent residency status, and immigrants can begin the process of naturalization immediately upon arrival, and are eligible to apply for citizenship after just two consecutive years. In addition, Australia has invested in settlement programs for immigrants, providing the “world’s most generous and open naturalization process in the world” (Shacar 2006, 131).

New Zealand

New Zealand joined in the international race for talent in 1991, implementing its own point system designed to attract highly skilled immigrants “who want to come to live and work in New Zealand and who have the skills that New Zealand needs to help it

prosper nationally and internationally” (Barry 2006, 133). To qualify, applicants must score points based on work experience, professional and educational qualifications, and age. Like Canada and Australia, points are also granted based on the qualifications of the applicant’s spouse or partner, but unlike those two nations, New Zealand also awards points to highly skilled immigrants who are working or have past working experience in New Zealand, or have obtained higher education in the country (Shacar 2006). Further still, with the passage of the Immigration Amendment Act of 2003, New Zealand formed a partnership between government and industry, similarly to the U.S., allowing employers to recruit skilled workers abroad and petition the government for “accredited status.” Employers offer not only positions of employment and employment visas to highly skilled, but also a fast track to entering the country.

Europe

European countries have recognized competition for people as the key element in maintaining a competitive edge in the global market. Many European countries have introduced major changes to their immigration policies, specifically targeting highly skilled migrants. Some countries have taken great strides in innovating and managing highly skilled migration streams into their countries, attracting students, workers and researchers, hoping to develop their talent pool.

Germany

Germany introduced its groundbreaking “green card” program in 2000, providing work permits for highly skilled immigrants, especially in the fields of information and communication technology (Shacar 2006). The program was created to manage labor

shortages in particular sectors and to provide both temporary and permanent opportunities for highly skilled immigrants (Cyrus and Vogel 2003). In 2002, Germany introduced the significantly liberalized German Immigration Act. It passed in 2004, specifically targeting scientists, academic researchers, and high-ranking managers in business and industry – allowing them immediate settlement permits, and for their spouses and partners to join them and obtain employment (Shacar 2006). Foreign students are also encouraged to stay in Germany after completing their studies. Along with its competitors, Germany recognized the admission of highly skilled migrants “as a tool to advance the economic interests and boost global competitiveness” (Shacar 2006,142). Germany’s interior minister, Otto Schily, explained, “there’s competition among the industrialized countries for the best minds. That’s why we have to direct our immigration law more strongly towards our own interests” (Migration News 2005).

The United Kingdom

The U.K. presented its Highly Skilled Migrant Programme in 2002, an elaborate point system designed to attract highly skilled migrants and the economic benefits they provide. The program places emphasis on educational qualifications and past work experience, and even an applicant’s past earnings and achievement (Shacar 2006). The program leads to eventual citizenship to those admitted, designed to “ensure that visitors, businessmen, students and others who benefit the U.K. feel encouraged to come” (U.K. Home Office 1998). Those who enter the country receive a one-year residency permit, which can be extended for three years, and spouses and children less than eighteen years of age are allowed to join them. After a period of four years, the highly skilled migrant may then apply for permanent settlement in the United Kingdom.

Other European Countries

In this global competition, no country wants to fall behind. Sweden has introduced admissions procedures that grant automatic permanent residency status upon the moment of entry into the country to the highly skilled migrant and their families. Similar admissions policies have emerged in the Netherlands, France, Norway, and Ireland (Shacar 2006: 146). Recruiting European countries are capitalizing on what is described as the “decreasing hospitality” of the United States. These countries have seen an increase in the number of highly skilled migrants entering the European Union where they are “more likely to receive a more privileged employment status, which also gives them the best opportunity to integrate and settle in the host country” (Shacar 2006, 147).

Asia

Emerging trends in India, Japan, Singapore, Taiwan, Korea, and Malaysia reveal how these countries have focused on attracting temporary and permanent highly skilled immigrants and professionals as other governments are attempting to do so. Like Canada, Australia, New Zealand and Europe, they have introduced immigration policies offering incentives for highly skilled migrants to come *home*, including, but not limited to “permanent residence status, unlimited stay, heavy investments in public research, dual citizenship, tax incentives, etc.” (Manuel-Martinez 2008, 12). Often Asian countries are seeking to lure back their own diasporas — the professionals and students who left for other countries years ago. Taiwan has been especially successful in maintaining contacts with expatriates and drawing them back as industrialization progressed (Castles and Miller 2009). South Korea has been a model for some degree of success for reversing the

flow of highly skilled immigrants, attracting workers due to high-tech expansion and investment, including permanent residence status (Song 2003, 2). In addition, other factors come into play, such as family and cultural ties, and a slowdown of economic growth worldwide.

China and India

As China and India both continue to grow economically, both countries are actively seeking to maintain their best and brightest and bring home former émigrés. China established the Hundred Talents Program in 1994 to attract “outstanding researchers in the sciences and technology” (Gafner and Yale-Loehr 2010, 191). Combined with the Yangtze River Scholar Scheme, over 4000 researchers have come back to China to establish themselves back in their home country (Gafner and Yale-Loehr 2010, 191). The One Thousand Talents Program was announced in 2009, aimed to attract persons with “full professorships or the equivalent in developed countries” and offers a handsome relocation payment (Gafner and Yale-Loehr 2010, 191). The program welcomes both Chinese nationals and non-Chinese nationals, with a goal of finding researchers who to lead “key laboratories, projects, and disciplines in China” (Gafner and Yale-Loehr 2010, 191).

India has developed similar programs, designed to attract its talented scientists and researchers to return home. The Indian Council of Scientific and Industrial Research formed a program to recruit distinguished and outstanding scientists of Indian descent to return to India to become “dynamic leaders of science who would lead and build centres of excellence in national laboratories” (Gafner and Yale-Loehr 2010, 192). The program

offers incentives such as housing, a chauffeured car, generous pay and other benefits (Gafner and Yale-Loehr 2010, 192).

The continued economic development of these countries, coupled with attempts to attract a specific talent pool may have long-term ramifications for the United States and its future role in technological innovation. The future of American technological innovation depends on how welcoming and accommodating the United States immigration system becomes in the future.

CHAPTER VI

CONCLUSION: THE FUTURE OF AMERICAN INNOVATION

This thesis sought to identify the historical, educational, economic, and social elements that drive highly skilled foreign migrants to seek opportunities in the United States. This study specifically inquired how the migration of foreign human capital influences the dynamics of the high-tech American economy, and what implications those dynamics will have on the future of American technological innovation. The United States has seen tremendous changes in migration flows since legislation in 1965 drastically altered the course of migration policy that continues to shape the U.S. today. Immigration of both low and highly skilled workers, undocumented and documented are critical elements to American economic productivity and prosperity, a proven advantage for America.

Attracting highly skilled workers is essential for the United States to maintain its competitive edge in technological innovation as the rest of the world rises in the global economy and competes for a critical talent pool. Without it, the U.S. may not have established itself as the global leader of innovation. This research sought to explain that in addition to human capital and social capital, the intermediary factor connecting the two sources, is receptivity, and in a global context, citizenship in exchange for talent has become the ultimate incentive to attract highly skilled immigrants.

American economic success has been founded on principles of welcoming all migrants – all races, all creeds, all religions to pursue “life, liberty and the pursuit of happiness.” Receptivity is the critical element to maintain America’s productivity and capacity to continue to innovate in the future. Highly skilled workers seek opportunities in the United States, and establish social capital in areas in which they settle, on a condition of positive reception that is based on inclusion and membership into a larger society.

Reception is not only a factor in establishing social capital, but also influences the geographic dispersion and settlement of highly skilled foreign immigrants. Trends indicate that highly skilled immigrants disperse to areas where high-tech industries are located, which are also attractive metropolitan areas that are diverse centers of culture and knowledge. Cities such as Seattle, San Francisco, and Washington, D.C. have become popular destinations, as well as areas situated near major universities and colleges, such as the Boston-Cambridge area. The strength and attractiveness of American research institutions, universities and colleges is unparalleled. Foreign students seek enrollment in colleges and universities that provide opportunities to obtain educational and research opportunities. Employer demand for highly skilled workers is also high, but possibly overstated, with companies and firms eagerly awaiting the migration of highly skilled foreign immigrants.

The implications for future research extend to further discussion of the processes and theories of migrant assimilation. Rather than migrants simply “melting” into a predominantly white and English-speaking society, the transformations of the United States with regard to culture, ethnicity and class have rendered a nation that relies on

immigration to maintain its population levels. Theories of assimilation and incorporation, ranging from classic theories of assimilation, multiculturalism, and more recently, transnationalism, may find useful application in understanding the function of receptivity in continually attracting highly skilled foreign immigrants and students, and keeping them in the United States. In addition, examining internal migration flows of foreign students and highly skilled workers within the United States may provide further insight to the geographies of skills, examining social relationships amongst migrants and natives developing in new places examining the processes of accumulating social capital in terms of receptivity.

The United States has succeeded in leading the world in technological innovation and advancement in part because of its openness to ideas, inventions and risk. However, perhaps more important is its reception to people and cultures. Reception of immigrants to the United States is one of its greatest strengths and has been an asset in attracting the best and brightest from around the world. The evidence presented here indicates that should America continue to recognize the value of highly skilled foreign migrants and facilitate the migration flows with positive reception, the U.S. will continue to be a world leader in technological innovation and advancement.

WORKS CITED

- Bialeck, Carl. 2005. Outsourcing fears help inflate some numbers. *The Wall Street Journal Online*. August 26.
- Brettell, Caroline B. 2005. Voluntary organizations, social capital, and the social incorporation of Asian Indian immigrants in the Dallas-Fort Worth Metroplex. *Anthropological Quarterly* 78(4): 853-883.
- Bureau of Navy Personnel. 1976. Filipinos in the United States Navy. (<http://www.history.navy.mil/library/online/filipinos.htm> last accessed 02 February 2012).
- Cheng, Lucie and Philip Q. Yang. 1998. Global interaction, global inequality, and migration of the highly trained to the United States. *International Migration Review* 32(3): 626-653.
- DeVol, Ross, Perry Wong, Armen Bedroussian, Candice Flor Hynek and David Rice. 2009. North America's high-tech economy. The geography of knowledge-based industries. *Milken Institute*.
- Docquier, Frédéric and Hillel Rapoport. 2007. Skilled migration: the perspective of developing countries. *Institute for the Study of Labor*. Discussion paper No. 2873.
- Farr, James. 2004. Social capital. A conceptual history. *Political Theory* 32 (1): 6-33.
- Florida, Richard. 2002. The economic geography of talent. *Annals of the Association of American Geographers* 92(4): 734-755.
- Freeman, Richard B. 2006. "Does globalization of the scientific/engineering workforce threaten U.S. economic leadership?" *Innovation Policy and the Economy* 6: 123-157.
- Freidman, Thomas L. 2009. The open-door bailout. *The New York Times* (<http://www.nytimes.com/2009/02/> last accessed 2 February 2011).

- Gamarnikow, Eva. 2003. Social capital and human capital. *Encyclopedia of Community* (<http://www.sagepub.com/healeyregc6c/study/chapter/encycarticles/ch02/GAMARN~1.PDF> last accessed 03 February 2012).
- Gambino, Christine and Thomas Gryn. 2010. The foreign born with science and engineering degrees. *American Community Survey Briefs*.
- Goddard, Roger D. 2003. Relational networks, social trust, and norms: A social capital perspective on students' changes of academic success. *Educational Evaluation and Policy Analysis* 25(1): 59-74.
- Hall, Matthew, Audrey Singer, Gordon F. De Jong and Deborah Roempke Graefe. 2011. The geography of immigrant skills: Educational profiles of metropolitan areas. *Metropolitan Policy Program*. (http://www.brookings.edu/~media/Files/rc/papers/2011/06_immigrants_singer/06_immigrants_singer.pdf last accessed 3 February 2012).
- Hurh, Won Moo and Kwang Chung Kim. 1990. Religious participation of Korean immigrants in the United States. *Journal for the Scientific Study of Religion* 29(1): 19-34.
- Immigration Policy Center. 2009. The U.S. economy still needs highly skilled foreign workers. *American Immigration Council* (<http://www.immigrationpolicy.org/just-facts/us-economy-still-needs-highly-skilled-foreign-workers> last accessed 10 November 2011).
- Immigration Policy Center. 2010. Employment-based immigration to the United States: A fact sheet. *American Immigration Council* (<http://www.immigrationpolicy.org/just-facts/employment-based-immigration-united-states-fact-sheet> last accessed 10 November 2011).
- Iredale, Robyn. 2001. The migration of professionals: Theories and typologies. *International Migration* 39(5): 7-26.
- Kannankutty, Nirmala and Joan Burrelli. 2007. Why did they come to the United States? A profile of immigrant scientists and engineers. *National Science Foundation*.
- Kerr, William R. 2008. The ethnic composition of US inventors. *Harvard Business School HBS Working Paper* 08-006.
- Kirkegaard, Jacob F. 2007. The accelerating decline in America's high-skilled workforce: Implications for immigration policy. *Policy Analyses in International Economics* 84.

- Lee, Marlene A. and Mark Mather. 2008. Population bulletin: U.S. labor force trends. *Population Reference Bureau* 63(2).
- Liu, John M., Paul M. Ong, and Carolyn Rosenstein. 1991. Dual chain migration: Post-1965 Filipino immigration to the United States. *International Migration Review* 25(3): 487-513.
- Lowell, B. Lindsay. 2001. Skilled temporary and permanent immigrants in the United States. *Population Research and Policy Review* 20(1/2): 33-58.
- Malone, Nolan, Kaari F Baluja, Joseph F. Constanzo and Cynthia J. Davis. 2003. The foreign-born population: 2000. Census 2000 Brief (<http://www.census.gov/prod/2003pubs/c2kbr-34.pdf> last accessed 21 October 2011).
- Martin, Philip and Elizabeth Midgley. 1999. Immigration to the United States. *Population Bulletin* 54(2).
- Martin, Philip and Elizabeth Midgley. 2006. Immigration: Shaping and Reshaping America. *Population Bulletin* 61(4).
- McCabe, Kristen and Doris Meissner. 2010. Immigration and United States: Recession affects flows, prospects for reform. *Migration Policy Institute* (<http://www.migrationinformation.org/usfocus/print>, last accessed 03 January 2012).
- Migration Policy Institute. Ten source countries with the largest populations in the United States as percentages of the total foreign-born population: 1980. (<http://www.migrationinformation.org/DataHub/charts/10.80.shtml> last accessed 08 September 2011).
- Migration Policy Institute. Ten source countries with the largest populations in the United States as percentages of the total foreign-born population: 2000. (<http://www.migrationinformation.org/DataHub/charts/10.2000.shtml> last accessed 08 September 2011).
- Min, Pyong Gap. 1992. The structure and social functions of Korean immigrant churches in the United States. *International Migration Review* 26(4): 1370-1394.
- National Foundation for American Policy. 2008. NFAP Policy Brief: H-1B visa and job creation.
- National Research Council. 1996. Five Statistics on U.S. immigration: An assessment of data needs for future research.

- Organization for Economic Cooperation and Development. 2002. International mobility of the highly skilled. (<http://www.oecd.org/dataoecd/9/20/1950028.pdf> last accessed 12 November 2011).
- Portes, A. and M. Zhou. 1993. The new second generation: Segmented assimilation and its variants. *Annals of the American Academy of Political and Social Sciences* 530: 74-96.
- Regets, Mark C. 2007. Research issues in the international migration of highly skilled workers: A perspective with data from the United States. *National Science Foundation Working Paper SRS 07-203*.
- Reitz, Jeffrey. 2002. Host societies and the reception of immigrants: Research themes, emerging theories and methodological issues. *International Migration Review* 36(4): 1005-1019.
- Shachar, Ayelet. 2006. The race for talent: highly skilled immigrants and competitive immigration regimes. *New York University Law Review* 81 (600): 101-158.
- Singer, Audrey. 2004. The rise of new immigrant gateways. *The Living Cities Census Series* (http://www.brookings.edu/~media/Files/rc/reports/2004/02demographics_singer/20040301_gateways.pdf last accessed 12 September 2011).
- Spener, David. 2009. Trust, distrusts, and power. *Clandestine Crossings: Migrants and coyotes on the Texas-Mexico Border*. Ithaca, NY: Cornell University Press. Chapter 5.
- Stephan, Paula E. and Sharon G. Levin. 2001. Exceptional contributions to US science by the foreign-born and foreign-skilled. *Population Research and Policy Review* 20(1/2): 59-79.
- Terrazas, Aaron. 2009. Korean immigrants in the United States. *Migration Information Source* (<http://www.migrationinformation.org/usfocus/display.cfm?ID=716> last accessed 3 February 2012).
- Toppo, Greg. 2008. U.S. student's math, science scores deliver mixed results. *USA Today*. (http://www.usatoday.com/news/education/2008-12-09-math-sci-scores_N.htm last accessed 3 January 2012).
- Walters, Nathan P. and Edward N. Trevelyn. 2011. The newly arrived foreign-born population of the United States: 2010. *American Community Survey Briefs*.

- Watts, Julie R. 2001. The h1-b visa: free market solutions for business and labor. *Population Research and Policy Review*. 20(1/2); 143-156.
- Weeks, John R. 2008. Population. An Introduction to Concepts and Issues, Tenth Edition. Belmont, CA; Wadsworth.
- U.S. Department of Education, National Center for Education Statistics IES. 2009. Integrated postsecondary education data system "completions survey".
- US Senate Judiciary Committee. (2000). American Competitiveness Act in the Twenty First Century Act (S.2045) Report 106-260. April 11, 2000.
- Usdansky, Margaret L. and Thomas J. Espenshade. 2000. The h1-b visa debate in historical perspective: The evolution of U.S. policy toward foreign-born workers. Center for Comparative Immigration Studies. 1-13.
- Zakaria, Fareed. 2011. The Post-American world: Release 2.0. New York; W.W. Norton.
- Zakaria, Fareed. 2009. Is America losing its mojo? *Newsweek*
<http://www.newsweek.com/2009/11/13/is-america-losing-its-mojo.print.html>.

VITA

Jessica Devlyn Butterworth was born in Sonora, Texas on September 1, 1986, the daughter of Donna Moore Butterworth and Ronald Bishop Butterworth. After completing her work at Communications Arts High School, San Antonio, Texas, in 2004, she entered The University of Texas at San Antonio. She received the degree of Liberal Arts from The University of Texas at San Antonio in 2007. In August 2008, she entered the Graduate College of Texas State University-San Marcos.

Permanent Address: jdeskander@gmail.com

This thesis was typed by Jessica D. Butterworth.