The Paradox of High-Skilled Migration: Is the Brain Drain the Best Antidote to the Brain Drain?

Master’s Thesis

Presented to

The Faculty of the Graduate School of Arts and Sciences
Brandeis University
Graduate Program in Global Studies
Kristen Lucken, Advisor

In Partial Fulfillment
of the Requirements for the Degree

Master of Arts
in
Global Studies

by
Stephen Ernst

August 2015
ABSTRACT

The Paradox of High-Skilled Migration: Is the Brain Drain the Best Antidote to the Brain Drain?

A thesis presented to the Graduate Program in Global Studies

Graduate School of Arts and Sciences
Brandeis University
Waltham, Massachusetts

By Stephen Ernst

Scholars have commonly understood the brain drain phenomenon as mostly a loss of human capital for developing countries—and little more. As many scholars consider human capital to be an important determinant of economic growth, the brain drain may actively deprive low-income countries of their engines of development. To this date, most poor countries have been unable either to legally compel or to morally persuade their high-skilled migrants to stay in significant numbers. Research shows that even if nations were effective at stemming this outward flow, that would not produce economic growth. Directly preventing the brain drain by closing borders increases rent-seeking, as would-be migrants stay and pursue careers that often detract from rather than foster economic development.

This thesis seeks to demonstrate that some of the major determinants of the brain drain, specifically the absence or weakness of institutions crucial to development, poor macroeconomic policy, and the lack of social capital, have been and can best be mitigated by the brain drain itself—by the out-migration of high-skilled workers. High-skilled diaspora who remain abroad influence public
policy in their home countries and provide business connections to migrants who return to start businesses; but the biggest impact seems to be produced by migrant information technology workers (ITWs). Whether or not they return indefinitely, ITWs often acquire social capital in information communications technology (ICT) hubs like Silicon Valley, which affords them connections with the venture capital industry in those ICT hubs. Some of this social capital may serve to connect like-minded entrepreneurs with one another and spawn new ideas. Once they have acquired a significant amount of social capital, ITWs then transfer the institution of venture capital to their countries of origin. The influx of venture capital provides more financing for small and medium-sized enterprises, the backbone of an economy, leading to economic growth. Of all available options facing nations combating the economic costs of high-skilled migration, then, the problem itself may also be the best solution. Indeed, the brain drain may be its own antidote.
# TABLE OF CONTENTS

I. Introduction......................................................................................................................................1

II. Defining Terms...............................................................................................................................4

III. Assumptions..................................................................................................................................9

IV. Overview of the Brain Drain.......................................................................................................11
   A. What Constitutes the Brain Drain?
   B. Differentiating the Brain Drain by Country and Occupation
   C. Brain Drain Numbers for IT Workers
   D. What are the Negative Effects of the Brain Drain?

V. Determinants of the Brain Drain...................................................................................................17
   A. Institutions
   B. Policies
   C. Social Capital
   D. Other Determinants

VI. Unsuccessful Methods of Combating the Brain Drain................................................................27
   A. Morally Persuading High-Skilled Workers
   B. Barring High-Skilled Workers From Migrating
   C. Rent-Seeking is the Result
   D. Provisional Conclusion of the Determinants of the Brain Drain
I. INTRODUCTION

Common scholarly views of the brain drain phenomenon throughout the 20th century and into this century have understood it as mostly a loss of human capital for developing countries—and little more (Oberman 2013; Glavan 2008; Rajput 2002; Ana, Makasa, and Twisselmann 2005). The tragedy of the brain drain phenomenon is that many scholars consider human capital to be an important determinant of economic growth and ultimately human well-being, yet the best and the brightest often leave underdeveloped nations for better opportunities elsewhere (Frank 1960; Miyagiwa 1991; Gundlach 1995; Cheng and Mittelhammer 2008; Glaeser et al. 2004; Haque and Kim 1995). Thus, the natural next step in the argument is that the brain drain actively deprives low-income countries of their engines of growth. To this date, most poor countries have been unable either to legally compel or to morally persuade their high-skilled emigrants to stay in significant numbers (NYT 2014; Lee 2014; Carens 1987; Meilander 1999). Research shows that even if nations were effective at stemming this outward flow, that effort would not address the core issues behind the brain drain phenomenon and underdevelopment in general (Peng 2009; Miyagiwa 1991). Directly preventing the brain drain through closed borders increases rent-seeking, as would-be migrants stay and seek to maximize their profit at the expense of larger society rather than migrating and maximizing their intellectual potential, which could ultimately benefit both the migrant and society (Peng 2009). In essence, highly educated citizens who are unable to migrate often become lobbyists, lawyers, and politicians, rather than leaving to train as doctors, engineers, and technology workers abroad.

This thesis explores some of the major determinants of the brain drain phenomenon in Taiwan, Israel, China, and India—specifically the absence or weakness of institutions crucial to development,
poor macroeconomic policy, and the lack of social capital available to entrepreneurs. For example, when the crucial institution of venture capital is scarce, it is very difficult for small and medium-sized enterprises to secure the funding they need to flourish. Given that small and medium-sized enterprises are widely regarded as the lifeblood of an economy, the absence of venture capital greatly decreases poor nations' prospects for development (Keuschnigg 2004). And in the absence of economic development, high-skilled workers seek better opportunities abroad. Likewise, when corporate governance standards—another key institution—are lax or underdeveloped, companies fail to contribute substantially to a country's economic growth, which again drives high-skilled workers to pursue the more attractive jobs and lifestyles offered by developed countries (Khanna and Palepu 2004). So without the economic development afforded by institutions such as venture capital and corporate governance standards, high-skilled workers migrate to developed countries, where these institutions contribute to thriving economies. (Glaeser et al. 2004). In the same way, poor macroeconomic policies also contribute to the brain drain—as was the case with India's so-called 'License Raj,' which imposed a strict set of regulations that stymied economic growth with excessive red tape. As a result of such constrictions on development, high-skilled workers sought better opportunities abroad (Pistone and Hoeffner 2007, 161). And finally, when a country's entrepreneurs lack extensive social capital—the international business networks that bestow entrepreneurs with the connections and knowledge necessary to compete globally--its economy lags and its high-skilled workers leave.

This thesis argues that while these various factors all contribute to the stifling of economic development in poor countries and thus, to the loss of human capital, the best remedy to these problems may be the brain drain itself. Migrants who work and study abroad accumulate a host of new resources through these experiences and often bring back important tangible and intangible assets to their home countries. For instance, they gain social capital by joining ethnic professional networks and possibly acquire new business ideas alongside (Saxenian 2002), both of which they may use to start businesses.
in their home countries. Furthermore, through their high economic and social status as successful high-skilled migrants, they often acquire political capital and lobby for business-friendly policies in their countries of origin (Doquier and Rapoport 2012, 718). Some of them may even return to import venture capital to their home countries, increasing investment and integration with the global economy through “Ethnic Direct Investing” (EDI) (Ye 2009).

The focus of this thesis is on high-skilled migrants from the technology sector who participate in a phenomenon known as “brain circulation.” This term describes the process wherein high-skilled migrants acquire new institutions, social capital, and business ideas abroad, and then invest in their countries of origin and influence macroeconomic policy either from within or from afar. While emigrant doctors and physicists may push for policy changes in their home countries, information technology workers seem to have a much deeper impact, pushing for policy changes as well as importing valuable institutions that—especially in India, Taiwan, China and Israel—are leading to impressive economic growth (Saxenian 2002). Of all available options facing those combating the economic costs of high-skilled migration, then, the problem itself may also be the best solution. Indeed, the brain drain may be its own antidote.
II. DEFINING TERMS

This thesis employs various terms that have ambiguous meanings. These terms are: high-skilled migrants, information technology workers, information and communications technology cluster, institutions, institutional quality, institutional transfer, rent-seeking, policies, social capital, moral suasion, human capital, virtuous circle, and biogeography.

High-Skilled Migrants

The European Migration Network defines high-skilled (also called highly-skilled) migrants in general terms: “Broadly speaking, the definition used for a highly-skilled worker is on the basis of level of salary and/or educational qualifications and/or specific sectors or occupations” (2007, 4). There exists no consensus on what exactly a high-skilled migrant is, but for the purposes of this thesis, the term is defined as someone with: a) above median income, b) above median educational attainment, and c) a recognized specialization in a field, often where the domestic supply of labor is perceived by a group or groups to be lacking.

Information And Technology Workers

There is no universally accepted definition of information and technology workers, partially because a definition could be as specific as a data entry specialist or as abstract as including work with radio and books (Computing Research Association 2015). This thesis uses the Computing Research Association's definition of information and technology workers: those who work with computer-based systems, both
hardware and software. And it defines 'computer-based systems' as those “ranging from the design and production of chips...through the design and creation of complex, computer-based systems for a particular application...to the end-use of such systems” (2015).

Information and Communications Technology Cluster

According to Katherine Pedchenko at Starcom Worldwide, a technology cluster is a: “network of strategically interconnected businesses and associated institutions in a particular geographic area Connected by their markets, products and services, as well as their suppliers, trade associations and educational institutions.” Silicon Valley is a famous example of a technology cluster (2010).

Institutions

The literature on institutions is vast and growing. This thesis uses Douglass North's definition of institutions, which defines them as the “humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)” (1991, 97). There is little empirical or anecdotal evidence on the transfer of informal institutions by high-skilled migrants, so this thesis focuses on formal institutions.

Institutional Quality

The Global Competitiveness Index (GCI) roughly defines institutional quality as how institutions relate to competitiveness and growth. High quality institutions lead to better growth, while low quality institutions stifle growth. The Global Competitiveness Index gives examples of why institutional quality matters, explaining that “owners of land, corporate shares, or intellectual property are unwilling to invest in the improvement and upkeep of their property if their rights as owners are not protected” (GCI 2015, 6). The definition of “what constitutes a high quality institution” or even the assumption
that economic growth is necessarily good can be deconstructed further, but since the GCI is heavily
cited in scholarly writings, this thesis relies on its metric as a measure for institutional quality

Institutional Transfer
This thesis defines institutional transfer as the transfer of high-quality formal rules, like those that make
up venture capital, from one country to another. This may be a unilateral transfer (only one active,
imposing participant, group, or nation) or a multilateral transfer.

Rent-Seeking
According to the Library of Economics and Liberty, rent-seeking occurs when people “try to obtain
benefits for themselves through the political arena” (Henderson 2008). Baochun Peng, a professor at
Hong Kong Polytechnic University, argues that would-be migrants become lobbyists instead of doctors
and engineers in order to use their talents to create wealth for themselves with little benefit to society
(2009, 1562). Peng acknowledges that doctors and engineers are often rent-seekers as well, but he
contends that they are less likely to make a living from this behavior than lobbyists are and that they
might benefit society in ways politicians bent on enriching themselves would not (2009, 1562). Peng’s
argument serves as an important component to this thesis.

Policies
Merriam Webster defines a policy as, “a high-level overall plan embracing the general goals and
acceptable procedures especially of a governmental body” (2015). The University of Norwich gives a
more specific definition of public policy: “courses of action, regulatory measures, laws, and funding
priorities concerning a given topic promulgated by a governmental entity or its representatives” (2015).
These definitions encompass the ways in which this term is used in this thesis.
Social Capital

Various definitions for social capital exist, from social skills that allow people to profit from interactions (Glaeser, Laibson, and Sacerdote 2002) to capital engendered by relational dealings (Coleman 1990). However, this thesis uses Bourdieu’s definition of social capital, which frames it as "the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu and Wacquant 1992, 119).

Morally persuade/Moral suasion

This thesis employs these terms to refer to governments’ use of moral arguments—such as civic obligation—to induce would-be high-skilled migrants to remain in their home countries rather than 'abandoning' them for more lucrative opportunities abroad.

Human Capital

The Encyclopedia Britannica defines human capital as “the intangible collective resources possessed by individuals and groups within a given population. These resources include all the knowledge, talents, skills, abilities, experience, intelligence, training, judgment, and wisdom possessed individually and collectively, the cumulative total of which represents a form of wealth available to nations and organizations to accomplish their goals” (2015).

Virtuous Circle

Also known as a virtuous cycle, is defined by Oxford Dictionaries as: “A recurring cycle of events, the result of each one being to increase the beneficial effect of the next” (2015). An example of a virtuous circle would be migrants returning in small numbers to their oppressive nations to invest, causing
economic growth leading to a wealthy populace who demand better rule of law, with the result being a nation of healthy political institutions.

*Biogeography*

Biogeography as a composite of biology (living organisms) and geography (the natural features of a place) can best be described as living organisms within a certain geographical area (Merriam 2015) (Hibbs and Olsson 2003). In this thesis, biogeography refers to harmful organisms, such as the malaria-carrying Anopheles mosquito, present only in certain regions.
III. ASSUMPTIONS

This thesis is based on a few core assumptions that are open to deconstruction: 1) that economic development is good and that in developing nations such as India, economic inequality has not increased as a result of economic development; 2) that integration into the global economy is necessary for economic development; 3) and that people migrate for a variety of reasons (status, the ability to live out their true identity, increased dignity and rights, for relationships), but primarily for economic profit. Yapu, Wisner and Luce, for example, reject the idea that economic development is a good thing, pointing out the myriad of human rights abuses, higher incidence of disease, and the changed power dynamics brought about by leaving the tribal society (1995). Nonetheless, the body of literature on development generally frames economic development as being beneficial to a society, so this thesis works from this premise.

Considering the case of India, Nobel Laureate Amartya Sen and Jean Dreze (2013) challenge the notion that economic development has not caused greater economic inequality. He argues instead that some demographics have benefited while others have not. Meanwhile, Columbia University professor Jagdish Bhagwati and Arvind Panagariya (2013) provide their own measure of economic inequality by which they find that inequality in India hasn't risen for any of the demographic groups but rather incomes have risen in absolute terms for all. According to Bhagwati and Panagariya's methodology, rural villagers aren't likely to compare themselves with urban dwellers, thus, what matters is if there is a rise in inequality within villages, neighborhoods, or groups that are in
competition; and he finds no such rise. This thesis assumes Bhagwati and Panagariya's methodology allows for a more accurate measure of economic equality than the well-accepted GINI coefficient.

The assumption that integration with the global economy is something to be sought after has received much criticism throughout the 20th century. Advocates for import substitution industrialization (ISI), who are many, argue that the global south is underdeveloped precisely because it is dependent on foreign imports from the global north or that at the very least, barriers to trade and migration would be beneficial for developing nations (Massey and Capoferro 2006; Potter 2007; Rodrik 2007). The ISI theory contends that global southern nations can foster development only by reducing imports from the global north and increasing domestic production, for local consumption as well as for export to other global southern nations. There are good arguments to support this theory, not least of which is the nationalist aim of reducing dependence on former colonial powers. While ISI might produce growth in the short run, however, in the long run it is likely not to yield the robust growth afforded by integration into the global economy, which brings the benefits of comparative advantage through specialized production. Instead of manufacturing products that countries have not relative or absolute advantage in, instead they should produce only what they are best positioned to (Schoenerwald and Vernengo 2007, 81; Investopedia 2015).

Concerning motives for migration, the idea that high-skilled workers, in particular, migrate for profit is simplistic (Haas 2005, 1269). Yet while economic profit alone is not the reason why migrants leave their countries of origin, it is often tied closely to status, increased dignity, and relationships. It seems reasonable to assume that a higher wage provides people with many of these core abstract goods or that people sometimes pursue abstract goods (relationships) for the economic profit they can bring. Thus, speaking in economic terms does not diminish the importance of the varied ways in which migration intent expresses itself.
IV. OVERVIEW OF THE BRAIN DRAIN AND METHODS

*What Constitutes the Brain Drain?*

Like so many academic disputes, it seems, the debate over how many people actually contribute to the brain drain is essentially a dispute over methodology. This thesis attempts to make sense of the latest methods of understanding the data that exists on the outmigration of high-skilled workers in order to provide a level-headed estimate of the actual brain drain statistics globally. According to Beine et al., “recent data sets on international skilled migration (Carrington and Detragiache 1998; Adams 2003; Docquier and Marfouk 2004, 2006; Dumont and Lemaitre 2004) define skilled immigrants as foreign-born workers with university or post-secondary training. This definition, based on the country of birth, does not account for whether education was acquired in the home or the host country” (2007). Holding this assessment in mind, it seems that the problem of the brain drain may have been overstated until recently because statisticians are failing to take into consideration migrants’ age and education levels when entering developed countries (2007). At the forefront of reinterpreting the data are scholars, such as Mark Rosenzweig (2006), who pull data from the World Bank Migration Database. Rosenzweig presents two metrics for analyzing the brain drain, the first being: $\text{BD}_i = \Sigma \text{FB}_{ij}/(\Sigma \text{Si} + \Sigma \text{FB}_{ij})$, “where $\text{FB}_{ij}$ = tertiary-educated persons age 25+ born in country $i$ residing in destination country $j$ and $\text{Si}$ = tertiary-educated persons residing in origin-country $i$” (2006). Using this simple formula we can conclude that 80% of tertiary-educated Haitians reside outside of Haiti. Until recently, this methodology has been employed successfully to obtain an estimate of the international brain drain statistics. Using this methodology, Figure 1 shows estimates of the worst sufferers of the brain drain.
The second definition of the brain drain, however, employs a more sophisticated methodology which represents only tertiary-educated people who were educated in the sending countries (domestic brain drain) (Rosenzweig 2006). The formula is as follows: $\text{DBD}_i = \frac{(\Sigma \text{FBH}_{ij})}{(\Sigma \text{FBH}_{ij} - \Sigma \text{SFB}_{ij})}$, “where $\text{FBH}_{ij}$ = foreign-born residents educated in $i$ living in $j$ and $\text{SFB}_{ij}$ = home-country residents in $i$ educated in $j$” (2006). The reason for this new methodology is that many foreign-born receive their schooling in Western nations, “thus the numerator is biased upwards.” In essence, the brain drain is made worse when the sending country invests in the education of high-skilled workers and then lose
that investment when they migrate. Along the same lines, many “stayers” receive their schooling in Western countries and return. “According to Bureau of Citizenship and Immigration Services data (FY 2003), 20 percent of permanent resident aliens in the U.S. arrived before age 18,” meaning that it is highly unlikely they received their tertiary schooling in their countries of origin (2006).

Citing Beine, Docquier, and Rapoport, Rosenzweig argues that corrected estimates of the brain drain are about 68% of the original numbers, some even as low as 51% (2006). Biene, Docquier, and Rapoport find that nations such as India and China even experience a brain gain (2008). The aggregate result, in fact, is that “migration prospects raise the expected return to human capital in the developing country, thus inducing more people to invest in education” (2008). A global 3% human capital accumulation occurs simply due to the gains in heavily populated countries like India and China where proportionately small numbers migrate. The possibility of going abroad raises investment in education disproportionate to the amount of people that actually have the ability to venture abroad.

Differentiating the Brain Drain by Country and Occupation

Although Beine, Docquier, and Rapoport posit that the brain drain is much less significant than previously thought, it still affects certain nations much more than others (2008). Small nations with small populations that are close to major developed countries have extraordinarily high levels of the brain drain. Even if Table 1 were corrected according to the new methodology, brain drain rates would still be astronomical in the Caribbean and some African nations. To make matters worse, Niimi et al. find that “remittances decline with migrants’ education level,” either because they belong to wealthy families who do not depend on that income or because they bring their families with them (2008). In other words, some low-income nations not only have to bear the costs of educating their citizens, but when some of those citizens leave, they often have no way of making up the lost investments since remittances from those high-skilled migrants are so low. But what is the brain drain situation like for
technology workers?

**Brain Drain Numbers For Information Technology Workers**

While most high-skilled migrants enter the US on a J-1, L-1, or H-1B visa, distinguishing among types of high-skilled migrants is important for the purposes of this thesis. Migrants in the technology and engineering sectors generally enter on H-1B visas. “H-1B visas are temporary visas that allow foreign nationals to work in the United States on short-term projects or as a prelude to a green card. The visas generally are good for up to 6 years (with a renewal after three years)” (NFAP Policy Brief 2010). These visas have become a well-known signifier of the brain drain, given the importance of innovation to economic growth (that will be evidenced later on). According to the Department of Homeland Security, there were 155,223 H-1B visas issued in 2013 with 99,705 coming from India alone and 12,632 from China (Department of Homeland Security 2013). As for the total H-1B population, David North, fellow at the Center for Immigration Studies, remarks that “There is no official estimate of the size of the total H-1B population; our estimate is 650,000 as of September 30, 2009” (2012).

What are the Negative Effects of the Brain Drain?

The previous section mentioned that a global 3% human capital accumulation occurs simply due to the gains in heavily populated countries like India and China. The reason for these gains in human capital in populous countries is that while there are only small immigration quotas, many people prepare and apply for them, so these countries retain a large proportion of 'leftover' high-skilled workers. Yet in those countries where human capital accumulation doesn't occur, a loss in human capital is considered by many to be much more devastating. Human capital is widely recognized as a factor of economic growth by many economic models. One of these economic models is the Solow Model (1951)---named after Nobel Laureate Robert Solow--which attempts to explain the origins of
economic growth (Chen and Mittelhammer 2008, Glaeser et al. 2004, Haque and Kim 1995, Kalaitzidakis et al. 2001). It has been elaborated on by many subsequent scholars, particularly Gregory N. Mankiw, Economics professor at Harvard University and author of the best-selling textbook *Principles of Microeconomics*. In the Mankiw-Romer-Weil version of the Solow Model,

\[ Y(t) = K(t)^{\alpha} H(t)^{\beta} (L(t)A(t))^{1-\alpha-\beta} \]

where \( Y \) = the amount of output or Gross Domestic Product, \( K \) = physical capital such as tractors and printers, \( L \) = labor, \( A \) = labor-enhancing technology, and \( H \) = human capital, or knowledge leading to skills (Dalgaard and Struikik 2013). Looking at the model we can see that if human capital decreases, the total output of the economy decreases as well. Thus, the high rates of human capital flight in nations like Guyana, Barbados, and Dominica are likely to have a significant negative effect on those economies.

Another negative effect of the brain drain can be derived from reasoned assessment. Those high-skilled migrants contributing to the brain drain who are educated in their countries of origin, emigrate to the West, and never return or invest represent a human capital subsidy from poor countries to Western countries. This occurs in two ways. First, if migrants attend a public in-country university before migrating to the West, then there is a government subsidy of education; but secondly, even if they attend a private in-country university, the government still pays for the infrastructure that allows them to get to school, as well as the many other public goods and services of which they partake before becoming taxpayers elsewhere. This human capital subsidy is one of the most disconcerting facts about the brain drain.

**Conclusion**

In sum, we find that: the brain drain is smaller than previously thought; globally, there is no brain drain at the aggregate level; brain drain disproportionately affects certain smaller nations; and technology workers--especially from India and China, which do not see a human capital loss at the
same levels as Haiti and Ghana, represent a significant immigrant technology worker presence in the United States. The next chapter will address the main determinants of the brain drain.
V. DETERMINANTS OF THE BRAIN DRAIN

Though newer research suggests that the brain drain is vastly overestimated and that for some nations it is not a significant problem, for many nations it remains a devastating reality. The simple fact that low-income countries subsidize the education of many of their citizens, who ultimately transfer that human capital investment to developed nations when they migrate, presents a serious moral conundrum. So what exactly are the reasons high-skilled workers leave these countries? Is it the sheer draw of all things 'bigger and better' in developed countries, or is it also the problems and deficiencies in workers' home countries that drive them away? If the brain drain is merely a result of the draw of better opportunities abroad—greedy pull factors, which Ayelet Shachar points out are not likely to change significantly in the foreseeable future—then the few high-skilled migrants who return home do not offer much hope for mitigating the devastating loss of human capital (2012). Furthermore, if the brain drain is caused by pull factors, that would also mean that the gains that some studies have associated with returned high-skilled migrants are likely only coincidental. However, if the brain drain is most of all the result of push factors—specifically bad institutions, poor policies, and a scarcity of social capital in sending countries, as I will argue here—then the apparent causal link between returned high-skilled migrants and economic growth may be no mere coincidence. Indeed, certain high-skilled migrants, in certain contexts (see Chapters VII-X)—with their cross-cultural knowledge, connections, political power, and entrepreneurial spirits—are uniquely positioned to transfer institutions, change policies, and integrate businesses with the global economy. As Acemoglu and Robinson attest, the brain drain does seem to be a result of nation failure, whether from external or internal causes (2012). However, the brain drain may be more complicated than simply a country's lack of robust institutions.
Referencing a number of studies, de la Croix and Docquier demonstrate “that a lack of economic growth, rampant poverty and correlates of poverty (bad institutions, discriminations, political repression, lack of freedoms, etc.) motivate people to flee their own country; with highly skilled workers found to be far more responsive to economic push-pull factors when compared to the low skilled” (2011, 2). Other research suggests that unhealthy institutions and government policies are not merely correlates of poverty but are causes of it (Acemoglu, Johnson, and Robinson 2001). These same unhealthy institutions destroy the ability for high-skilled workers to reach their full potential. Thein Oo, a high-skilled migrant at Tufts Medical University, opines, “many of my classmates in medical school [back home] have already given up medicine as a career and have become business men. A few are driving taxis to make ends meet” (Stein, et al. 2002, 219). Others confront a lack of the institution of venture capital, leaving them unable to finance their small and medium-sized enterprises (SMEs). For still others, the problems are not as much low-quality formal institutions or informal norms but a lack of social capital, a vital determinant of growth. Without social capital, SME entrepreneurs are unable to get their goods to developed markets, thus their countries’ economies lag and high-skilled workers leave. This chapter will address how institutions, geography, policies, social capital, and pull factors all play some role in the exodus of high-skilled migrants. While the mix of these factors is not the same for each nation affected by the brain drain, the pattern observed here is that at least three of these factors are significant contributors to the brain drain; and among all potential solutions, high-skilled migrants are most effectively equipped to combat these three core issues.

Institutions

In their book *Reversal of Fortune*, Acemoglu, Johnson, and Robinson (2002) argue that colonially imposed political and economic institutions have resulted in much of the poverty we see today. Yet a 2004 study citing evidence from South Korea, Taiwan, and China by Glaeser et al. (2004)
suggests that healthy political institutions are largely dependent on economic growth, not independent variables that impact economic growth. The study did not indicate that political institutions are not an important factor when economic growth is concerned, only that other mediating variables matter more (Glaeser et al. 2004). However, through the lens of the brain drain, human capital formation is essential to economic growth and is impeded by poor political institutions (Haque and Kim 1995). As Ansah explains, “The obstacles in the career path and growth of these professionals [are] limited internal mobility within the labor structure, lack of adequate equipment, limited political freedom and autonomy....” (2002, 22). Here, “Limited internal mobility within the labor structure” refers to a set of formal economic institutions or rules which govern societal behavior; the “lack of adequate equipment” refers to another kind of institution, hospitals or computer labs; while the last part of the sentence is meant to denote failed political institutions. These failed political institutions have led many migrants like Thein Oo to flee their countries (Adebayo 1985). Unhealthy economic and political institutions constrict people’s choices, limit their ability to attain a higher status within their communities, and block their ability to realize their potential. Hence, economic and political institutions are independent variables of the brain drain phenomenon.

Another important formal institution missing in many low-income countries is venture capital. The lack of venture capital constricts people’s choices and overall economic growth as well. Venture capital provides funding for small and medium-sized enterprises (SMEs) at early stages of growth when they otherwise would not get funding from traditional sources. Not only do venture capital firms finance entrepreneurs but they also provide mentoring and monitoring, adding value to organizations they support (Petreski 2006). The lack of access to these valuable resources offered by venture capitalists is likely a driving factor of the brain drain in two ways. First, as would-be entrepreneurs are unable to obtain funding and realize their business ideas, their countries are simply deprived of the economic growth those businesses would have generated, and as a result of this lack of growth, high-skilled workers of all kinds migrate. Second, a lack of venture capital leads entrepreneurs themselves to
leave their home countries in search of funding opportunities abroad.

Not all institutions are formal institutions. Corruption and systemic biases such as racial or tribal discriminatory norms are informal institutions are likely to also lead to the brain drain if they significantly impede the economy. As Kapuria Foreman points out, “economists believe that freely functioning markets facilitate economic growth. Corruption, by increasing transactions costs, can increase friction in an economy and slow its growth. In addition, corruption is particularly harmful if it is unpredictable - the additional costs of bribing officials and getting permits may increase uncertainty enough for many transactions to be abandoned” (2007, 143). Formal and informal institutions clearly matter, but what is their contribution to the brain drain compared to other determinants? The following sections explore various other determinants of the brain drain, including policies and social capital.

Policies

While weak institutional quality seems to fuel the brain drain, Henry and Miller examine the determinants of poverty (and by extension, the brain drain) through the lens of policies. “While institutions undoubtedly affect economic outcomes, the macroeconomic policies that governments choose to implement may exert just as much influence on the trajectory of their economies as the broader institutional framework within which those policy decisions take place” (Henry and Miller 2009, 261). They base this conclusion on their analysis of the divergence in living standards in Jamaica and Barbados over the last several decades. Figure 4 gives a startling picture of the ultimate disparity in incomes that has manifested since the two countries’ independence:
This dramatic difference in standard of living between the two countries, they argue, is due to policies not institutions. In a natural experiment, Henry and Miller begin their argument by demonstrating how much Barbados and Jamaica have in common. A natural experiment occurs when two objects (in this case, countries) with much in common (culturally, linguistically, geographically, etc.) are compared as one receives an intervention and the other does not. In this natural experiment, both are Caribbean nations with similar formal institutions handed down by the British, similar ethnicities, cultures, geographies, and economies. They had nearly indistinguishable starting points yet arrived at strikingly different outcomes.
According the Henry and Miller, sound economic policy is the 'intervention' that Barbados received and Jamaica did not. The economists trace Jamaica’s economic failure to macroeconomic policies implemented by the People’s National Party in the 1970’s, which focused on redistributing income through creating jobs, providing housing, and subsidizing food. These well-meaning social-democratic policies unfortunately sent Jamaica into a spiral of debt and skyrocketing inflation as investment collapsed (Henry and Miller 2009). Henry and Miller argue that some would blame Jamaica’s demise on the oil price shock of 1973 (Manley 1987). Yet Barbados, also subject to the same shock, implemented vastly different policies such as “monetary restraint, fiscal discipline, openness to trade, and ultimately wage cuts to restore competitive unit labor costs” (Henry and Miller 2009, 266). Thus, Barbados ended up achieving a much higher standard of living for its citizens. Henry and Miller conclude their argument by lamenting the unbroken focus of scholars on the long-term economic effects of institutions to the neglect of the effects of policy, which they say can exert influence on economic development just as much as “the institutional framework in which it is set” (2009, 266).

Since wage differences between sending and receiving nations, i.e. poverty, are a determinant of the brain drain (Rosenzweig 2006), and policies may influence a nation’s wealth as much as its institutions do, then it appears that poor policies are depressing economies, and in turn compelling high-skilled workers to migrate in search of better options. Chithelen and Souza (2005) add to this

---

**Table 1—Barbados and Jamaica Have Similar Economies**

<table>
<thead>
<tr>
<th></th>
<th>Barbados</th>
<th>Jamaica</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports as percent GDP</td>
<td>58.4</td>
<td>50.0</td>
</tr>
<tr>
<td>Imports as percent GDP</td>
<td>68.6</td>
<td>60.7</td>
</tr>
<tr>
<td>Agriculture as percent GDP</td>
<td>3.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Industry as percent GDP</td>
<td>18.0</td>
<td>33.1</td>
</tr>
<tr>
<td>Services as percent GDP</td>
<td>78.3</td>
<td>61.2</td>
</tr>
<tr>
<td>Population</td>
<td>300,000</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Area (square miles)</td>
<td>166</td>
<td>4,244</td>
</tr>
</tbody>
</table>

---

**Figure 6 Barbados and Jamaica Have Similar Economies**

**Source:** Henry and Miller (2009)
argument by contending that business-friendly policies in the United States make it much easier for foreign entrepreneurs to access capital through public equity markets and therefore to start a business. They posit that entrepreneurship among Indians in the U.S. is much higher than among Indians at home because of this factor. Hence, it may be safely assumed that unhealthy policies in poor countries are limiting entrepreneurs, who then migrate and find the means to realize their dreams in the developed world. Jean M. Johnson further bolsters this argument in her observation that “proactive programs and policies are often the most important appeal for expatriate scientists and engineers to return home and to apply their advanced training and research experience” (2002, 126). If Johnson is correct, then unhealthy policies would conversely be a reason why migrants left in the first place. While weak or absent institutions and poor policies are both significant determinants of the brain drain, there is one other factor that is generally overlooked in the scholarly literature on this topic: social capital.

Social Capital

In their study, “Country Ranking: Social Capital Achievement”, Ronald Lattin and Stephen Young provide us with a robust measurement for global social capital (2005). The authors use 13 indices to measure social capital, including such metrics as GDP Purchasing Power Parity, the Human Development Index, and the Freedom House Score. While countries with a high amount of brain drain do not correlate perfectly with low social capital (Barbados is ranked number 31 in terms of social capital—a good ranking—yet it is at the top of the list in terms of brain drain), most nations with high brain drain outcomes, such as Haiti, St Kitts, and Dominica, have low social capital rankings.

Why would poor social capital be a determinant of the brain drain? Various definitions for social capital exist, from social skills that allow people to profit from social interactions (Glaeser, Laibson, and Sacerdote 2002) to capital engendered by relational dealings (Coleman 1990). However, for the purposes of this thesis, social capital is "the sum of the resources, actual or virtual, that accrue to
an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu and Wacquant 1992). Drawing from Bourdieu Wacquant's definition, a nation may have good institutions and policies, yet if business owners do not have the necessary relationships and connections within their economy and to the global economy, they will find it hard to get their products to developed-country markets. Furthermore, a country’s weak global connections may mean that its business owners are not abreast of the rapidly shifting demands of high-income countries, as information gaps leave them behind the trends. Cheng and Mittelhammer reinforce this argument by stating, “the results [of the regression] indicate that control of institutional quality, social capital and openness, and investment in physical capital contribute significantly to income level” (2008) (emphasis mine). Social capital increases the potential for connection with the global economy and without it and the prosperity it can bring, a country's economy is more likely to lag and its high-skilled workers are more likely to leave.

**Other Determinants**

Pull factors and geography, as anthropologist Jared Diamond conceives them, are the most notable other factors contributing indirectly to the brain drain. In *Geography, Biogeography, and Why Some Countries Are Rich and Others Are Poor*, Diamond asserts that geography and biogeography are not simply mediated by institutions. Instead, they still exert a strong influence on living standards worldwide. They are significant determinants of income, “even when institutions are included in the multiple regression” (Hibbs, Olsson, and Diamond 2004, 3719). From an anthropological perspective, Diamond makes an excellent case for geography as an ultimate independent variable of living standards.

Though it is hard to argue that geography and biogeography haven’t affected the wealth of nations today, the natural experiments in the Korean peninsula and Nogales observed by Acemoglu and
Robinson, along with the natural experiment between Jamaica and Barbados documented by Henry and Miller, make a strong case against bio-determinism as a major determinant of the wealth of nations. Even Diamond himself, when asked about how Singapore and Malaysia were able to develop despite being malaria infested, acknowledged that government policy was able to carry these societies past their biogeographic limitations (PBS Interview 2005). The ultimate problem, then, is poor policy, not unfortunate geography. And policy, unlike geography, may be amended by high-skilled migrants.

Besides geography, scholars often name pull factors as the primary determinants of the brain drain. As former U.S. education secretary Arthur Flemming wrote in the 1950s: “Our educational system is not providing us with the number of well-trained scientists and engineers that we need today and will need in increasing numbers in the days that lie ahead,” suggesting that pull factors will intensify or at least remain constant (1956). And as Shachar notes in her recent article, “Highly Skilled Immigration: The New Frontier of International Labor Migration,” developed countries are “vying to outbid one another” in their race to secure talented individuals from the global south (2012, 1). Bloomberg News also corroborates the argument that pull factors cause the brain drain: “President Barack Obama’s immigration order will let U.S. companies temporarily hire more foreign college graduates even as it stops short of providing more of the H-1B work visas favored by technology companies” (qtd. in Miller and Hu). While corporations are not happy about this move because it does not raise H1-B or LPR visa quotas, “the training program...is probably the only thing Obama can do without Congress” (Miller and Hu 2014). Even a dysfunctional Congress cannot stop the U.S. from importing more STEM minds from abroad.

Pull factors clearly are partial determinants of the brain drain. Even if weak or missing institutions, bad policy, and lack of social capital are mostly to blame, the mere existence of free and rich nations abroad undeniably constitutes a pull. The pull these authors describe, however, is a conscious, greedy, and determined pull by wealthy nations on human capital from the global south. The likelihood of this demand going away seems very small, as Shachar and Flemming have pointed out.
Therefore, high-skilled migrants, or any group, are not likely to diminish this determinant. Nonetheless, while pull factors have not changed substantially over time, nations like Taiwan and Israel—once victims of the brain drain—have risen into high-income status, which signals the possibility that push factors may be mediated by the import of social capital, healthy institutions, and sound policies—all by high-skilled migrants.
VI. UNSUCCESSFUL METHODS OF COMBATING THE BRAIN DRAIN

Some approaches to the problem of the brain drain might suggest that it doesn't matter why it occurs, only that it is halted. Even if one or some combination of the possible determinants surveyed in the previous chapter could be identified as the ultimate cause of the brain drain phenomenon, couldn't developing countries simply reform their migration policies and forcibly retain their invaluable human capital? After all, policies were powerful enough to supersede the misfortune of Singapore and Malaysia's biography, so why couldn't restrictive migration policies stop the flight of high-skilled workers from their homelands? Developing countries may not even need to prohibit high-skilled workers from migrating; rather, it may be enough just to appeal to the better angels (or patriots) of their natures by imploring them not to abandon their countries and spend their talents in foreign lands. This chapter explores why neither moral suasion nor legal barriers against migration are successful methods of combating the brain drain.

Morally Persuading High-skilled Workers

The chanting from a large group of Brazilian doctors grew louder as their Cuban counterparts deplaned in bustling Sao Paulo. Heckling them they began to shout, “Esclavo! Esclavo! Esclavo!” “Slave, Slave! Slave!” Partnering with the Brazilian government in 2013, Cuba sent doctors to work in rural regions where Brazilian doctors were loath to go. Those areas were too dirty and poor, and they paid too little. The Brazilians called the Cuban doctors slaves because large portions of their salaries are captured by their government--and possibly to assuage their own guilt over refusing to sacrifice
their lifestyles to provide desperately needed medical services to fellow Brazilians (Watts 2013). Speaking from his metaphorical pulpit, Juan Delagado, a Cuban doctor who endured the taunts of his Brazilian co-professionals, remarked, “The Brazilian doctors should do the same as we do: go to assist in the poorest places.” (Watts 2013).

Few want to be defenders of the self-concerned, yet this account raises an important consideration: how effective is moral suasion against economic incentive? In other words, why weren't the Brazilian doctors, who unlike the Cubans had free agency, moved by moral or patriotic duty to serve their country's neediest patients? Is it that they are an especially selfish group of people, or is that their behavior an indication that moral suasion is a weak motivator in the presence of economic incentive? The authors of a recent study about electricity usage devised an intriguing means by which to answer this query. Koichiro Ito, Takanori Ida, and Makoto Tanaka compare the degree to which two groups of participants cut back their electricity usage when given one of two incentives to do so—the first moral and the second economic. The results are striking. While both moral and economic incentives were strong motivations for participants to curb their electricity usage initially, economic incentives sustained motivation whereas moral ones eventually lost effect (Ito, Ida, and Tanaka 2015). In fact, even after economic incentives were discontinued, those who participated in the economic incentive intervention continued their habit of lower electricity usage. Economic incentives, in other words, are reliable motivators of human behavioral change.
With such strong evidence of the superior power of economic incentive as a motivator, it seems that if developing countries want to stem the brain drain, they should give up propaganda campaigns highlighting moral duty and simply reward those who stay monetarily. Some countries have attempted this approach, but as Miyagiwa observes, economic-incentive-led policies such as the Bhagwati tax (which redistributes foreign-earned income to high-skilled workers who remained in country) and scholarships do not encourage the highest-skilled to stay, only those with intermediate skills (1991). According to this research, both moral and economic incentives have not been enough to outweigh the enticement of opportunities in developed countries. Indeed, high-skilled workers are more likely to respond to the greater economic incentives and the impulse for freedom from state-manufactured identities than to the combined moral and economic incentives their home countries may offer. Just as
the research of Ito, Ida, and Tanaka demonstrates that trying to morally dissuade high-skilled workers from migrating for better opportunities is often futile, so apparently is utilizing legal compulsion (2015).

The question of whether or not to bar people from migrating raises ethical arguments, prominent among them the individual right to migration. “Immigration restrictions unquestionably curtail individual liberty. For this reason, if no other, they require justification” (Oberman 2013, 428). Joseph Carens extends the philosopher John Rawls' conviction of that the “equal moral worth of all individuals” is primary to every other concern, specifically applying this ethic to individuals' choice to travel (1987, 269). Peter Meilaender (1999) concurs. Though Carens presents a somewhat compelling moral argument, the ideal of individual freedom may come to seem like an unaffordable luxury in the face of the very real suffering that is perpetuated through the brain drain phenomenon. To be convincing, critics of combating the brain drain through restrictive migration policies would need to show why such an approach would not be effective, not just that it may be unethical. Sealing the borders or morally compelling high-skilled workers to stay are not only largely ineffective tactics, they are also potentially counterproductive.

**Barring High-Skilled Workers from Migrating**

With the background noise of “Slave! Slave! Slave!” ringing in his ears, Delgado proclaimed to the media, “We are not slaves!” Yet he hardly speaks for all Cuban high-skilled workers, especially the 1,278 that recently escaped to the US from foreign countries like Venezuela where they were working. Many doctors like Manuel only make $20 a month (Lee 2014). The New York Times Editorial Board laments that U.S. pull factors are enticing Cuban doctors on important missions abroad to defect. They claim that Cubans are paid high salaries abroad by organizations like the UN, but according to Rep. Mario Diaz-Balart, “Cuban doctors are hastily trained, poorly equipped and forced to work in
dangerous conditions while most of their pay is siphoned to the Castro dictatorship” (emphasis mine) (Lee 2014, NYT 2014).

While neither imploring high-skilled migrants to stay on moral grounds nor simply forbidding them to leave seems very effective, interestingly enough, too few scholars have asked if there are any negative effects to combating the brain drain through persuasion or coercion. Given that human capital accumulation is almost universally recognized as a good thing, what bad could come of keeping high-skilled workers within the confines of poor nations? The answer: brain waste and rent-seeking, which lead to a vicious circle.

Rent-Seeking is the Result

Though the improved Solow Model: \( Y(t)=K(t)\alpha H(t)\beta (L(t)A(t))^{1-\alpha-\beta} \), is a widely-respected and very useful framework for understanding economic growth, it does not take into account the quality of institutions as determinants of success. In “Institutions, Capital, and Growth,” Hall, Sobel, and Crowley argue that increases in human capital do not always lead to growth when weak institutions are present (2010). They find that, “In countries with poor institutions...the higher returns to investments in rent-seeking activities that plunder the wealth of others, through lobbying and lawsuit abuse, for example - draw significant resources into these privately beneficial, but socially unproductive activities. Investments in education produce more lobbyists, politicians, and lawyers, rather than engineers and scientists” (2010, 387).

The research of Hall et al. is not alone in its findings about corruption. In her paper “Rent-Seeking Activities and the 'Brain Gain' Effects of Migration,” Peng (2009) agrees that brain drain may alleviate rent-seeking among high-skilled workers and move those who stay to engage in more productive activities, thereby improving the institutional quality of the nation. In other words, the brain drain may eventually solve the brain drain. Writing for the periodical *The Independent*, Nina Lakhani further bolsters the argument that halting the brain drain could be detrimental to low-income nations by
claiming that Cuban doctors regularly take bribes due to their low salaries (2010). Instead of offering evidence that halting the brain drain will lead to human capital increases and growth, these examples portray a scenario in which greater human capital produces only a vicious circle fueled by rent-seekers.

There is no evidence to suggest that human capital increases in low-income countries with weak institutions will always lead to destructive circumstances. Acemoglu and Robinson point out in Why Nations Fail that institutions may change through lucky events as unforeseeable as a war or a freak storm. Yet the evidence compiled here seems to suggest that it is likely that rent-seeking occurs in the presence of increased human capital and weak institutions, often immiserating an entire continent, as Easterly claims (2010).

Provisional Conclusion of the Determinants of the Brain Drain

Given the previous evidence presented, there seems to be no good reason to believe that imploring high-skilled migrants to stay in their countries of origin or chaining them to low-income jobs is an effective cure for the brain drain. High-skilled migrants often find a way to flee depressed economic conditions, even when their movement is constrained. Moreover, the studies above present a compelling argument against keeping high-skilled migrants in country, as they will be more prone to participate in rent-seeking (Hall, Sobel, and Crowley 2010; Easterly 2010). Since restrictive migration policies in less developed nations are neither viable nor desirable, identifying the root of the brain drain is important, especially if high-skilled migrants are uniquely able to counteract those determinants that make human capital within low-income countries more likely to produce rent-seeking and other circumstances detrimental to growth. The upcoming chapter provides an overview of brain circulation, the type of migrants likely to return home and the reasons why technology workers are the type of migrants uniquely positioned to help their countries develop.
VII. OVERVIEW OF BRAIN CIRCULATION

*Brain Circulation*

We cannot discuss brain circulation apart from considering the most prolific scholar on the issue, AnnaLee Saxenian (2001, 2002, 2007, 2008). Dr. Saxenian is the Dean of the School of Information at the University of California, Berkeley. She is also a professor in Berkeley's Department of City and Regional Planning. Her perspective on high-skilled migration is undoubtedly one of positivity. From Israel to Taiwan to India, Annalee Saxenian contends that the circulation of high-skilled migrants is making conditions for everyone better. In her article “Brain Circulation,” Saxenian (2002) argues that immigrant entrepreneurs based in Silicon Valley have started information and communications technology clusters in many different countries, in some cases adding greatly to economic growth. “As recently as the 1970s, only giant corporations had the resources and capabilities to grow internationally, and they did so primarily by establishing marketing offices or manufacturing plants overseas. Today, new transportation and communications technologies allow even the smallest firms to build partnerships with foreign producers to tap overseas expertise, cost-savings, and markets” (2002, 3 ). She goes on to say that migrants have taken advantage of the ICT revolution—and the fragmentation of production—and have created many businesses in the global south (2002).

These immigrant entrepreneurs know the customs of both sending and receiving countries. They gain valuable social capital in receiving countries by joining ethnic professional networks and then use that capital to launch businesses in their countries of origin. Sometimes they import institutions like venture capital (2002). The diaspora also influence macroeconomic policy in their
homelands (Docquier and Rapoport 2012). The lens through which Saxenian sees these men and women is evident through the language she uses to describe them: “The New Argonauts” after the mythical Greek sailors who joined Jason in search of the Golden Fleece (2002). These “heroic” New Argonauts exemplify the best of brain circulation, she claims. Brain circulation is not simply a matter of replacing a “lost” citizen in the home country (Chand and Clemens 2008, 1). Through the ‘value-added’ knowledge and experience that high-skilled migrants gain abroad, many who return to their home countries offer gains beyond what a high-skilled worker could offer her country if she had chosen to stay home (2008).

Rosenzweig and Biene have shown that the number of high-skilled returnees is substantially higher than was previously thought. Though this thesis relies mostly on Saxenian’s conception of brain circulation, it does expand it to include not just Silicon Valley workers, but also foreign students. In order to determine the most accurate number of foreign student return rates, this thesis draws on research by Rosenzweig (2006), who distinguishes between foreign students in the U.S. who stay and those who return home. Using data from the NIS (New Immigrant Survey), Rosenzweig divides the number of immigrants who have ever held a student visa by the total number of foreign students who have studied in the U.S. According to Rosenzweig, “Estimates indicate about 6 percent of the stock convert to legal permanent resident status, consistent with about 80 percent of students not becoming permanent resident aliens in the United States and presumably returning home with their new skills” (2006, 165). Clearly, the brain circulation of students is a robust phenomenon.

Which Type of Migrants Are Likely to Return?

Further data from the New Immigrant Survey (NIS) shows an important difference in the attitudes and possible life choices of high-skilled migrants. As is demonstrated in Figure 2, the NIS compares four groups of high-skilled migrants—non-F1 visa holders, former student visa holders, non-employment principal visa holders, and employment principal visa holders—to see if they plan to stay
in the U.S.

Figure 2 “Do you Intend to Stay in the United States the Rest of Your Life?”

Source: Rosenzweig (2006)

Figure 7
“Do You Intend to Stay in the United States the Rest of Your Life?”

A. Answers of Visa Holders Who Were Not F1
   Yes 79%
   Don't know 11%
   No 10%

B. Former Student Visa Holders’ Answers
   Yes 62%
   Don't know 22%
   No 16%

C. Non-Employment Principal Visa Holders’ Answers
   Yes 79%
   Don't know 11%
   No 10%

D. Employment Principal Visa Holders’ Answers
   Yes 80%
   Don't know 20%
   No 10%


Figure 2 shows that almost twice as many high-skilled migrants (38%) who received their tertiary schooling in the U.S. are likely to return home compared to migrants who were schooled at home—the true brain drain. This suggests that being educated in the U.S. rather than in their home countries provides an incentive for high-skilled migrants to return home, but it doesn't tell us what this incentive is. Universitas, which catalogs the leading global universities, may help answer this question. Universitas measures tertiary education by nation according to various standards of quality. Below is a
comparison of the educational quality of the U.S., China, and India.

**Figure 3** Score Results for 2014

*Source: Universitas 21*

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>India</th>
<th>United States of America</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>49</td>
<td>37</td>
<td>100</td>
</tr>
</tbody>
</table>

According to Universitas, the U.S. education system is twice as good as China’s and almost three times as good as India’s. These studies together seem to point out that migrants with lower-quality schooling are more likely to stay in the US while migrants who earn a high-quality education in the U.S. are much more likely to return home and bring their high-quality human capital with them. Just as an apple gains value each time it moves up a value chain, being plucked, washed, polished, then given a sticker,
so migration to a country with a higher quality of education adds value to a high-skilled migrant, which ultimately benefits the country of origin if a migrant returns or invests--and from the data outlined above, it appears that 'value-added' migrants are more likely to return home.

To comprehend the scope of brain circulation in the Indian community specifically, Min Ye--the academic coordinator of the Asian studies program at Boston University--and Saxenian provide some illuminating findings: “According to a survey of Silicon Valley’s Indian population conducted in 2002 by AnnaLee Saxenian, 38 percent of the Indian diaspora reported working in the software industry. Of these, 77 percent had one or more friends who had returned to India to start a company, 52 percent traveled to India on business at least once a year, 27 percent regularly exchanged information about jobs or business opportunities with those back home, and 33 percent regularly exchanged technological insights. In addition, 46 percent of those interviewed claimed to have been a contact for a domestic Indian business and 23 percent said they had invested their own money in an Indian startup; 10 percent had invested more than once” (emphasis mine) (2014, 185). No doubt the channels of Indian brain circulation are well-traveled.

Which Type of Migrants are More Likely to Make a Difference?

So having pinpointed the type of migrants that are most likely to return home and the pertinent data about Indian ITWs, the task at hand now is determining which type of migrant is most able to mitigate the brain drain—to put it another way, which type of migrant is most able to add to their country’s development so as not to contribute further to the brain drain? Information technology workers and scientists (broadly speaking) both those who return and those who stay, are best equipped to do so. All types of high-skilled migrants may be able to help address some determinant of the brain drain, but information technology workers (ITWs) are uniquely positioned to halt the brain drain in this digital economy.
VIII. INSTITUTIONAL TRANSFER

The Importance of Venture Capital

Entrepreneurs who seek out venture capital to start new companies or expand industry are rare. It takes an enormous amount of courage, tolerance for repeated failure, willingness to cooperate and compete, emotional and social intelligence, and potentially a little insanity in order to start a new endeavor (Robinson 2010). But most of all, it requires funding. Without the institution of venture capital, many high-skilled SME owners would not have been able to secure funding and link up their national economies with the global economy (Saxenian 2008). Brain circulation would have been impossible without it. And while not a sufficient condition for growth, it is a necessary condition for combating the core elements of the brain drain. Figure 9 shows overseas venture capital investment as a percentage of domestic investment, silencing the idea that venture capital is a local phenomenon.
There is a strong body of research advancing the argument that venture capital, with its support for entrepreneurs, innovation, and positive spillovers—or unintended impacts—is vital for economic growth. Keuschnigg opines, “It is widely claimed among economists that the existence of a sophisticated venture capital industry is a major factor behind America's ability to encourage and sustain technological innovation and growth” (2004, 239). Keuschnigg goes on to note that venture capital allows new firms to grow more quickly and thereby employ more people. Kortum and Lerner (2000) find that venture capital-backed firms are more innovative than other firms, producing higher quality patents, while Hellmann and Puri demonstrate that those firms are more aggressive and are better able to get their products to customers quickly (2000). Wasmer and Weil econometrically concluded that a small rise in venture capital-funded firms significantly reduced unemployment (2000). Thus, it is clear that venture capital has a major impact on economic competitiveness and growth.
Venture capital is not merely about financing. As Keuschnigg argues, “They add value to new firms, promote their professionalization, and induce them to behave more aggressively” (2004, 240). The mentoring role of venture capitalist firms is a key element that increases their value to entrepreneurs. Spillover effects from venture capital are also well documented. Samila and Sorenson argue that venture capital creates spillovers occur for two reasons: “First, would-be entrepreneurs anticipating financing needs more likely start firms when the supply of capital expands. Second, funded companies may transfer know-how to their employees, thereby enabling spin-offs, and may encourage others to become entrepreneurs through demonstration effects” (2009, 338). Sampsa Samila and Olav Sorenson also note in their research, “Our estimates...imply that investing in an additional [venture capital-backed] firm would stimulate the entry of two to twelve establishments—in other words, more new firms than actually funded” (2009, 338). Figure 10 shows highly significant results (p<0.01) for venture capital’s effect on birthing new companies, increasing employment within existing industries and other new firms, and raising the average wages. In fact, doubling venture capital-funded firms within a region correlates with a 0.60% increase in total employment and raises incomes by 1.79%.
**Figure 10** Impact of venture capital on Regional Economy: OLS Fixed Effects

*Source: Madhavan and Iriyama (2009)*

<table>
<thead>
<tr>
<th>Source: Madhavan and Iriyama (2009)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Table 3.---Impact of VC on Regional Economy: OLS Fixed Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>Ln Births</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Ln Patents (t - 1)</td>
</tr>
<tr>
<td>(0.0097)</td>
</tr>
<tr>
<td>Ln Population (t - 1)</td>
</tr>
<tr>
<td>(0.0783)</td>
</tr>
<tr>
<td>Ln VC Ctr First</td>
</tr>
<tr>
<td>(0.0042)</td>
</tr>
<tr>
<td>Ln VC Ctr All</td>
</tr>
<tr>
<td>(0.0003)</td>
</tr>
<tr>
<td>Year dummies</td>
</tr>
<tr>
<td>MSA fixed effects</td>
</tr>
<tr>
<td>MSA trend</td>
</tr>
<tr>
<td>$R^2$</td>
</tr>
<tr>
<td>Observations</td>
</tr>
</tbody>
</table>

Ravi Madhavan and Akie Iriyama posit that TTCs (Transnational Technical Communities--i.e. ethnic professional networks made up of high-skilled migrants to Silicon Valley) are carrier waves for the institution of venture capital (2009). Where venture capital was once thought of as a local phenomenon, now high-skilled migrants, through their professional ethnic networks, search for business opportunities in their countries of origin and use venture capital to create startups. Venture capital has truly gone global, carried on the current of the brain drain. Cheng and Mittelhammer write, “The findings suggest that the development of supporting local social and institutional conditions may be facilitating factors for allowing countries to benefit from greater economic integration” (2008, 885). Institutions like venture capital and the social capital accumulated by migrants abroad fulfill the role of “facilitating factors” that not only enhance economic development, but allow nations to integrate into the broader global economic community (2008, 885).
Institutional Transfer in Taiwan and Israel

According to Johnson, Taiwan succeeded in growing its economy through healthy economic institutions and policies as well as healthy political institutions (2002). Referencing Acemoglu and Robinson's work *Why Nations Fail*, Johnson argues that in addition to family, cultural ties, and the presence of free speech and democracy, migrants are drawn to return home by attractive teaching jobs at strong higher educational institutions and science and technology infrastructure that encourages innovation. To clarify, this is not to say that political institutions, such as democracy and civil liberties, were direct determinants of return migration, only that once some investment had begun to produce growth and economies had entered a virtuous circle, these political institutions blossomed and provided a climate which drew migrants back home. The cause of this original growth was the formation of information and communications technology clusters funded by venture capital imported from abroad (Saxenian 2001, 2007, 2008). Saxenian contends that the creation of a domestic venture capital institution was influenced by the Silicon Valley model where many migrants had lived and worked (2001). Citing Taiwanese migrants as an example, she notes, “Two Silicon Valley venture capitalists...established the second and third venture funds in Taiwan, after the initial government-sponsored Acer fund” (Saxenian 2001, 8). Luo and Wang also conclude that a large portion of Taiwan’s ICT companies were started by high-skilled migrants. The Taiwanese government even created Hsinchu Science Industrial Park, and institutions known as an information and communications technology cluster, as a meme based on what high-skilled migrants had seen in Silicon Valley (Saxenian 2001). After Taiwan imported venture capital and set up Hsinchu Science Park in the early 1980’s, domestic IT output skyrocketed as seen in figure 8.
Figure 12 Taiwan’s Domestic Output from 1981-1989

Source: National Youth Commission, Taiwan and Saxenian (2001)
But a discussion of institutional import by high-skilled migrants would be remiss without bringing Israel into the picture. In *The New Incubators*, Margulies explains how home-grown informal institutions—social norms or cultural traits—led to Israel’s adoption of entrepreneurship and import of venture capital: “Israel’s geopolitical position might not be enviable, but it has arguably cultivated cultural traits that are essential to entrepreneurship - creativity, risk-taking, a willingness to fail, and the inclination to question authority” (2011). As did Taiwan, Saxenian contends that Israel copied its information and communications technology clusters from Silicon Valley and that “a coalition of policymakers and overseas entrepreneurs and engineers...created Israel’s venture capital industry from the mid-1980s to the mid-1990s” (2007, 10). What has been the fruit of Israel’s adoption of the entrepreneurial tech industry? According to Saxenian, “Israel, with a population of just over 6 million, is home to more than a hundred Internet security and software-related technology companies that are
listed on NASDAQ, more than any other country outside North America” (2007, 1). Figure 14 shows Israel’s GDP increase since the import of venture capital while Figure 15 shows venture capital linked to startups in Israel.

**Figure 14** GDP per capita, USD, 1980-2013

*Source: Global Competitiveness Index*

![GDP per capita, US$ US$, 1980-2013](image)
Figure 15 Growth of Israeli Tech Startups from 1990 to 2008

Source: Avnimelech (2009)

Although Israel falls behind other advanced economies in some measures, it is far ahead in innovation which leads to permanent economic growth (Daveri et al. 2004).
And in contrast to India—where lack of access to capital is the single most problematic factor for doing business—in Israel, with its abundant financing, that problem is much less of an obstacle. Brain circulation in Israel is an older, more intense, and longer-lasting phenomenon than it is in India, so Israel has been more able to focus tackling other obstacles to conducting business.
Through government cooperation with foreign entrepreneurs, scientists, and engineers, Taiwan and Israel have seen remarkable economic growth as a result of importing venture capital from abroad. The next section will focus on India. India is a very large country and the effects of brain circulation are newer and more complex, thus it requires its own section.

**Institutional Transfer in India**

In discussing determinants of growth on which high-skilled migrants are having influence, it is impossible to cleanly separate institutions from policies. Nonetheless, this section will focus primarily on the agency of India's high-skilled diaspora in creating institutional change. The restrictive licensing requirements of post-colonial India, known as the 'License Raj,' stifled the Indian economy by hampering the creation of new businesses. There is no scholarly consensus as to whether the Indian diaspora played a strong role in dismantling the License Raj, and some scholars suggest that it was the
IMF that pressured the Indian government to dismantle it and that only afterwards did the diaspora make the liberal policies that replaced it effective through ethnic direct investment (Ye 2009). On the other hand, Khanna and Palepu provide some interesting evidence supporting the concept of an activist diaspora reforming institutions in their sending countries (2004). After explaining the role that the IT giant Infosys played in introducing new institutions to India—namely, sound corporate governance standards—they write that “exposure to global capital markets is a result, rather than a cause, of Infosys' decision to adopt world corporate governance standards. The proximate cause of the aspiration to good corporate governance at Infosys, in turn, is its need to attract talent with truly worldwide options, which in turn is necessitated by fierce global product market competition” (2004, 485). According to Khanna and Palepu, high-skilled migrants living in developed countries—the brain drain—are the causal variable in the adoption of robust institutions (corporate governance standards). And Khanna and Palepu further note that it is the diaspora that largely regulate the flow of global talent. In this case, a clear link is visible between the brain drain and institutional change.

Docquier and Rapoport contend that professional institutions like the National Association of Software and Services Companies (NAASCOM) had many high-skilled return migrants on their boards “raising the profile of the industry in India and abroad” (2012, 43). Professional associations are vital for networking and setting standards and NAASCOM seems to have fulfilled these requirements. But even more important than professional associations, Docquier and Rapoport assert that the diaspora lobbied the Indian government to alter policies to allow for the institution of venture capital to be established. The first section of this chapter demonstrated just how important venture capital is to economic growth. When companies are unable to secure funding from traditional sources, venture capital can prove vital, and can also provide mentoring and scaling SMEs, resulting in much job creation. A snapshot of the effect of the increase in venture capital firms after the 1991 reforms is shown in Figure 18, and the major industries attracting venture capital are listed in Figure 19.
Yet not all institutional change instigated in India by high-skilled migrants occurred at a macro-level. Saxenian contends that micro-level reform was very effective at setting an industry standard known as the “capability maturity model” (CMM), allowing for quality control and integration into the global economy (2008, 384). CMM was imported when a high-skilled migrant who studied at
Carnegie-Mellon University gave a lecture in Bangalore on this new standard. Business professors across India soon began emphasizing CMM and India now has more CMM-certified companies than any other country. Saxenian goes on to argue that similar micro-level reforms were enacted in other areas of the tech industry: “The best practice in software engineering processes was transferred to Indian firms as soon as the processes were developed” (2008, 385).

Still, many economic institutions such as regulatory quality and government effectiveness have declined in the last decade, as seen in Figure 16, which comes from Worldwide Governance Indicators. And the IEF finds only a small increase in overall economic freedom, as seen in Figure 21.

**Figure 20** Economic Institutional Quality Indicators

*Source: Worldwide Governance Indicators*
Yet while those numbers may seem grim, the Global Competitiveness Index provides us with a more nuanced understanding of the data and the significance of high-skilled migrants’ ability to import healthy institutions. Unlike the World Bank Governance Indicators or the Heritage Economic Freedom Score, the GCI provides each country with a score based on factors, institutions, and policies that are weighed according to a nation’s stage in economic development, since different stages necessitate different factors, policies, and institutions. For instance, nations start out as factor-driven with growth mostly coming from natural resources and low-skilled labor. At this stage, additions to physical capital yield very positive growth results, as was shown in the Solow Model earlier. Then nations transition to efficiency-driven economies which need human capital and technological readiness to grow. Since investment in capital \( (K) = \text{depreciation} + \text{population growth (n)} \), in this phase, the production function denoting growth won’t rise by simply increasing savings or decreasing population. Depreciation of capital will eventually outstrip investment in new physical capital, causing a waste of funds unless technological innovation is added to the mix. Finally, in the last stage, nations such as
Taiwan and Israel reach the innovation-driven stage or “high-income status.” Figure 22 details India’s developmental progress below.

**Figure 22** India’s Economic Stage of Development

Source: Global Competitiveness Index

At face-value, the GCI doesn’t seem to show anything better than the HEFI or the WGI. India scores low on macroeconomic environment and barely reaches an average score on infrastructure, yet has a higher score on innovation. Why does it matter if India is innovating when it has only a factor-driven economy that should, theoretically, just focus on infrastructure and macroeconomic environment? Because India is not ‘one.’ Rather, India possesses remarkable economic and demographic diversity. Rural Bihar may not need technological readiness or innovation, but Mumbai does, as it competes with global companies. In light of their separate linguistic and cultural identities and their very different stages of economic development, rural Bihar and booming Mumbai might as well be considered separate countries. And—drawing from W. W. Rostow’s famous configuration of the stages of economic growth—as Mumbai’s economy grows, it may pull human capital from the rural
areas and achieve growth for all (Rostow 1971). In this sense, not even the GCI is nimble enough to take into account the potential of ICT growth fueled by migrants. This newer approach is mirrored in Figure 23, which shows the list of current obstacles to doing business in India. At the top of the list is access to financing. Financing is India's major problem, and a lack of access to venture capital is a critical part of that equation. If India merely needed to focus on its macroeconomic environment and infrastructural development (both of which the government can do), there would be little need to emphasize the importance of private businesses’ access to venture capital. So, while Figures 22 and 23 appear to contradict each other, they are merely envisioning the situation from different angles.

**Figure 23** Most Problematic Factors For Doing Business in India

*Source: Global Competitiveness Index*

Access to venture capital is a great hurdle for India, but one that migrants have and may continue (or not) to address in the near future. The next section explores the role of India and China's high-skilled migrants in the monumental transformation of the Asian giants' economic policies.
IX. POLICY CHANGE IN INDIA AND CHINA

In 1991, the Indian bureaucracy suffered a catastrophic blow. After enduring the shame of having to ship off its gold bullion to the IMF to cover its debts, it now had to comply with the IMF’s liberalizing reforms by dismantling among the most entrenched sets of central controls regulating production ever envisioned: The License Raj (Weinraub 1991). Some argue with effect that liberalization efforts were implemented beginning in the early 1980’s under Rajiv Gandhi, but the happenings around 1991 are still largely regarded as significant. Before 1991, entrepreneurship suffered with entrepreneurs unable to get licenses for products unless they were well-connected. Even then, connections did not guarantee efficient business outcomes. As Infosys founder Narayana Murthy recalled the days of the License Raj, “It used to take us about 12 to 24 months and about 50 visits to Delhi to import a computer worth $1,500. Today, I don't need to go to anybody's office to import anything that I want. I can import a computer worth millions of dollars. See the difference? I think that the kind of inhibition that these permit [and] license laws brought into play, the kind of friction to business that these policies cost, is something that can only be experienced, it can't even be explained. It's difficult to appreciate” (PBS Interview 2001).

While no consensus exists as to whether or not economic growth in India post-1991 increased or decreased economic inequality—Bhagwati and Panagariya (2013) argues strongly that it hasn’t, while Dreze and Sen (2013) and many others insist that it has--there remains strong scholarly opinion by many that “the growth episode in India since the 1980s is not another instance of state-driven growth in Asia. Instead, it is the coincidence of the ready availability of new technologies and having
the skilled manpower that would be necessary to take advantage of these new technologies....The sustained growth that we have seen since the mid-1990s would clearly not have been possible without the liberalizing reforms of 1991. The importance of liberalization measures can be appreciated by imagining the counter-factual that India had stayed in its pre-reform state of constraints on entrepreneurial freedoms to invest and import. New technologies would not have diffused at such a speed and growth would have been much slower” (Kotwal, Ramaswami, and Wadhwa 2011). The liberalizing reforms brought inclusiveness to the economic sphere—a more level playing-field for businesses, fewer barriers to entry, and less cumbersome government regulations. And empirical evidence is a testament to this inclusiveness. In addition to the studies already discussed, a recent study from Wacziarg and Welch showed that overall, from 1950 to 1998 a 1.5% increase in GDP was attributable to trade liberalization (2003).

But what may be overlooked is the role that high-skilled migrants played in the liberalization reforms, specifically through EDI (Ethnic Direct Investment). Makki writes: “Foreign direct investment (FDI) and trade are often seen as important catalysts for economic growth in the developing countries. FDI is an important vehicle of technology transfer from developed countries to developing countries. FDI also stimulates domestic investment and facilitates improvements in human capital and institutions in the host countries” (2002, 795). It may be that the promise of major investment by its diaspora propelled India's economic liberalization forward. But can the particular contribution to growth of migrants' investments be isolated and evaluated? As natives of India, are these migrants better positioned to make profitable investments, as they know the language, culture, and geography better than foreigners? In a groundbreaking study, Min Ye of Boston University examines the role of EDI on economic growth and comes to several noteworthy conclusions. The study highlights the diaspora's remarkable success in capitalizing on the liberalization reforms in 1991. As Ye observes, “In explaining India’s economic liberalization since the 1990s, business empathizers argue that local entrepreneurs have been the liberalizing agents, while the government has been acting in the way of change. In
contrast, people associated with the state stressed bureaucratic initiatives and blamed domestic business for dragging the wheel of openness. The role of diasporas has been assumed as unimportant. This assumption is rather curious, as so many political and economic elites in India are educated abroad, and continue to have networks with institutions in the United States and U.K. In a way, they have been part of India’s diasporic population for some time” (2009, 5). Indeed, the role of India's diaspora in post-1991 investment and growth should not be underestimated.

While the Indian diaspora seems to have played a role in India's post-1991 growth by capitalizing on the reforms, Ye argues that “ties between local governments and diaspora” helped prompt the 1979 liberalization reforms famous for opening China up to the world and spurring rapid economic growth (Ye 2009, 399). Ye continues: “Diaspora communities provided a mix of ideas and resources favorable to liberal FDI policies. Through interpersonal interactions, diaspora actors persuaded local governments to practice FDI liberalization and lobby for central permission. They also influenced reformist members of the central leadership. With diaspora investors providing information, capital, and market access to southern China, a diffusion mechanism helped expand FDI liberalization to the rest of the country” (2009, 401). Clearly, the Chinese diaspora played a demonstrable role in their home country's liberalization. While the diasporas of these two Asian giants seem to have influenced policy change in their homelands in different ways—Indians more by making liberalization a success through their investments and the Chinese more by lobbying directly for liberalization—both diasporas have proved vital to their home countries' economic transformation.
X. ACCUMULATING SOCIAL CAPITAL

Social Capital

Perhaps the most neglected factor of high-skilled migration, due to the relative lack of research accorded to it, is the ‘social capital’ variable as both a cause and an effect of economic growth in sending countries. Social capital acquired by high-skilled migrants has played and continues to play a huge role in Taiwan and Israel's growth (Chen 2000). Drawing from the analysis above, it is possible that social capital played a role in forming policy and institutional change. Madhavan and Iriyama provide ample support for migrants as carriers of venture capital through their participation in Transnational Technical Communities (TTCs) (2009). Madhavan and Iriyama argue that migrants gain knowledge and experience of institutions in IT hotspots like Silicon Valley, which they then apply to their home countries. As mentioned, research into the effects of high-skilled migrants on economic development is new, but “there is some anecdotal evidence that the Indian diaspora, active as both entrepreneurs and as 'angels' or venture capitals in Silicon Valley, play a major role in stimulating US venture capitals to expand to India - exemplified by the presence and reach of organizations such as The Indus Entrepreneurs” (2009, 1244). Docquier and Rapoport write more authoritatively on the subject of social capital: “having personal experience abroad allows [Indian] entrepreneurs based in smaller cities, with weaker networking and financing environments, to gain access to business and financial opportunities through diaspora networks” (2012, 43). This results in a reversal of the previous status quo under the License Raj in which only the well-connected from big cities benefited from business (2012). Based on these findings it seems reasonable to assume that social capital acquisition led to a more level playing-field for businessmen in India—a more inclusive society and one that is less
likely see continued loss of human capital in the long run.

Perhaps the most important sources of social capital are ethnic professional networks. Saxenian argues that “diasporas, especially in the form of professional communities like the new Argonauts, can begin to connect suppliers and customers, producers and policymakers” (2008, 392). These networks, like SIPA (Silicon Valley Indian Professional Association), connect high-skilled migrants with each other and with their home countries, prepping them for investment. Ironically, this bonding together into ethnic networks may have arisen from American racism which excluded Indians from established networks.

Other findings suggest that the diaspora, through social networks, can reduce transaction costs associated with trade (Kapur 2010). Additionally, there is a diaspora effect in scientific innovation as knowledge flows are greater between people of shared ethnicities, even accounting for large geographic gaps that might make the transfer of ideas difficult (Saxenian 2007). It is impossible to quantify the amount of economic growth derived from Indian social networks, but research on EDI (Ethnic Direct Investment) may provide an understanding of the importance of investment by the diaspora which, given the evidence above, is likely tied to social networks. According to Ye, “Mauritius, a small island nation in Indian Ocean, has in fact been the second largest source of FDI [EDI] in India in the past three decades” (2009, 25). This statistic is especially significant given Mauritius’ small population and demographics.
But in order to understand the true impact of social capital on business creation among high-skilled migrants, it is important to transcend the abstract and theoretical. Arun Chandra Mohan, Praveen Sinha, Manu Jain, and Mukul Bafana all studied and worked abroad before coalescing to create “Jabong.com,” an internet fashion e-commerce site worth $450-$500 million in 2012. From their Linked-in pages, it is evident that these Indian nationals worked at a variety of companies in the West, from Rocket Internet to Bain Capital—a perfect example of the brain drain. Jain, Sinha, and Bafana also all worked at McKinsey & Co., and given that they speak different languages (some Bengali, others Hindi or Marathi, meaning that they may come from different areas of the Indian subcontinent), it is safe to assume that they may have made the connection that led to forming Jabong during their time abroad. Hence, the social capital vital for investing in this startup was likely accumulated as a result of their work abroad—another example of a positive contribution made by the brain drain. Figure 25 shows the increase in returning customers from 36% in 2013 to 51% in 2014—a hugely successful endeavor (Balanarayan 2014).
Figure 25 Jabong Returning Customers

Source: Medianama

Figure 26 also shows revenue for Jabong increasing 5,000% from 2012 to 2013, a time when Amazon was losing customers (Mishra 2014).

Figure 26 Jabong.com Revenue from 2012-2013

Source: Mishra (2014)

<table>
<thead>
<tr>
<th></th>
<th>FY12</th>
<th>FY13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Revenue</td>
<td>4.69</td>
<td>202.74</td>
</tr>
<tr>
<td>Net Loss</td>
<td>0.67</td>
<td>0.16</td>
</tr>
<tr>
<td>*Reserves and Surplus</td>
<td>0.67</td>
<td>0.83</td>
</tr>
</tbody>
</table>

* (excluding revaluation reserve) Source: RoC, MCA

Flipkart.com, a company worth $1 billion, and the $2 billion Inmobi.com are two other successful businesses built by high-skilled migrants (Rai 2014; Mishra 2014). Binny Bansal, one of the
founders of Flipkart, worked in New Jersey for two years at Sarnoff Corporation as a simple software engineer before returning to Bangalore to start his business. Naveen Tewari, the founder of Inmobi.com, studied at Harvard and worked at Charles River Ventures before gaining capital from Kleiner Perkins, Caufield & Byers to start InMobi in Mumbai. Though the data is sparse, the Linked-in pages of Bahl (founder of Snapdeal.com) and Bafana show connections in various ethnic professional groups mentioned by Saxenian (2008), as well as other networking groups such as “Michigan Wolverine Networking.” Though there is not enough data at this time to quantify the exact benefit social capital plays in investment, growth, and stemming the brain drain, participation in ethnic networks seems to have helped these high-skilled migrants in their ventures.
XI. CONCLUSION: HIGH-SKILLED MIGRANTS MAY BE A POWERFUL ANTIDOTE TO THE BRAIN DRAIN

There is substantial evidence presented in this thesis that overall, many high-skilled migrants have been a boon to their nations. But as Andres Solimano writes, “This is not to suggest that all developing economies are positioned to reap the benefits of brain circulation and peripheral entrepreneurship. This opportunity is benefiting countries that have invested heavily in higher education, typically technical education, and are politically and economically stable enough that immigrants will consider returning home to” (2008, 141). Rwanda is an example of a nation that is relatively economically stable, and invests heavily in ICT, yet where the political climate is repressive and unstable. Figure 27 demonstrates Rwanda’s overall economic stability as captured in the Heritage Index of Economic Freedom. It is high given the context of a recent, genocidal, civil war, and compared to the regional average.
Few migrants might wish to return and invest in such a repressive and unstable society. Yet for countries who have invested in higher education and who maintain political as well as economic stability, high-skilled migrants remain one of the greatest hopes for national transformation.

Whether they remain abroad or return home, high-skilled migrants are able to contribute in several critical ways to their home countries' development. First, they acquire social capital abroad—through industry hubs and ethnic professional networks—which they may pass on to business
connections in their home countries or, if they return home, may use to better market their own businesses to developed countries. Furthermore, high-skilled migrants may use social capital they acquire abroad when they return home to build companies with domestic target markets, just as the founders of the Indian e-commerce websites Flipkart and Jabong, discussed in Chapter X, seem to have done. As Docquier and Rapoport observe, “having personal experience abroad allows [Indian] entrepreneurs based in smaller cities, with weaker networking and financing environments, to gain access to business and financial opportunities through diaspora networks” (2012, 43). The access afforded to these entrepreneurs from smaller cities levels the playing field, creating a more inclusive business climate and ultimately bolstering economic development.

Second, migrants may influence the direction of policy in their home countries, as the Indian diaspora may have done in the 1991 reforms, and the Chinese seem to have done in the 1979 reforms. While the Indian diaspora seems to have played a role in making liberalization a success, Min Ye argues that “ties between local governments and diaspora” were the catalyst for the 1979 liberalization reforms that opened China to the world and instigated its phenomenal economic growth (Ye 2009, 399). As Ye explains, diaspora communities “provided a mix of ideas and resources favorable to liberal FDI policies” (2009, 401). Through personal connections, diaspora persuaded local government officials to open their districts to FDI and even to lobby the higher ranks of the Chinese central government for liberalizing reforms. In China, the causal link between high-skilled migrants (since low-skilled diaspora were not the ones creating large businesses) and policy change is clear. In India, it seems that the high-skilled diaspora exercised influence in policy change mostly by their active investment in their homeland once liberalization was underway. Their investments made the 1991 reforms a success. Even so, it seems that the Indian government may have had more confidence to implement the reforms because of their anticipation of Ethnic Direct Investment by the Indian diaspora.

Third, high-skilled migrants may import inclusive economic institutions like venture capital and information and communications technology clusters, which have the potential to galvanize significant
economic reform. As demonstrated in Chapter XIII, venture capital is a powerful facilitator of launching new companies, increasing employment within existing industries and other new firms, and raising the average wages. Thus, venture capital is vital for growth. In Taiwan, for example, two high-skilled returned migrants used venture capital to expand their country's government-sponsored ICT industry, helping make Taiwan a major information and communications technology hub and fueling the country's economic development. Scholars also observe that a large portion of Taiwan’s ICT companies were started by high-skilled migrants. And, as Saxenian points out, the Taiwanese government fashioned Hsinchu Science Industrial Park from high-skilled migrants' descriptions of Silicon Valley (2001). Saxenian also notes that Israel modeled its information and communications technology clusters on Silicon Valley and that its high-skilled migrants were integral to the creation of Israel's venture capital industry (2007). The result is that Israel, with a population of just 6 million, became an information and communications technology hub larger than any other outside of North America—dubbed Silicon Wadi.

In short, when high-skilled migrants bring or send certain knowledge and resources they acquire in developed countries—most of all, social capital, political capital, and venture capital—to their economically inclusive home countries, they may more than make up for the original losses of the brain drain. As developing countries implement these new ideas and institutions, their economies grow; this growth then stokes brain circulation, which reinforces these positive effects with more high-skilled returnees who are uniquely positioned and equipped to help their nations integrate with the global economy.

The brain drain itself could not be its own remedy if the phenomenon is defined by Rosenzweig’s narrow methodology, which counts only those who complete their tertiary studies in their countries of origin, set out for developed nations, and never return or invest. But the brain drain as most scholars envision it is in reality brain circulation—high-skilled migrants leaving the global south for the West, many of whom later return to or invest in their home countries. Conceived this way, it may very
well be an antidote to the drain of human capital from poor nations. There is no evidence to suggest that brain circulation will occur everywhere, but the fact that it has been effective in countries as diverse as Israel, China, Taiwan, and India suggests it is an antidote that could mitigate the human capital loss of poor countries that invest heavily in certain subsets of the STEM fields—in ITWs (information technology workers), not PCPs (Primary Care Physicians). To reiterate Solimano’s findings, “[brain circulation] is benefiting countries that have invested heavily in higher education, typically technical education” (2008, 141) (emphasis mine).

This thesis has shown that barring high-skilled workers from migrating is not only illiberal and potentially unethical, it is practically impossible (Lee 2014, NYT). Trying to morally oblige migrants to stay is also unlikely to be effective (Ito, Ida, and Tanaka 2015). And even if migrants are coerced or convinced to stay, this may exacerbate the determinants of the brain drain by increasing rent-seeking (Hall, Sobel, and Crowley 2010). The brain drain is not simply a result of pull factors, open borders, or selfish people; those are superficial determinants (Hibbs, Olsson, and Diamond 2004; Cheng and Mittelhammer 2008, 872; Henry and Miller 2009; Glaeser et al. 2004; Adebayo 1985; Kapuria-Foreman 2007). Rather, the brain drain seems to be caused by a dearth of inclusive economic institutions, bad macroeconomic policies, and a lack of social capital, as well as many other smaller factors. Each of these primary factors has been and continues to be mitigated by high-skilled migrants. Thus, the outmigration of high-skilled workers may very well be the best means of obtaining the necessary cures for the weak economic conditions that drive those migrants out in the first place. Among all options available to combat the drain of human capital from poor nations to developed ones, the brain drain itself may be the best antidote.
Migration Policy Implications

Due to the boon that high-skilled migrants can be to their countries of origin by venturing abroad and gaining social, venture, and political capital, it would seem that open developed-country borders would be beneficial to migrants’ home countries. Indeed, based on the evidence presented in this thesis, increasing visa quotas for high-skilled migrants—especially technology workers—may help poor countries develop, so long as those countries are equipped to benefit from brain circulation. Yet there is a recent and very intriguing development in the currents of high-skilled migration that may soon prove an exception to the conclusion that welcoming immigration policies in the developed world are contributing to development in the global south. In 2010, Chilean national and Harvard graduate Nicolas Shea, began a program entitled “Startup Chile” with the purpose of attracting entrepreneurs from all over the world to Chile with the promise of $40,000 and space to create their technology startups. Soon after, Startup Chile grew and was given the moniker “Chilecon Valley” after Silicon Valley, the mother of all information and communications technology hubs. Shea explains his reasons for starting Chileon Valley: “I saw smart people being kicked out of the United States because they couldn’t get visas to stay,’ he says. ‘And I thought: why not bring some of them to Chile?’” (Economist 2012).

Figure 29 The Lure of Chileon Valley; Source: The Economist 2012
The restrictive immigration policies of developed nations may actually be propelling a type of brain circulation that stands to benefit developing countries more than open developed-country borders could. It may be that restrictive borders in wealthy nations are indirectly fostering a nascent information and communications technology hub and venture capital industry in South America. If this trend continues, it would mean that more nations could benefit economically from high-skilled migration than would otherwise. But given the paucity of scholarly evidence as to Startup Chile's effectiveness and relationship to brain circulation, it is too early to tell what the true effect of wealthy-nation migration policies would be.

Future Research

Future research should include empirical data on multi-directional brain drain and social norm transfer by high-skilled migrants moving between diverse countries—especially between India, the United States, and Chile. For this second area of study, religious states such as Iran and Saudi Arabia may be especially useful subjects of research, since social norm change in these societies could prove significant, or conversely, where entrenched conservatism could prevent any social norm change from taking hold. There is also a need for more empirical data on the specific types of migrant (physician or computer scientist) who invest in their home countries, as well as on their investment activities at home while residing in the West. Furthermore, there needs to be an analysis conducted on the social and professional networking of high-skilled migrants in developed nations. With what networks do they associate themselves? Do they connect with groups in their countries of origin? Have their networks grown and if so, by how much? How might poor nations encourage social capital accumulation and nationalist sentiment among their diaspora? The answers to these questions would prove useful to a deeper understanding of the role diaspora may play in ending the brain drain.
REFERENCES


Pistone, Michele and John J. Hoeffner. 2007. *Stepping Out of the Brain Drain: Applying Catholic*


