

The Relationship between Brain Circulation and Industry Growth:
A Case Study of the Knowledge Services Industry in Sri Lanka

by

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Abstract

Brain circulation is critically important in the globalized and knowledge-based economy as returning skilled migrants are recognized as knowledge transmitters between the developed and the developing countries. Thus, the purpose of this study is to analyze the relationship between brain circulation and industry growth, with special reference to the Knowledge Services Industry (KSI) in Sri Lanka. The KSI is defined as a combination of Information Technology services firms, Information Technology enabled Services firms, and firms involved in Business Process Outsourcing or Knowledge Process Outsourcing.

I analyzed how skilled migrants respond to the growth of a particular industry by employing firsthand data collected through a survey of Returned Skilled Migrants (RSMs) and qualitative information from Returned Entrepreneurs (REs). In particular, the determinants and temporal nature of brain circulation were analyzed. Moreover, the transnational capital of the returned skilled migrants (RSMs) was analyzed.

I also analyzed the advantages of returnees when they start a firm in the home country and its effects on business expansion by employing two case studies. In addition, the effects of brain circulation on export performances, business financing, and diffusion of institutional know-how were analyzed. For this purpose, I employed firsthand data collected through a survey of knowledge services firms and case studies of two benchmark firms in the industry. Main findings of the dissertation are as follows:

First, extending the success stories of brain circulation beyond Taiwan, China and India, a significant flow of brain circulation, largely driven by pull factors, was observed within the KSI in Sri Lanka. Motivated by favorable conditions in the global outsourcing industry in the mid-1990s, REs have established the KSI in Sri Lanka. These REs are endowed with foreign education, working experience, and networking; in other words, they have greater “transnational capital” compared to the lower skilled employees who returned at the early

stage of industry growth. In contrast, highly skilled employees have returned following the growth trajectory of the industry.

Second, the temporal nature of brain circulation is kept but does not apply commonly to both skilled employees and REs. Entrepreneurs are less likely to return permanently compared to the skilled employees as the location has not been an obstacle to their investment activities. However, returned skilled employees tend to be more permanent returnees.

Third, the Sri Lankan case is significant since the KSI has benefited from brain circulation while most of the other sectors in the country are experiencing a significant brain drain. Therefore, I postulate that the country-specific nature of brain drain has transformed into an industry-specific process of brain circulation.

Fourth, through content analysis of the two case studies, the following areas were identified as potential advantages of the REs that contributes to business expansions and industry growth. These include: (1) establishing global startups, (2) use of co-worker networks to start firms, (3) export market orientation of the firms, (4) staying connected to the host country, (5) ability to raise seed capital from market sources, (6) use of innovative ways to finance business expansions, and (7) act as knowledge transmitters.

Finally, regression analyses confirmed that the export performance of REs' firms dominates that of locally grown firms due to the accumulated transnational capital. Further, those firms have a higher probability of raising capital from foreign sources compared to the local firms. Nonetheless, there was no significant difference between local firms and REs' firms in applying institutional know-how. Accordingly, REs' advantages in exporting knowledge services and raising capital through foreign sources have contributed to the recent growth momentum of the KSI.

Thus, developing countries can promote and facilitate REs to boost export performances and overcome domestic capital market imperfections that hinder the growth prospect of knowledge-based industries in those countries.

Keywords: Brain Circulation, Business Financing, Export Performance, Knowledge Services Industry, Push-pull Factors, Returned Entrepreneurs, Return Migration, Returned Skilled Employees, Sri Lanka, Transnational Capital

List of Abbreviations

ATC	: Advanced Technology Centers
API	: Applications Programming Interface
BCS	: British Computer Society
BOI	: Board of Investment
BPM	: Business Process Management
BPO	: Business Process Outsourcing
CBSL	: Central Bank of Sri Lanka
CEO	: Chief Executive Officer
CMMI	: Capability Maturity Model Integration
DCS	: Department of Census and Statistics
DF	: Demographic Factors
DMS	: Data Management System
EDB	: Export Development Board
EM	: Early Movers
ExEEMF	: Ex-Employees of Early Movers firms
FDIs	: Foreign Direct Investments
FITIS	: Federation of Information Technology Industry Sri Lanka
GDP	: Gross Domestic Product
HC	: Human Capital
HDI	: Human Development Index
IBM	: International Business Machines Corporation
ICT	: Information and Communication Technology
ICTA	: Information and Communication Technology Agency
ILO	: International Labor Organization
IOM	: International Organization for Migration

IOT	: Internet of Things
ISO	: International Organization for Standardization
IT	: Information Technology
ITeS	: Information Technology enabled Services
JKH	: John Keels Holdings
KPO	: Knowledge Process Outsourcing
KSI	: Knowledge Services Industry
LTTE	: Liberation Tigers of Tamil Eelam
LSF	: Lanka Software Foundation
MFs	: Motivational Factors
MNCs	: Multinational Corporations
NBQSA	: National Best Quality Software Award
NCE	: National Chamber of Exports
NELM	: New Economics of Labour Migration
OECD	: Organization for Economic Corporation and Development
OLS	: Ordinary Least Square
OSD	: Open Source Development
OSI	: Open Source Initiative
OSS	: Open Source Software
PC	: Personal Computers
REs	: Returned Entrepreneurs
RQAN	: Return of Qualified African Nationals
RSEs	: Returned Skilled Employees
RSMs	: Returned Skilled Migrants
SDGs	: Sustainable Development Goals
SF	: Social Factors

SG	: Second Generation
SLASSCOM	: Sri Lanka Association for Software Services Companies
SLIIT	: Sri Lanka Institute of Information Technology
SLIM	: Sri Lanka Institute of Marketing
T&G	: Textile and Garment
TOKTEN	: Transfer of Knowledge Through Expatriate Nationals
XML	: Extensible Markup Language
U.A.E.	: United Arab Emirate
U.K.	: United Kingdom
UNDP	: United Nations Development Program
UNESCO	: United Nations Educational, Scientific and Cultural Organization
U.S.A.	: United States of America
WHO	: World Health Organization
WEIF	: Web Services Invocation Framework
WSUP	: Wharton School of University of Pennsylvania
WTO	: World Trade Organization

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CHAPTER 1: Introduction

1.1 Background

The purpose of this study is to analyze the relationship between brain circulation and industry growth, with special reference to the Knowledge Services Industry (KSI)¹ in Sri Lanka. First, I analyze the determinants of brain circulation by focusing on how industry growth affects the returning decisions of the Returned Skilled Migrants (RSMs)² and how Returned Entrepreneurs (REs)³ and Returned Skilled Employees (RSEs)⁴ respond to industry growth. Further, I analyze the temporal nature of brain circulation and transnational capital⁵ of the returnees. Second, I analyze the effects of brain circulation, in particular, ways in which REs' advantage contributes to business expansions and industry growth in the home country. Then, I analyze whether the firms founded by REs perform better than locally grown firms in terms of export performances, business financing, and the diffusion of institutional know-how, which are the driving forces of the KSI in Sri Lanka.

The impact of cross-border migration on the development of home and host countries is well recognized in the global development agenda. The 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) have directly addressed migration and related issues in Target 10 of the SDGs as a way to “reduce inequality within

¹ KSI is defined as a combination of the Information Technology (IT) firms, Information Technology enabled Services (ITeS) firms, and firms involved in Knowledge Process Outsourcing (KPO) and Business Process Outsourcing (BPO) (Board of Investments [BOI], 2014). For a detailed discussion on each these terms see Subsection 3.4.1.

² In this research I define a migrant as a person who stay abroad more than one year, and a skilled migrant as a migrant who possesses tertiary-level education at the time of the migration. Accordingly, RSMs are migrants who returned to Sri Lanka after studied or worked abroad more than one year and possessed tertiary-level qualification at the time of returning to Sri Lanka. If multiple immigration and emigrations are observed, the returnee should have fulfilled the criteria by the last return to recognized as a RSM. For a detailed discussion on each these terms see Section 3.4.1.

³ REs are the RSMs who become entrepreneurs (own account worker, sole proprietor, partner, or director) of a firm incorporated or operating in KSI in Sri Lanka. RSMs may returned as entrepreneurs or become entrepreneurs after they returned to Sri Lanka.

⁴ RSEs is the RSMs who return to Sri Lanka either on temporary or permanently for employment.

⁵ Transnational capital is defined as "value added to human capital by time spent overseas, including foreign knowledge, technology, networks and resources" (Vanhonacker, Zweig & Chung, 2005, p. 3).

and among countries” (United Nations, 2018, p. 10). The Target 10.7 of the SDGs requires governments to “facilitate safe, regular, and responsible migration and mobility of people, including the implementation of planned and well-managed migration policies” (United Nations, 2017, p. 1). Introducing the Target 10.7 of SDG to the development agenda reflects rapidly increasing trends in cross-border migration across the globe in recent years.

In 1990, the estimated total migrants in the world was 155 million (United Nations, 2011). The number reached 173 million in 2000, showing an annual growth rate of 1.1 percent from 1990 to 2000, and the growth rate increased to 2.7 between 2000 and 2010 (United Nations, 2017). Cross-border migration, which stood at 220 million in 2010, reached 258 million in 2017, indicating a 2.5% growth rate per year (United Nations, 2017). In general, South-North migration accounts for a larger share of cross-border migration. In 2017, countries in the North accounted for 64 percent of global migration flows, and the remaining 34 percent was accounted for by the countries in the South (United Nations, 2017).

The impact of cross-border migration on the development of home countries is determined by two factors: 1) whether the migration is a permanent flow or a temporary flow; and 2) skilled categories of the migrants. South-South cross-border migration is characterized by temporary movements of low-skilled and semi-skilled migrants (United Nations, 2015). Therefore, home countries derive benefits by facilitating cross-border migration (Heng, 2013). On the other hand, South-North migration is characterized by a permanent flow of skilled people. For instance, in 2011, there were over 11 million tertiary educated migrants from Asia in the Organization for Economic Cooperation and Development (OECD) countries (United Nations, 2015). Permanent migration of skilled people, which is commonly known as brain drain,⁶ has historically been recognized as a development problem for the home countries (Bhagwati & Hamada, 1974; McCulloch & Yellen, 1975).

⁶ Brain drain is defined as “emigration of trained and talented individuals from the country of origin to another country resulting in a depletion of skills resources in the former” (International Organization for Migration [IOM], 2011, p. 15).

The negative impacts of brain drain on home countries are multifaceted (Bhagwati & Hamada, 1974; OECD, 2008). First, brain drain reduces the stock of human capital and thereby productive capacity of the home country. Second, brain drain creates a fiscal imbalance in the home country. If a country invests in education and provide education at a subsidized price aiming to enhance the stock of human capital of the country, government expenditure increases. If the skilled people leave the home country, the country might lose the potential income tax from the migrants creating a negative effect on government revenue. Therefore, attempts to invest in human capital while suffering from brain drain could make the fiscal deficit larger and larger in the home country. Third, brain drain creates a welfare loss to the home country when professionals such as heart surgeons, university professors, and structural engineers migrate to other countries as these professionals generate positive externalities to the society. Therefore, in recent years, brain drain has been an important issue in the international development agenda.⁷

Against this backdrop, the concept of brain circulation⁸ emerged in the late 1990s when Johnson and Regets (1998) observed a declining trend in the stay rate of foreign students in the U.S.A., in particular, from Taiwan, South Korea, China and India, the period between 1988 and 1996. Following this observation, many scholars started to claim that skilled migrants, who studied or worked in developed countries, are returning to capitalize the high-level opportunities in the home countries. In recent years, the concept of brain circulation has become a buzzword in the literature on migration of skilled people. So, the proponents of this argument claim that one-way flow of skilled migrants, brain drain, has transformed into a circular process of skilled migrants, brain circulation.

⁷ Some policy agendas and dialogs at various international platforms are; World Health Organization (WHO) policies on “Global code of practice on the international recruitment of health personnel” (Dayrit et al., 2008); United Nations dialogs on “Harnessing remittances and diaspora knowledge to build productive capacities” (United Nations, 2012); Target 10.7.1 of SGD that focuses on reducing fiscal burden of migration on home countries (United Nations, 2018).

⁸ I define brain circulation as a process of returning skilled migrants either temporally or permanently to pursue employment, entrepreneurial or investment activities in the home country. A detailed discussion of the definition is presented in Subsection 2.4.

Brain circulation is important for developing countries for several reasons. RSMs are aware of the local context, which is defined as the social values, cultural norms, language and institutional setting in developing countries (Saxenian, 2007). Therefore, RSMs are effective in transferring advanced knowledge accumulated in developed countries to developing countries. Endogenous growth theories recognize innovation as a key determinant of long-run growth (Romer, 1986; Lucas, 1988). Although developing countries are not innovative, in general, they can expedite the catching up process through successful technology borrowing from advanced countries and adaptation of “innovations through successful imitations.” Some economists regarded Multinational Corporations (MNCs) as a key infrastructure, which facilitates the transfer of knowledge from developed to the developing countries. However, it is argued that MNCs did not transfer key knowledge to developing countries but limited to standard or codified knowledge (Agunias, 2006). In contrast, RSMs can be faster and more effective than MNCs in transferring both explicit and tacit knowledge of technical know-how, institutions, emerging markets and business opportunities between distant economies (Saxenian, 2007).

Moreover, as Saxenian correctly noted, local context is a significant determinant of a successful business partnership between the developed and the developing country. If the MNCs do not understand the local context, the business relocation or the business partnership would fail as in the case of International Business Machine Corporation (IBM) that withdrew from India in the 1980s (Saxenian, 2007). Interestingly, RSMs, who are endowed with a perfect mix of local knowledge and global knowledge, have transformed the developing economies, such as Taiwan and Israel, into technology leaders. Therefore, brain circulation has emerged as a key instrument for promoting economic growth in the knowledge-based and globalized economy.

Scarce resources in the knowledge-based economy include an “ability to locate foreign partners quickly and manage complex business relationships across cultural and linguistic

barriers” (Saxenian, 2007, p. 5). Outsourcing of business processes from developed to developing countries, in particular, Knowledge Process Outsourcing (KPO) has been increasing at an exponential rate over the last decade (Blinder, 2006). Therefore, developed countries and fast-growing developing countries, which do not have enough skilled people to be employed in knowledge-based industries, are competing to attract skilled migrants from less developed countries. However, developing countries, in particular, those who have a large stock of skilled migrants such as China, India, Israel, and Sri Lanka are promoting brain circulation to capitalize on the growing opportunities to promote their transmission to the knowledge economy. Thus, it is necessary to understand the factors that motivate brain circulation in the context of developing countries.

Is industry growth a prerequisite for fostering brain circulation? Push factors such as economic stagnation, political instability, lack of proper employment opportunities and career prospects in the home country are significant determinants of the South-North migration of skilled people. Skilled migrants return to their home countries once their home countries moved up on the development ladder. Therefore, economic growth in the home country might be a necessary condition to promote brain circulation. In support of the above claim, some scholars attribute reverse brain drain in South Korea not to the policies implemented by the South Korean government promoting the reverse brain drain but to the rapidly growing economy (Agunias, 2006). However, it is evident that the business start-ups and subsequent rapid growth of the Information and Communication Technology (ICT) industry in Taiwan were significantly influenced by the presence of REs at the early stage of industry growth. These REs, who returned in an era when the economic growth of Taiwan was not so remarkable, helped to establish the ICT industry and to move up through the global value chain of the industry (Saxenian & Hsu, 2001; Saxenian, 2007). Similarly, early returnees have contributed to achieving a rapid growth of the Information Technology (IT) industry in Israel, India and China (Saxenian, 2007; Kenney, Breznitz & Murphree, 2013). Therefore, recent

success stories of brain circulation reject the necessity of a rapidly growing economy to promote brain circulation but highlight the industry-specific nature of the process. However, there is not enough empirical evidence to support the industry-specific nature of brain circulation.

I employ the KSI in Sri Lanka as a case study to analyze the industry-specific nature of brain circulation. Sri Lanka is recognized as a skilled-labour exporting country (Adams, 2003). The emigration rate of skilled people in the country was 28.2 percent in 2000 (World Bank, 2012), which was the third highest rate in Asia. Among these 28.2 percent of skilled migrants, 20.4 percent was residing in OECD countries (OECD, 2008), indicating a permanent outflow of skilled people. In addition, the share of the skilled migrants as a percentage of the total migrants has increased from 20 percent in 2000 to 35 percent in 2012 (Central Bank of Sri Lanka [CBSL], 2013).

The KSI in Sri Lanka achieved a rapid growth over the last decade and is expected to achieve US\$ 5 billion export revenue, generate 200,000 direct jobs and create 1,000 start-ups by 2022 (Sri Lanka Association of Software and Service Companies [SLASSCOM], 2014). In addition, the KSI in Sri Lanka has become a popular destination for Business Process Outsourcing (BPO) and KPO in the world. For instance, Sri Lanka was awarded the Outsourcing Destination of the Year-2013 by the National Outsourcing Association of the United Kingdom (U.K.) (CBSL, 2013). Moreover, the industry has attracted global giants in the IT and BPO sectors such as IBM, Microsoft, HP, HSBC, WNS, Moody's Analytics, Motorola, and IFS.

The KSI mainly utilizes skilled employees in the country. Thus, it has absorbed the skilled workforce in Sri Lanka that could have otherwise been part of the brain drain, a long-suffering problem of the country. Importantly, the industry is largely benefited by the presence of REs and RSEs. For instance, the largest firm that provides employment for more than 2,500 skilled employees in the industry was founded by a returned entrepreneur from the

U.S.A. Further, there were 232 RSMs working in 56 knowledge services firms in the KSI in 2013.⁹

Generally, Sri Lanka is suffering from brain drain while the KSI is rapidly growing and benefiting from RSMs. Therefore, the KSI in Sri Lanka can be considered as a unique case to examine the industry-specific nature of brain circulation.

1.2 Problem Statements

The process of brain circulation can generate positive outcomes for developing countries as argued by the proponents of the concept. However, there are various problems related to the concept of brain circulation that need to be addressed. I identify research problems in relation to the nexus between industry growth and brain circulation. First, innovation and knowledge have been identified as key determinants of the long-run growth by endogenous growth theories (Romer, 1986; Lucas, 1988). Therefore, direct and indirect investments in human capital are considered as prerequisites (Hayami & Godo, 2005; Todaro & Smith, 2009). However, investment in human capital itself does not help to achieve a rapid growth due to the migration of skilled people and lack of innovations. For instance, countries like Sri Lanka could not achieve a rapid growth despite its strong human capital base, mainly due to the migration of skilled people or brain drain. According to some scholars, brain drain has been transformed into a circular process of migration of skilled people, which benefits the home country and the host country. Then, what would be the implication of human capital theory for a country like Sri Lanka if the country is experiencing brain circulation?

Second, the proponents of the brain circulation concept claim that in contrast to the permanent and unidirectional flow of traditional brain drain, the modern flow of migration is characterized by more temporal and multidirectional flows of skilled migrants, which benefit both home and host countries (Gaillard & Gaillard, 1998; Johnson & Regets, 1998; Saxenian & Hsu, 2001; Wickramasekara, 2003; Teferra, 2005; Kuznetsov, 2006; Faodi, 2006;

⁹ Authors survey data (2013)

Saxenian, 2007). However, opponents of the argument claim that brain drain is still increasing (Zhang, 2003; Finn, 2003; Docquier & Rapoport, 2012). Moreover, the scope of brain circulation is not limited to the permanent type of returnees as it considers temporary returnees as a vital part of the process. Yet, some others criticize the contextual validity of the current flow of brain circulation given its temporal nature (Harvey, 2009). Moreover, Obukhova (2009) highlighted that the consequences of brain circulations for developing countries are still under debate, although its significance is widely accepted. Therefore, it is clear that the concept of brain circulation needs more empirical and theoretical findings to accept its general validity.

Third, the return migration literature is very much weak on the factors that determine North-South return migration of skilled people (Shin & Moon, 2018). Some of the factors are wage premium (Mayr & Peri, 2008), the ability of workers (Stark, Helmensteins, & Prskawetz, 1997), professional opportunities (Harvey, 2009), and non-economic factors such as social, cultural and family consideration (Gmelch, 1983; Harvey, 2009). However, the mechanism that promotes the returning of skilled migrants (brain circulation) from developed to developing countries still needs to be revealed (Harvey, 2009; Shin & Moon, 2018). Importantly, the effect of industry growth on the returning decision needs to be analyzed. On the other hand, some of the recent findings are based on the intention of skilled migrants in developed countries to return to their home countries (for instance, Harvey, 2009). However, it is uncertain whether intention would reflect actual behavior. It is more important to analyze the observed behavior rather than the intention of migrants to return. Therefore, empirical research is necessary to find the factors and mechanism that motivated the skilled migrants to return to their home countries.

Fourth, potential benefits of brain circulation are classified into three levels: micro, meso and macro (Iredala, Guo, & Rozario, 2003). The micro-level benefits of brain circulation are improvements in income, skill development, acquisition of capital, and improved socio-

economic status that have accumulated at individual, family, firm and community levels. The macro-level benefits include the impact of remittances on the balance of payment, human capital accumulation at the national level, and the contribution of migration networks on international trade. According to Iredala et al. (2003), the potential benefits at meso-level (industry or regional level) are not well-explained in the brain circulation literature. Some exceptions include Kale, Wield and Chataway (2008); and Obukhova, Wand and Li (2012). Kale et al. (2008) studied the impact of transnational knowledge transfers on growth of the pharmaceutical industry in India, whereas Obukhova et al. (2012) analyzed the power of local networks on firm performances of high technology firms in Beijing, China.

Brain circulation does not happen in isolation; it is industry specific as in the ICT industry in Taiwan and the KSI in India. Moreover, the same country might experience multidirectional flows of skilled migrants depending on the competitiveness of the industries. For instance, Canada is losing its best brains to the United States of America (U.S.A.) in many fields but at the same time, the country is experiencing brain circulation within the IT industry (Schmitt & Soubeyran, 2006). Thus, the country-specific nature of brain drain has become an industry-specific process of brain circulation. Therefore, to validate the impact of brain circulation on developing countries, industry-specific studies or meso-level studies are more useful than general studies on skilled migrants.

Fifth, in South Korea, Taiwan, and China, brain circulation has been driven by rigorous policy interventions of the respective governments (Yoon, 1992; O'Neil, 2003; Zhang & Kawabata, 2013). However, the same policy mix, which provides material and non-material benefits to the returnees, has failed in other countries. For instance, the "Return of Talent Program of Jamaica" that was implemented with the collaboration of the International Organization for Migration (IOM) could not attract and retain skilled migrants in some areas and positions where there were no high salaries, better working conditions; and safety and health facilities (Thomas-Hope, 1999). In contrast, brain circulation in India is emerging as a

market driven process with minimal government intervention. Policy makers in India had failed to fully exploit the overseas talent, even in the early 2000s, as there were no policy incentives to promote return migration to India (Saxenian, 2002).

Among several research issues highlighted regarding brain circulation, the present study mainly focuses on the relationship between brain circulation and industry growth. As I have mentioned earlier, the impact of the growth of a particular industry on the returning decision of skilled migrants has not been investigated. Moreover, the effect of returning skilled migrants on a particular industry's performance is an under-researched area. Therefore, a set of specific objectives are developed as follows:

1.3 Objectives of the Study

- i. To examine the determinants of brain circulation; returning decision of skilled migrants, in knowledge services industry; and to analyze the temporal nature and transnational capital of the returnees.
- ii. To examine the ways in which returned entrepreneurs' advantage contributes to business expansions and industry growth, and to analyze the effects of brain circulation on the knowledge services firms in terms of export performances, business financing and diffusion of institutional know-how within the firms.

1.4 Research Questions

In order to accomplish the objectives of the study, I seek to answer the following main research question by answering a set of sub-questions.

1.4.1 Main research question

How is brain circulation and growth of the KSI related?

1.4.2 Sub research questions

The main research question is addressed with the help of the following two sub-questions.

- i. What factors have promoted the brain circulation; returning of skilled employees and entrepreneurs, within the KSI in Sri Lanka? And what kind of skilled migrants have returned?
- ii. In what ways returned entrepreneurs' advantage contributes to business expansions and industry growth? And what factors have contributed to the export performances, business financing and institutional know-how of knowledge services firms in Sri Lanka?

1.5 Research Methodology

This dissertation relies on the integrated research approach, which is a combination of both quantitative and qualitative methods. This approach enables us to neutralize the inherent biases in a single method approach (Creswell, 2009). Two surveys, namely, the Survey of RSMs and Survey of Firms, were conducted to collect quantitative data. Survey of RSMs aimed at collecting data to analyze the determinants of returning decisions of the skilled migrants in the KSI in Sri Lanka, while the aim of the Survey of Firms was to collect data to analyze the effect of the presence of a returned entrepreneur in a firm on its performances.

Two main types of qualitative data were employed. To explore the factors that influenced the returning decision of the entrepreneurs, 10 successful REs were interviewed. In-depth interviews were conducted with the selected REs, or with representatives using semi-structured and open-ended questions. In addition, I selected two prominent firms founded by REs in the KSI in Sri Lanka as case studies to analyze the REs' advantage and its contribution to the business expansions and growth of the KSI in Sri Lanka.

I used five hypotheses to analyze the relationship between brain circulation and industry growth. Hypothesis 1 presumed that factors, which determine the returning decision of an entrepreneur should be different from that of a skilled employee. The REs and RSEs may respond to the industry's growth differently. The second hypothesis investigated the returning decision of the respondents; whether it is permanent or temporal. Hypotheses 1 and 2 was

tested to establish the relationship between industry growth and brain circulation using the survey data of RSMs.

Hypothesis 3 considered whether REs, who are endowed with transnational capital, would perform better than local entrepreneurs in terms of exporting their services. The fourth hypothesis considered whether the REs have a higher probability of accessing foreign sources for the financial need of firms. The uses of institutional know-how by REs and local firms were considered in Hypothesis 5. I analyzed the factors that have contributed to the business startups and rapid growth of the KSI in Sri Lanka. First, I employed two case studies of firms founded by REs to analyze the contribution made by these REs to expand their business activities and the KSI in Sri Lanka. Then, hypotheses 3 to 5 were tested using the firm-level data of the Survey of Firms. Chapter Four presents the research methodology in detail.

1.6 Significance of the Study

The present study is significant in several ways. First, the study reveals the motivational factors and characteristics of skilled returnees in the KSI in Sri Lanka. The return migration literature, which emerged in the early 1960s, is not clear about the mechanism that stimulates the return migration of skilled migrants, in particular, from developed to developing countries (Harvey, 2009; Shin & Moon, 2018). Thus, this study fills the gap in the literature focusing on the KSI in Sri Lanka. The findings are particularly important as RSMs play a significant role in a globalized and knowledge-based economy. They share technical knowledge, business contacts, information about new opportunities and new markets with the developing economies (Saxenian, 2002).

Second, the growth of industry may be a necessary condition for employees to make their return decision. However, entrepreneurs, in contrast, might not necessarily be keen on the growth level but instead more responsive to growing business opportunities in the home country. However, the literature does not distinguish the different characteristics of REs and RSEs. A notable exemption is Iredala et al. (2003) who distinguished the determinants of the

RSEs and REs in their study in four Asia-Pacific countries. However, the findings have been generalized using diverse but small samples, which include RSMs from all the three economic sectors, namely, agriculture, industry and services, and from both government and private sectors. The factors that motivated some of the returnees to become entrepreneurs in the intensely competitive KSI and the way they have overcome the natural impediments in developing country markets have not been explored. Therefore, the present study answers the research question in a way that sheds lights on the diverse factors that motivate both REs and RSEs within KSI.

Third, a large volume of brain circulation research is based on the two incomparable economic giants; China and India. The two economies have a significant advantage due to the large domestic market and workforce, which most of the other developing countries are not endowed with. As Obukhova et al. (2012) stressed, research outside of China is needed to validate the concept of brain circulation, and assess the impact of REs, in particular. Therefore, empirical evidence from other countries is necessary to enhance the general validity of the concept of brain circulation. Findings of the present study can be generalized to other developing countries as Sri Lanka does not have the so-called size effect.

Fourth, the proponents of the concept of brain circulation claim that brain drain has become transformed into a process of brain circulation. Contrary to the country-specific discussion of brain drain, brain circulation has emerged as an industry-specific phenomenon. For instance, Schmitt and Soubeyran (2005) highlight how the IT industry in Canada benefited from brain circulation while the country suffered from brain drain, in general. Accordingly, annual migration of skilled migrants from Canada to the U.S.A. between 1997 to 2002 was over 70,000 individuals, on average. Interestingly, for the same period, about 30,000 skilled migrants returned annually from the U.S.A. to Canada and the RSMs were predominantly employed in the IT industry in Canada (Schmitt & Soubeyran, 2005). More precisely, a particular industry can gain from brain circulation when the country, in general, is

experiencing a brain drain in other sectors. Therefore, the present study provides a significant contribution to validate the industry-specific nature of brain circulation.

Fifth, the study further contributes to the current debate on the performance of REs compared to local entrepreneurs. According to the existing literature, REs underperform more than their domestic counterparts due to institutional factors, lack of local social networks and mismatches between the new venture and the institutional environment in the home country (Chen, 2008; Wang, 2014; Obukhova, 2009; Obukhova et al., 2012). However, this is surprising given the human, physical and social capital they accumulated during their overseas stay (Saxenian & Hsu, 2001; Saxenian, 2002). Most studies that support the former claim draw on Chinese cases. Therefore, the present study analyzes the performances of REs and local entrepreneurs in the KSI in Sri Lanka.

Sixth, lack of data on RSMs has hindered the ability to assess the impact of brain circulation over time. Most scholars have applied a qualitative framework to emphasize the contribution of brain circulation, hence, they are vulnerable to critics on the general validity of the brain circulation process. The present study applies both quantitative and qualitative approaches to answer the research questions, using the first-hand data collected through surveys and case studies.

Finally, the KSI in Sri Lanka has achieved an impressive growth over the last decade while most of the other industries in the country were stagnant. The industry has benefitted from brain circulation, largely due to the strong presence of REs. However, this is the first attempt to explore the factors that have contributed to its rapid growth. In particular, I examine whether the advantage of REs, i.e. exporting knowledge services and raising foreign capital, is the driving force of the industry's growth. According to Saxenian (2007), and partly supported by Kenney et al. (2013), RSMs have played a significant role in the initial establishment and subsequent growth of the IT industry in Taiwan. The story is very much

similar in countries such as Israel, India and China. Therefore, further empirical evidence would help to establish and generalize the concept of brain circulation.

1.7 Organization of the Dissertation

The rest of this dissertation is organized as follows. The term “brain circulation” is becoming a buzzword in the literature on skilled migrants. At the same time, it is emerging as another confusing concept in the development economics field. Thus, Chapter Two considers the emergence of brain circulation, its determinants and effects on industry growth.

In Chapter Three, the KSI in Sri Lanka is presented to explore the industry-specific nature of brain circulation. Sri Lanka, in general, is experiencing a severe brain drain. This is significant in areas such as health, management accounting and science. Therefore, at first, I explore the trends in migration of skilled people in Sri Lanka. In contrast to the general pattern in Sri Lanka, KSI is experiencing a beneficial brain circulation due to the presence of a large number of REs and RSEs. Moreover, it has experienced a lower attrition rate among its skilled employees. Additionally, the growth trajectory of the industry is presented in the chapter.

Chapter Four presents the methodology of the research. Most of the previous studies on brain circulation have applied a qualitative framework to explore the phenomena. Since most aspects of brain circulation are yet to be explored, in-depth analysis using qualitative tools still has great relevance. In addition, it is necessary to apply quantitative tools to verify the generalizability of some aspects of brain circulation. Therefore, I employ both quantitative and qualitative methods to overcome the limitations of a single method research.

In Chapter Five, I analyze the determinants of brain circulation, its temporal nature and the transnational capital of returnees. In the sub-sections, brain circulation was analyzed using the push-pull framework and the micro-meso-macro framework with special emphasis on the impact of KSI growth on brain circulation. In contrast to the policy driven process of brain circulation in countries such as Taiwan and South Korea, the Sri Lankan case has emerged as

a market driven process with few policy interventions. The chapter ends with a discussion on how growth in the KSI contributed to the return of entrepreneurs and skilled employees in Sri Lanka.

In Chapter Six, I analyze the ways in which REs' advantage contributes to business expansion and industry growth by employing two case studies of the firms founded by REs. Then, I explore how REs contributed to exports of knowledge services, to solve the capital market imperfections in Sri Lanka and impart the institutional know-how within the knowledge services firms in Sri Lanka. The chapter highlights the importance of transnational capital accumulated by REs through their foreign education, working abroad and networking to outperform their local counterparts. Moreover, the chapter explains that the transnational capital of the REs has positively affected the probability of generating funds from foreign sources. Nonetheless, there was no significant difference between REs firms and locally grown firms in applying institutional know-how. The chapter ends with discussions on how the REs' advantages in exporting knowledge services and raising foreign capital contributed to the rapid growth of the KSI in Sri Lanka.

The dissertation ends with the conclusions and discussions on policy implications in Chapter Seven.

CHAPTER 2: Evolution, Determinants and Effects of Brain Circulation

2.1 Introduction

This chapter reviews the literature on migration of skilled people, its evolution up to the current debate as to whether it is a brain drain or brain circulation; and determinants of brain circulation and its effects at industry level. In contrast to neoclassical economics, endogenous growth theory recognizes innovation and knowledge as two of the key determinants of long-run economic growth (Romer, 1986; Lucas, 1988). On the other hand, development economists identified direct and indirect investments in human capital as a pre-requisite to achieve a rapid growth (Hayami & Godo, 2005; Todaro & Smith, 2009). Public and private investments in human capital, particularly in knowledge-intensive industries, enhance productivity and generate positive externalities (Todaro & Smith, 2009), which contribute to increasing scale economies in the long-run.

However, investment in human capital has failed to boost economic growth in developing countries due to two main empirical observations. First, planned economies such as Russia and Cuba could not achieve rapid growth despite their heavy investment in human capital (Hayami & Godo, 2005). This has been explained as a result of lack of innovations.¹⁰ Second, due to migration of skilled people, many developing countries, particularly in Asia, have failed to achieve a rapid growth despite extensive investment in human capital. For instance, until recently, Sri Lanka failed to achieve economic take-off despite a high level of human capital.

Therefore, it is important to understand the current discussion on migration of skilled people, as it significantly determines the effectiveness of investment in education to achieve a long-run growth. Section 2.2 reviews definitions and trends in migration of skilled people.

¹⁰ As Hayami and Godo (2005) argued, investment in education and research is necessary, but, Schumpeterian type innovations are the sufficient condition to achieve a rapid growth (185). Refer section 6.3.3 of Hayami and Godo (2005) for more explanations on this argument.

Evolution of the literature on migration of skilled people is discussed in Section 2.3 and in Section 2.4, problems in defining brain circulation are presented. Sections 2.5 and 2.6 present the determinants and effects of brain circulation, respectively. Section 2.7 presents the analytical framework of this research followed by chapter a summary in Section 2.8.

2.2 Migration of Skilled People

Human capital formation exaggerates the economic growth of countries that have stagnated at the lower level of the development ladder. However, as highlighted above, many countries have failed to reap the benefits of investing in human capital due to migration of skilled people. According to the neoclassical arguments, unfavorable domestic conditions (push factors) and favorable international conditions (pull factors) are the main causes of such out migration of skilled people; a phenomenon known as brain drain (Castles and Millar, 2003). In contrast, the New Economics of Labour Migration (NELM) conceptualizes migration as a way to overcome market failures and mitigate income risks under the condition such as poverty (Haas, 2011). The following subsections present the working definition of skilled migrants and recent migration trends of skilled people.

2.2.1 Who are skilled migrants?

To begin with, the long-term migrant is defined as “any person who changes his or her country of usual residence at least for one year” (United Nations, 2011, p. 1). If the duration of overseas stay is more than three months and less than one year, such migrants are identified as short-term migrants. However, in the context of migration of skilled people, scholars employ different criteria to define a migrant. For instance, Anh (2003) defined a person as a migrant if he/she has stayed abroad for less than one year, whereas Kenney et al. (2012) employed two years overseas stay as the criteria to define a migrant. Nonetheless, in practice, many countries follow the United Nations guideline to define a person as a migrant who stays abroad for at least one year (United Nations, 2011).

Then, who are skilled migrants? Docquier and Rapoport (2012) defined skilled migrants narrowly by referring to the migration of skilled professionals such as engineers, physicians, scientists and accountants. On the other hand, others have used the term skilled migrants more broadly by referring to the migration of individuals, who have achieved any tertiary-level educational qualification (Koser & Solt, 1997; Iredale et al., 2003; Saxenian, 2005). These differences in defining skilled migrants have made the comparability more difficult within the literature on skilled migrants.

As the glossary of IOM also claims, there is no internationally agreed definition on skilled migrants. However, as Koser and Solt (1997) correctly pointed out, defining skilled migrants reflects mixed views that stand on qualifications-based and skills-based arguments. In general, following the qualifications-based argument, a skilled migrant is defined as a migrant with tertiary or equivalent qualification. In some cases, the “qualification” is further narrowed to a particular qualification such as a doctor, an engineer or an accountant. According to the skills-based argument, most skilled migrants do not have paper qualifications, but only the experiences. Thus, having a degree or a tertiary level academic qualification does not guarantee that a migrant possesses the required skills to perform a job in the destination country, which may require a high-level of expertise (Koser & Solt, 1997). The IOM’s definition of highly skilled migrant has provisions for both arguments. Accordingly, a highly skilled migrant is defined as “a person with tertiary education, typically an adult who has completed at least two years of postsecondary education” (IOM, 2011, p. 46). Further, it defined the term more specifically: “a highly skilled migrant is a person who has earned, either by tertiary level education or occupational experience, the level of qualifications typically needed to practice a profession” (IOM, 2011, p. 46). In addition, the IOM introduces another definition of a qualified person as “an expatriate national with specific professional skills in demand in the country or region of origin” (IOM, 2011, p. 77). Although it is theoretically appealing, the subjective nature of skills-based definition has hindered its

applicability in empirical studies. In contrast, the qualifications-based definition is more objectively verifiable.

Based on the discussion above, this study uses the definition of migration of skilled people as the **migration of individuals to stay abroad for more than one year**. In addition, **a migrant should have achieved any tertiary or equivalent qualification at the time of migration to be considered as a skilled migrant**.

2.2.2 South-North migration of skilled people

The trend of the migration of skilled people has increased at a faster rate than international trade and can be regarded as another aspect of globalization (Docquier & Rapoport, 2012). In general, South-North migration accounts for a larger share of cross-border migration, which is characterized by permanent flows of skilled people. For instance, in 2011, there were over 11 million tertiary educated migrants from Asia in OECD countries (United Nations, 2015). Most Asian countries suffer from a high rate of brain drain. For instance, in the year 2000, the migration rate of skilled people¹¹ were 37.2 percent in Laos, 29.6 percent in Hong Kong, 28.2 percent in Sri Lanka, and 27 percent in Vietnam (World Bank, 2012). In addition, over one million skilled migrants were recorded in the Philippines and in India (Adams, 2003).

Developing countries need to produce skilled individuals with different capabilities to be utilized in the country's development process. Hence, skilled people in a country, irrespective of their disciplines, are equally important to achieve an accelerated growth. Therefore, negative consequences that arise from migration of skilled people are not confined to a specific profession or category, but will affect economic growth and development, in general. Nonetheless, some skilled individuals could be more important than others in addressing short-term national objectives.

¹¹ I define migration rate of skilled people as the emigration rate of tertiary educated as a percentage of total tertiary educated stock in the home country (World Bank, 2012).

Permanent out-migration of skilled people, which is commonly known as brain drain, has historically been recognized as a development problem for the home countries (Bhagwati & Hamada, 1974; McCulloch & Yellen, 1975). Therefore, in recent years, scholars, international organizations, and policymakers have attempted to find remedial measures for brain drain. For instance, the “Return of Talent” program of Jamaica, which is supported by the International Organization for Migration (IOM), is aimed at bringing back overseas Jamaicans by providing various benefits. The “Transfer of Knowledge Through Expatriate Nationals” (TOKTEN) program of the International Labor Organization¹² (ILO) is a similar initiative to minimize the negative effects of South-North migration of skilled people. In Africa, the “Return of Qualified African National” (RQAN), which is another project supported by IOM, also serves the same purpose (Dzvimbo, 2003). In addition, various policies have been implemented by respective governments to promote return migration. In order to consider whether brain drain has positive or negative effects for the home countries, Section 2.3 reviews the evolution of migration literature on skilled people.

2.3 Evolution of Literature on Skilled Migrants

Although there were many disputes over the definition of skilled migrants and other matters, the main theoretical debates on brain drain have mainly focused on the impact of brain drain on the home countries.¹³ In the early period of the debate, in the 1960s, the theoretical justification favored brain drain. It was believed that it enhances the overall welfare of the world (for example, Grubel & Scott, 1966; Johnson, 1967; Berry & Soligo, 1969). The first wave of the brain drain literature drew on the principles of perfect competition and laissez-faire market structure in which all markets are cleared at the equilibrium. Therefore, brain drain produces the best outcome at the global level by

¹² The program was initiated as a counter measure against brain drain in 1977. More details of the program are available at ILO (2014).

Available at http://www.ilo.org/dyn/migpractice/migmain.showPractice?p_lang=en&p_practice_id=26

¹³ It is common to use the term either home-host country or sending-receiving country to identify the two countries involve in the migration process. In this study, I employ the former, which refer home country as the country of origin of the migrant and host country as the migrated country.

increasing world income in a Pareto optimum manner; no harm to the home country but increasing income in the host country and the world as a whole (McCulloch & Yellen, 1975). However, the pioneering work by Bhagwati and Hamada (1974) highlighted that the home country could experience a welfare loss if the private marginal product of the skilled migrant is less than the social marginal product due to the strong positive externalities in some professions. Therefore, the migration of professionals such as doctors and university professors generate a welfare loss to the home country. Moreover, for the same reason, brain drain negatively affects overall productivity and wages.

In the second wave of the literature, more analyses were carried out by incorporating market imperfection, in particular, unemployment, selection bias in investment in education, and imperfect information (Bhagwati & Hamada, 1974, 1975; see McCulloch and Yellen, (1975) for a different specification than Bhagwati and Hamada (1974)). The general conclusions are as follows: First, brain drain widens the gap between the North and the South making rich countries richer at the expense of poor countries. Second, it leads to an overall human capital reduction in the home county. Therefore, brain tax, either being borne by the migrant or the host country, was proposed as the remedial measure to neutralize the welfare losses to the home country (Bhagwati & Dallalfar, 1972).

According to Hua (2011), the third wave of the brain drain literature emerged with findings contradictory to the second wave. Potential skilled migrants invest in higher education under imperfect information about the labor market in developed countries and uncertainty in migration. The process of private investments in higher education, therefore, creates winners and losers. Winners become a part of brain drain while losers contribute to human capital accumulation in the developing country (Stark, et al., 1997; Docquier, Faye, & Pestieau, 2008). Therefore, brain drain under uncertainty in migration enhances human capital accumulation in the home country.

The present discussion or the fourth wave of the literature on skilled migrants is moving to another direction, claiming that brain drain would be transformed into “brain circulation.” Proponents of the argument claim that, in contrast to the permanent and unidirectional flow of traditional brain drain, the modern flow of migration is characterized by more temporal and multidirectional flows of skilled migrants, which benefit both home and host countries (Gaillard & Gaillard, 1998; Johnson & Regets, 1998; Saxenian & Hsu, 2001; Wickramasekara, 2003; Teferra, 2005; Kuznetsov, 2006; Faodi, 2006; Saxenian, 2007). However, the opponents of this argument claim that the conventional form of brain drain is still increasing (Zhang, 2003; Finn, 2003; Docquier & Rapoport, 2011). According to Zhang, more than 86 percent of Chinese student emigrants to the U.S.A. between 1978 and 2001 have not returned to the home country (2003, 80). Further, Finn (2003) found that the “stay rate”¹⁴ of foreign students in the U.S.A. has increased from 67 percent in 1998 to 71 percent in 2001. Therefore, in contrast to the temporary flow of brain circulation, “permanent types of migration of skilled people need to be placed in the context” (Harvey, 2009, p. 493). Further, Harvey (2012) explained brain circulation as a process of moving skilled migrants, not only between the host and the home countries but also among other countries for business, employment or investment purposes. Thus, it rules out the two-country focus of the brain drain literature. Therefore, more empirical evidence and theoretical explanations are warranted to validate the concept of brain circulation. However, there is no consensus among scholars regarding the definition of brain circulation. Section 2.4 addresses this issue.

2.4 Brain Circulation: Another Vague Concept

Although the circular nature of migration skilled people was observed by some early writers (Zelinsky, 1971 as cited in Jons, 2009, p. 2; Gaillard & Gaillard, 1998), the term brain circulation was first proposed by Johnson and Regets in 1998. Observing a declining trend in

¹⁴ The stay rate can be defined as the percentage of skilled migrants who chooses to stay in the host country on permanent or long-term visa after graduation.

the stay rate of foreign students in the U.S.A., in particular from Taiwan, South Korea, China and India, brain circulation was defined as a phenomenon where “study and work abroad is followed by a return to the home country to take advantage of high-level opportunities” (Johnson & Regets, 1998). Since then, the concept of brain circulation evolved as the fourth wave of the literature on skilled migrants. However, the concept of brain circulation is still vague, and its own boundaries are often compromised within the related literature. The term is often used interchangeably with terms such as reverse brain drain, return migration, transnationalism, and diaspora. Therefore, first, I review several definitions of brain circulation, which have commonly been used in the literature to understand its common features. Second, I compare the definition of brain circulation with the related literature to understand its boundaries.

According to Johnson and Regets (1998), brain circulation involves initial migration and subsequent return migration to the home country after having studied or worked abroad. Saxenian (2005) defined brain circulation as the “returning of skilled people; permanently or temporarily, who have studied or worked abroad to pursue promising opportunities in the home country.” In contrast, Blitz (2005) emphasized the temporal nature of brain circulation in his definition. According to him, brain circulation is a process of “temporary migration of skilled people that enables intellectual resources to be shared across states rather than being permanently transferred” (Blitz, 2005). Some authors define brain circulation as a purely temporary process by eliminating the permanent returnees from the scope of brain circulation. For instance, Kuznetsov (2006) defined brain circulation as a temporary returning process of skilled migrants, where they are engaged in projects in the home country without physically relocating back to the home country.

Among all the four definitions, brain circulation mainly refers to the skilled migrants, professionals or, in the most lenient terms, people who possess tertiary educational qualifications or equivalent qualifications.

Then, “return” is a necessary condition among all the definitions. However, whether it is a temporal or a permanent flow remains a question (Blitz, 2005; Saxenian, 2005; Faodi, 2006). In a study of Chinese-Canadian academics, Blachford and Zhang (2014) argued that academics who return temporarily have made a significant contribution to human capital and capacity development in China. Similarly, Harvey (2012) pointed out that skilled migrants can contribute to the development of the home country without returning permanently to the country. However, it is worth noting that the contribution of permanent returnees to brain circulation is a well-established empirical phenomena. For instance, Taiwan returnees (Tsay, 2003) and South Korean returnees (Yoon, 1992) are mostly permanent returnees. Although many countries prefer a permanent returning flow of skilled migrants; the so-called “reverse brain drain,” they can equally rely on temporarily returning intellectuals, i.e. the diaspora, in the development process. If skilled migrants return with improved human, physical and social capitals, and contribute to the home country through accumulated business networks abroad and technical know-how, those returnees should be considered as part of brain circulation, irrespective of whether they returned permanently or temporarily. Therefore, as suggested by Saxenian (2005), it is rational to consider both temporary and permanent returnees are as integral parts of brain circulation.

Also, the definitions by Johnson and Regets (1998) and Saxenian (2005) narrowed the scope of brain circulation by referring to “returning to home country.” In contrast, Blitz’s (2005) explanation is much broader, as it refers to “resources sharing across states.” The modern flow of migration is characterized by multidirectional flows of skilled migrants, which benefit both home and host countries (Wickramasekara, 2003; Faodi, 2006). Therefore, the two-country focus of brain circulation as suggested by Johnson and Regets (1998) and Saxenian (2005), should be replaced with multidirectional focus. Nonetheless, it is reasonable to limit the focus of the discussion on brain circulation to home country and host countries for two main reasons. First, in empirical evaluations, it is not easy to track the movements of

skilled migrants over time and across many countries. Second, what matters in the migration of skilled people is how the skilled migrants contribute to the home country and the host country. Host country perspective can be extended to a single-country or multicountry scenario. Further, if a skilled migrant move to and invest in a third country, other than the home country and the host country, such investments are considered as Foreign Direct Investments (FDIs) from the perspective of the third country. Therefore, it has nothing to do with the brain circulation literature. Hence, while recognizing the new multi-directional nature of migration of skilled people, the discussion on brain circulation should be focused on the home country and host country perspectives.

The term brain circulation is becoming a popular word in the literature on skilled migrants. At the same time, it is emerging as another vague concept in development economics. Therefore, it is necessary to highlight its overlaps with other related concepts. In the viewpoint of the contribution of migration to the home country, three main broad concepts can be identified: return migration, circular migration, and diaspora.

Return migration, which is defined as “the movement of a person returning to his or her country of origin or habitual residence usually after spending at least one year in another country” (IOM, 2011, p. 86), covers a wide range of return migrants such as skilled returnees, low-skilled returnees, unskilled returnees, and ethnic returnees. However, it implicitly assumes a permanent flow of returnees to the original destination and does not refer to a temporal type of return migration. For instance, Gmelch (1980, p. 136) defined return migration as “the movement of migrants back to their homeland to resettle”; explicitly referring to the permanent nature of return migration. Similarly, Wickramasekara (2011, p. 9) defined return migration as permanent returning of migrants to the home country after the first trip. Similarly, brain circulation also accounts for the permanent type of returnees within its scope. Therefore, the permanent flow of skilled returnees, which is also known as reverse brain drain, is part of brain circulation and return migration. Nonetheless, return migration

does not account for the temporal type of returnees and brain circulation strictly refers to the skilled migrants. Hence, the scope of the two terms is not the same.

Diaspora is the other extreme of the spectrum, which is defined as “individuals and members or networks, associations and communities, who have left their country of origin, but maintain links with their homelands” (IOM, 2011, p. 28). Similar to return migration, the literature on diaspora accounts for different types of migrants, irrespective of their skill levels or ethnicity. Moreover, they may be permanent settlers, temporal settlers or people with dual citizenships (IOM, 2011). Although the definition of diaspora highlights the linkage between the migrants and the home country, it does not necessarily refer to the physical back-and-forth movements of the diaspora members between the two countries. In contrast to the brain circulation, returning is not a necessary condition to be qualified as a part of the diaspora. Therefore, skilled diaspora members who travel back-and-forth between the home country and the host country temporarily, either for business or employment purposes, can be recognized as part of brain circulation. These diaspora members have been identified as transnational employees and transnational entrepreneurs.

Circular migration is defined as “fluid movement of people between countries, including temporary or long-term movement which may be beneficial to all involved, if occurring voluntarily and linked to the labor needs of countries of origin and destination” (IOM, 2011, p. 19).¹⁵ The implication of circular migration is very much similar to that of brain circulation but is not limited to it. Circular migration predominantly refers to repeated migration of migrants between home and host countries, temporarily, and it may or may not include skilled migrants. Therefore, brain circulation is not synonymous with circular migration. The above explanations clearly indicate that brain circulation is not exclusive but overlaps with the concepts of return migration, diaspora and circular migration.

¹⁵ See Wickramasekara (2011) for some critics on this definition and a comprehensive review on circular migration and its implications.

. Based on the above discussion, this study uses a working definition of brain circulation **as a process of returning skilled migrants either temporally or permanently to pursue employment, entrepreneurial, or investment activities in the home country.** Further, I define a returnee as a skilled migrant if the returnee holds tertiary or equivalent educational achievements at the time of returning (Koser & Solt, 1997; Iredale et al., 2003; Saxenian, 2005) and have stayed abroad for more than one year (United Nations, 2011). The intended stay of the returnees in the home country may be permanent or temporal. In this study, I use the terms RSEs and REs to refer to each group, separately, and as returnees or RSM to refer to both groups, collectively. Section 2.5 reviews various factors that determine the returning decision of RSMs.

2.5 Determinants of Brain Circulation

In order to achieve the benefits of accumulated transnational capital, developing countries need to understand the factors that motivate brain circulation. Of course, the factors are multifaceted. Although there is ample research on the intention of migrants to return (Wadhwa, Saxenian, Freeman, & Salkever, 2009; Harvey, 2009), it is unclear as to whether the intention would reflect the actual behavior. Therefore, it is important to explore the observed behavior rather than the intention of migrants.

Black et al. (2004) developed a conceptual framework to analyze the determinants of individuals' returning decisions using three key aspects, namely, structural, individual and policy interventions. The initial framework was developed to understand the underlying determinants of voluntary returning of the asylums and refugees in the U.K., which is different from the context of brain circulation. Although the framework is applied to return migration studies (e.g. Yendaw, 2013), it cannot be directly applied to brain circulation research as the reference is not only for skilled migrants.

Thus, to explore the determinants and motivational factors of returning decisions of RSMs, I apply two lenses, which are not mutually exclusive but provide different insights into

determinants of returning decisions of RSMs. The push-pull framework is very popular in the literature on skilled migrants, and it is the main tool that has been employed to analyze the determinants of brain drain; the other side of the same coin. Next, I review the determinants and motivational factors of returning decisions at micro, meso and macro levels, with special emphasis on meso-level factors for two reasons. First, in many countries, migration of skilled people is specific to certain professions such as doctors, university lecturers, and engineers. Second, brain circulation will not take place if returnees are not involved in any productive activity upon their arrival. However, such issues will not arise in industry level studies as the respondents are involved in some productive activities as employees, employers, or consultants in industry organizations. Therefore, it is rational to investigate industry-specific factors more than micro or macro-level factors.

In addition, brain circulation in South Korea and Taiwan is recognized as a policy drive process. Active intervention of the respective governments has attracted the skilled migrants back to these countries. Therefore, tools employed by various governments to encourage brain circulation will also be reviewed.

2.5.1 Pull verses push factors

The migration decision of skilled people is often influenced by several factors. In its original conceptualization, the push-pull framework was used to analyze the determinants of migration from rural to urban areas and brain drain.¹⁶ In the context of brain drain, push factors are negative aspects of the home country whereas pull factors are positive aspects of the host country (Dzvimbo, 2003; Castles & Millar, 2003). Many developing countries have failed to create employment opportunities for the educated people due to a stagnant industrial sector. Besides, lack of higher education opportunities, low-paying jobs and political and economic instability are the push factors in the context of brain drain (Chang, 1999). The pull

¹⁶ The push-pull framework has employed to empirically test the Harris-Todaro two-sector model and other aspects of internal migration. Refer Hare (1999) for a case study of rural-urban migration in China using the same framework.

factors that drive the migration of skilled people arise from two sources. First, the skilled migrants may be self-motivated due to factors such as career prospects, lucrative life, and children's education in developed countries (Dzvimbo, 2003). Second, it may be a result of deliberate and aggressive policy implementations by the host country to attract the best brain. The H-1B visa scheme and green card visa scheme of the U.S.A. and the permanent residency visa scheme of Australia are notable examples of deliberate policies implemented by developed countries to encourage skilled immigrants.

However, in the context of brain circulation, the push-pull framework operates in the opposite direction. Push factors become negative aspects of the host country whereas pull factors are the positive aspects of the home country. However, it is not clear in the literature as to whether the pull factors outweigh the push factors in the process of brain circulation or vice versa.

The returning decision of the skilled migrants may be a result of the inability to extend the visa after the end of studies or working agreements in the host country. For instance, in a study of skilled returnees to Bangladesh, Rozairo and Gow (2003) found that most returnees had little choice to stay abroad after completing their studies, employment or business activities. Similarly, Anh (2003) reported that among RSMs to Vietnam, 29 percent of the respondents did not have a choice other than returning. While many developed countries try to attract the best brains from developing countries, they have implemented strict controls over visa extension to control excess foreign employees in those countries. Therefore, non-voluntary returning, which is a result of a policy decision of the host country government, should be considered as one of the push factors that influence the returning decision of the skilled migrants.

Skilled migrants might consider to voluntarily return if the host country conditions are not up to the expectations. The decision may be influenced by personal factors such as problems of assimilation into the host country (micro-level) or an economic downturn in the host

country (macro-factors). Otherwise, it may be due to lack of employment opportunities in a particular industry (meso-level). On the other hand, voluntary returning might have been motivated by pull factors in the home country. These pull factors may be social or personal factors (micro-level), growth or employment opportunities in a particular industry (meso-level) or rapid development in the home country (macro-level). Therefore, Subsection 2.5.2 reviews the micro, meso and macro level determinants of brain circulation.

2.5.2 Micro meso and macro level determinants

In the context of brain circulation, determinants can be classified into three levels, namely, micro, meso and macro (Iredala et al. 2003). Micro-level refers to the level concerning individuals, families, and communities, whereas meso-level is defined as the intermediary level concerning industry or regional level determinants. On the other hand, macro-level refers to the one concerning economies and societies at large.

2.5.2.1 Micro-level determinants

Micro determinants of brain circulation can be classified into three main motives, namely, preferences, wealth, and wages (Gibson & McKenzie, 2009). Preference is referred to the fact that staying in the home country is preferred to stay in a host country. Therefore, migrants compare their marginal benefits (additional income earned) and marginal cost (additional expenses incurred) in the host country. According to Yang (2006), if the lifetime marginal benefit is lower than that of marginal cost, migrants choose to return. According to NELM, the purpose of migration for some migrants is to generate a target level of wealth, which is necessary to overcome liquidity and investment constraints in the home country. Therefore, migrants will return once they generated the target level of wealth. Moreover, if the migrant cannot meet the minimum expectation of his migration, in particular, in terms of wages (Borjas & Bratsberg, 1996), such migrants also will be returned.

The classification presented by Gibson and McKenzie (2009) covered many aspects of micro-level determinants (31 factors) of return migration. However, further explanations on

how it would be related to brain circulation are needed. Moreover, providing too many options would make it difficult to filter the most important factors that motivated returning decision of the skilled migrants.

In the case of South-North migration, skilled migrants are better positioned to earn a significantly higher income in the host country than in the home country due to the per capita income differences in the two countries. However, South-South migration of skilled people may be driven by changes in the marginal benefits and the marginal cost of staying abroad as the salary differences in the host and home countries might not be so significant. Therefore, in the case of North-South brain circulation, “preference” should account for the social and cultural aspects, whereas in the South-South brain circulation, economic, social and cultural aspects should be included.

Assuming migration as a permanent move, the neoclassical theory of return migration explains the process of return migration as “negatively” selected or failed attempt of a migrant who cannot adjust or compete in the host country (Cassarino, 2008; Yahirun, 2009; Yendaw, 2013). The initial explanation of adjustment failure was a purely economic phenomenon, i.e. lower reward than the expected reward for a given level of human capital. Yet, these failures could also be raised from cultural shocks, language barriers, religious issues or social factors such as discrimination. Thus, in general, these failed attempts can be identified as assimilation issues of the skilled migrants. Assuming migration as a temporary move to achieve a targeted income level, NELM theory explains return migration as a successful achievement of a migrant through a self-selective process (Cassarino, 2008; Thomas-Hope, 1999).

According to Harvey (2009), culture, lifestyle and family consideration influence the returning decision of skilled migrants, however, to a lesser extent. Further, noneconomic factors also affect the returning decision of migration. These noneconomic factors may be patriotic feeling toward the home country, social and cultural ties with the home country (Gmelch, 1983) or greater choice, autonomy, job satisfaction (Blitz, 2005).

In addition, demographic factors such as age, gender and ethnicity are the individual attributes that could influence the returning decision, although not to a large extent (Waldorf, 1995). “Salmon run” or the returning of the middle-aged or the elderly after retiring from a job in a developed country is a well-studied phenomenon. For instance, most of the returning migrants to Estonia in the 1990s were retired Estonians from their jobs in developed countries (Kulu & Tammaru, 2000). The Salmon run can be a significant part of brain circulation as most of these middle-aged and retired skilled migrants could be endowed with technical know-how, business networks and institutional know-how. If involved actively as employees, entrepreneurs, or at minimum, as consultants to the firms in the home country, such retired skilled migrants can play a dominant role in transferring knowledge from developed to developing countries.

2.5.2.2 Meso-level determinants

Meso-level refers to the intermediary level such as industry or regional level (Iredala et al. 2003). Blitz (2005) argued that such industry and organizational level factors play a greater role than macro level factors in determining the adaptability of returnees to the home country conditions. Moreover, the returning decision of skilled migrants could be affected by growing employment opportunities, career progress, investment opportunities and growth of a particular industry. Thus, it is necessary to identify the industry-level determinants that influence the returning decision of skilled migrants given the industry-specific nature of brain circulation.

As highlighted by Gmelch (1980), unemployment in a single industry in the host country may be a primary cause of returning. Historically, technological changes have created skilled mismatches due to the mechanization of industrial processes. Therefore, industrial development may be an inherent structural issue that creates winners and losers. Even in recent years, similar incidences have occurred. For instance, the high unemployment created by the burst of the IT boom in the U.S.A., the so-called-NASDAQ crash in 2000, has

influenced the returning decision of the RSMs in the Zhongguancun Science Park in Beijing (Chen, 2008). Therefore, lack of employment opportunities in a particular industry could also be a meso-level factor that pushes back the skilled migrants to their home countries. However, others argue that the significant flow of Chinese returnees in 2000 was a result of sizeable FDIs in the semiconductor manufacturing sector in China (Saxenian, 2002).

In terms of the economic incentives that could convert brain drain into brain circulation, the wage rate is an influential determinant (Blitz, 2005; Mayr & Peri, 2008). As it was discussed under micro-level determinants, skilled migrants prefer to stay in the home country if it is economically viable (Gibson & McKenzie, 2009). In the case of South Korea, repatriated professionals received five to eight times higher salaries than their local counterparts (Yoon, 1992). The wage premium motivated many top scientists in the U.S.A. to return to South Korea. However, as Yoon (1992) highlights, such policy interventions could increase the supply of skilled returnees without an increase in demand.

Further, one of the principal reasons for skilled migrants' return is the availability of professional opportunities in the home country (Harvey, 2009). However, other than academic positions, such professional opportunities cannot be available if the industrial sector is not developed.

The above findings suggest that the professional opportunities and the wage rate are the main economic factors that motivate brain circulation at the industry level. If industries are booming, such industries can generate wage premiums and professional opportunities in a sustainable manner. In a market driven process, demand and supply determine the wage rate in an industry.

In a theoretical model, Stark et al. (1997) explained how industry growth affects returnees' decision. They argued that low-ability employees receive a lower-wage in the developed country. Therefore, low-ability skilled migrants will return once the low-ability is revealed. Although they are low-skilled workers in developed countries, they are likely to be

above average employees in the home countries. In other words, these low-skilled migrants have better opportunities at the early stage of industrial development in the home country (Stark et al., 1997). Therefore, returning decision is affected by the level of industrial development in the home country.

According to Wadhwa et al. (2009), majority of students in the U.S.A. from India and China wish to start a business in the home countries. Yet, most skilled migrants, who intended to start a business in the home countries, try to maintain their connections with the U.S.A. (Saxenian, 2005). Taiwan's success in the ICT industry is largely attributed to the presence of these kinds of transnational entrepreneurs (Saxenian, 2002). Therefore, it is clear that entrepreneurial opportunities in a particular industry could encourage such motivated, skilled migrants to start their own business in home countries.

It is widely accepted that rapidly growing industries in the home country are necessary to encourage the reverse flow of skilled migrants. However, it is evident that the business start-ups and subsequent rapid growth of Taiwan's ICT industry were significantly influenced by REs, who had the cultural identities of Taiwan and close links with the technological centers in developed countries such as Silicon Valley (Saxenian & Hsu, 2001; Saxenian, 2007). Thus, it is necessary to qualify this generally accepted assumption regarding the impact of industry growth on brain circulation because skilled employees and entrepreneurs respond differently to market signals.

The literature does not distinguish the different characteristics of REs and RSEs. A notable exemption is Iredala et al. (2003) that distinguishes the determinants of RSMs and REs in their study in four Asia-Pacific countries. Therefore, to validate the concept of brain circulation, industry-specific impacts are more important than the general trends of skilled migrants.

2.5.2.3 Macro-level determinants

The brain circulation phenomenon was first observed at the macro level (Blitz, 2005). Thus, early writers emphasized the importance of macro factors such as political stability, peace and economic growth in promoting brain circulation. Neoclassical theories, which focuses on utility maximization of individuals, have failed to conceptualize how macro factors shape the return migration process.

Some scholars argued that successful brain circulation in some countries cannot be replicable in other developing countries unless those countries have extensively invested in higher education (Johnson, 2002; Saxenian, 2007). The brain circulation can be promoted through the knowledge-intensive industries. Therefore, in economies where sufficient stock of human capital is not available, brain circulation cannot be promoted.

Moreover, a globalized economy with stronger economic growth, political stability, economic development and openness are necessary conditions to transform brain drain into brain circulation (Saxenian, 2007; Iredala et al., 2003).

2.5.3 Policy-driven brain circulation

Promotion of brain circulation is challenging. Most of the success stories, particularly in Asia, are outcomes of rigorous policy interventions to promote the return of skilled migrants. However, the same policy mix has failed in other parts of the world, for instance in Jamaica,¹⁷ making it skeptical to attribute the success of brain circulation to policy interventions *per se*. Moreover, some others argue that the success of brain circulation should be attributed to a rapidly growing economy but not the policies that focus on brain circulation. Therefore, it is necessary to explore the policy instruments employed by various governments to promote a beneficial brain circulation.

¹⁷The Jamaican policy mix to promote brain circulation comprised of travel expenses for returnee and their family members, which included a 50% shipping cost of the household items, full medical insurance for two years, and other fringe benefits such as salary subsidy for equipment and other literature items required for the returnee's work (Thomas-Hope, 1999).

2.5.3.1 Foreign education and forced returning

Developing countries should encourage foreign education, in particular, in advanced countries, if they want to expedite the catching up process. Therefore, a preliminary policy to promote brain circulation is to remove any obstacles for foreign education. According to Tsay (2003), Taiwan did not implement an open-door policy for student migration until the end of its Martial Law in 1987. However, its authorities understood the importance of foreign education to narrow the knowledge gap between the developed world and Taiwan. As a result, the authorities in Taiwan sent the best and brightest students of the country for overseas training, in particular in the U.S.A. Although the country did not open for free migration, the restrictions were lifted gradually from 1962 to 1989 (Tsay, 2003). Until 1962, migration was allowed only to the people who could pass the government examination. Then, in the period between 1962 and 1975, the restriction was even relaxed by allowing migration of any students who wanted to study abroad at their own expenses. Later, from 1976 to 1989, any students who produce enrollment certificates and visa to enter any country for higher education was allowed to migrate. Most of these foreign-trained skilled migrants did not return at the early stage but subsequently became the growth engine of Taiwan. In China, the estimated number of students who left for higher education by 2003 was over 300,000, of which, one-third have returned by the end of the 1990s. The number of returnees has dramatically increased by the late 1990s with the returnees who were seeking employment opportunities in face of the growing economy of China (Keren et al., 2003, 90). Therefore, facilitating free movement of knowledge between developed and developing countries help to build up a “brain reserve” as in Taiwan and China (O’Neil, 2003). Subsequently, the brain reserve can be utilized in the most needed time in the development process.

Governments in developing countries send professionals and public officers as trainees to developed countries to reap the benefits of accumulated knowledge in those countries. However, it was common in early years that those trained professionals rarely returned to

their home countries upon the completion of their higher studies or training. This was an early wave of the brain drain experienced by many developing countries. The natural reaction was to impose many binding conditions such as financial bonds and compulsory serving periods on professionals who wished to migrate. In China, migrants with government sponsorships have to sign an agreement to serve the country after their higher studies (Keren et al., 2003). Academics in state universities in Sri Lanka have to sign a finance bond prior to leaving the country for doctoral studies to serve the country for seven years upon the completion of their overseas Ph.D. degrees.

Such forced returning was a common strategy that was implemented by developing countries to overcome the problem of brain drain. However, as the False-Paradigm Model¹⁸ highlights, these restrictions controlled the external brain drain while they enhanced the “internal brain drain.” The term internal brain drain has different meanings. Todaro and Smith (2009) used the term to explain the deviation of academic motives of RSMs from important local problems toward sophisticated theoretical models that are unique to developed countries. The end result was severe. Those RSMs, who did not physically migrate to the North, intellectually migrated in terms of the orientation of their professional works (Todaro & Smith, 2009). Therefore, without imposing such binding conditions, it is advisable to facilitate the post-return career progress of skilled migrants, as in the case of reverse brain drain policies, which will be discussed in the next subsection.

2.5.3.2 Incentive-based reverse brain drain

International organizations and developing countries, which suffer from brain drain, have made various attempts to attract skilled migrants back to those home countries by providing various incentives to the returnees. The incentive packages remain similar in many aspects.

¹⁸ The False-Paradigm Model attributes the underdevelopment in developing countries to the biased and inappropriate advices and policies proposed by expert form developed countries and multinational organizations (Todaro & Smith, 2009).

The main instruments are material and non-material incentives that were channeled through a coordinating institution such as a government agency or a university (Agunias, 2006).

a) Material benefits and non-material benefits

Taiwan is the first country to succeed in promoting reverse brain drain through various incentive programs. Taiwanese government provided several incentives such as returning air tickets; mostly to the returnees and in some cases to the family of the returnees, salary or an allowance for a short period, housing facilities or low interest-rate housing loans, and schooling for the returnees' children. In particular, special privileges such as competitive salaries and good working conditions have been provided for the returning academics and scientists with doctorates and overseas working experiences (Tsay, 2003).¹⁹

As Keren et al., (2003) explained, the material and non-material benefits provided by the Chinese government, which include housing allocations, academic positions in universities, setting up higher salary levels or paying monthly allowances and school for the returnees' children, were almost similar to the Taiwanese package.

The South Korean case is somewhat special compared to the other stories of state-led reverse brain drain. The returnees were awarded the same mix of benefits such as full coverage of door-to-door moving expenses, free housing, overseas travel and many other benefits (Yoon, 1992). In addition, they had been rewarded with higher salaries, which are five to eight times higher than those of the local counterparts, enjoyed a superior autonomy and independence in their research and development activities (Yoon, 1992).

In a similar way, the return of the talent program of Jamaica with the collaboration of IOM provided the same mix of material benefits to promote brain circulation. The policy mix comprised of travel expenses for returnees and their family members, which included a 50% shipping cost of the household items, full medical insurance for two years, and other fringe

¹⁹ Refer Tsay (2003) for a list of Taiwanese institutions that involved in the process and facilities provided under each institution.

benefits such as salary subsidy for equipment and other items required for the returnee's work (Thomas-Hope, 1999).

In recent years, Malaysia also applied a similar set of incentives to attract skilled Malaysian migrants back to the home country. Contrary to the success stories of reverse brain drain in Taiwan, China and South Korea, Jamaica could not achieve the expected outcome despite using similar policy instruments.

b) Business promotions through transnational entrepreneurs

The next instrument was promoting diaspora investment and transnational entrepreneurship. Many countries have set up special zones with some pre-specified facilities to attract talent abroad. In China, both central and regional governments have established science parks, special development zones and high-tech zones in many highly urbanized cities such as Beijing and Shanghai (Keren et al., 2003; Saxenian, 2002). The Beijing government promoted Zhongguancun Science Park as a knowledge cluster to attract the overseas Chinese to set up their own businesses, either jointly or individually. According to Chen (2008), this is one of the 23 zones developed by the Beijing government to attract overseas Chinese investors and entrepreneurs. The benefits provided by city governments included a simplified procedure to start a business, tax exceptions for the firms in technology businesses, special loans for research & development at concessionary rates, and import concessions on equipment and materials (Keren et al., 2003). These policies have attracted a large number of skilled migrants back to China. For instance, there were around 6,000 returnees in Zhongguancun Science Park by 2008 (Chen, 2008).

c) Other supportive policies

The Chinese government issued a special circular²⁰ removing the existing entry-exit barriers for the student abroad and their family members as a goodwill gesture to encourage

²⁰ Circular of the general office of the state council concerning matters relating to students studying abroad <http://www.asianlii.org/cn/legis/cen/laws/cotgootsccmrtssa950/> (retrieved on 4th August 2014)

the return flow of overseas talents. A rigorous policy was introduced to promote returning and free movement in 1993. In the early 2000s, the Chinese government started to reach Chinese talents in the host countries and encourage them to return. These include recruitment fairs that were organized in main cities in the U.S.A., Europe and Australia (Keren et al., 2003). Overseas missions have been effectively utilized to distribute information on these incentive programs to skilled migrants in those countries. Further, the Chinese government promoted business exchanges between overseas students and their local counterparts devoting a substantial amount of resources (Saxenian, 2002). In the absence of such initiatives by the Indian government, the alumni association of the Indian Institute of Technology has mediated to link Silicon Valley with India.

d) Issues of incentive based reverse brain drain

The incentive-based reverse brain drain has produced mix results in different parts of the world. There are several issues that explain the failure of providing material and non-material benefits to the returnees. First, the content of the incentive program had not been well-informed to the returnees. According to Keren et al. (2003), about a half of the respondents out of 185 were not aware of the government incentive programs for returning skilled migrants. Second, rigorous policies to attract overseas talent through various incentive programs might discriminate against the local talent and thereby create a tension between the two groups (Yoon, 1992; Keren et al., 2003). While most of the educated migrate, some patriotic and highly skilled people have remained home in developing countries. Incentives to encourage the returning skilled migrants might discriminate against the skilled people who did not migrate and contributed to the economic growth and development of the home country. Third, if economic growth is not fast enough to accommodate the returning skilled migrants, who have been motivated by these incentives and policies, the process will lead to an oversupply of skilled people generating an extra fiscal burden on the developing country.

2.6 Effects of Brain Circulation

Brain circulation is critically important in the globalized and knowledge-based economy as RSMs transfer technical knowledge, business contacts, information on new markets and emerging opportunities to developing countries (Saxenian, 2002, 2007). For instance, brain circulation in Taiwan has contributed to the upgrading of local capabilities and to moving up through the global value chain of the ICT industry (Saxenian & Hsu, 2001; Saxenian, 2002). However, how to analyze the effects of brain circulation is not yet methodologically established. Therefore, in this section, I explore the level of analysis in the related literature. Based on the review, I propose the industry-level as the most appropriate level to analyze the effects of brain circulation.

2.6.1 Effects of brain circulation at micro, meso and macro levels

Similar to Subsection 2.5.2, effects of brain circulation can be analyzed at the micro, meso and macro levels. Increased income at individual or family level, skill development, acquisition of capital, and improved socio-economic status at individual, family, and community levels are considered as micro-level effects. However, the potential benefits of brain circulation at meso-level are not well-explained in the literature (Iredala et al. 2003). Some exceptions include Kale et al. (2008) and Obukhova et al. (2012). The macro-level effects of brain circulation may be in the form of remittances, effects on the balance of payment, human capital accumulation at the national level, and contribution of migration network on international trade.

Brain circulation does not relate to nonproductive means of returning. As Harvey (2012) highlighted, brain circulation only happens if the returnees are engaged in employment, entrepreneurial or investment activities in the home country. Further, he argues that returning of skilled migrants for leisure and recreation activities should not be considered as part of brain circulation. On similar grounds, if skilled migrants returned after their retirement, they also should not be considered within the scope of brain circulation, unless they are involved in

some kind of productive activities in the home country. The problem of nonproductive returnees would not arise in the industry-specific studies as the discussion is limited to the actors in an industry such as investors, employees, professionals, policy makers and entrepreneurs. Thus, industry-level effects of brain circulation are reviewed in the next subsection.

2.6.2 Effect of brain circulation at industry-level

Industry-level effects of brain circulation occur when RSEs and REs share their knowledge, skills and networks with the local firms. Saxenian (2007) argued that transnational communities with work experience and link to the diaspora and knowledge centers are the key actors in industrial development of developing countries. The subsections below will review REs' advantage in exporting, access to foreign capital, and institutional know-how. The effects of RSEs are not covered in this dissertation.

2.6.2.1 Impact on export performance

The recent literature attest to the positive impact of export in an industry on macroeconomic factors such as the accumulation of foreign currency reserves, reducing unemployment and enhancing domestic resource utilization through forward and backward linkages (Ahmed, Julian & Mahajar, 2008). On the other hand, the success of national industries also depends on exportability (Czinkota, 1994). Business firms exploit the domestic market at the early stage of the industry growth. However, except in a few developing countries that are endowed with a large domestic market such as India and China, the success of an industry is largely dependent on the export performance. Nonetheless, exporting in general, and exporting of knowledge services in particular, is challenging and most of the industries in developing countries failed to prosper in the export market. Among many reasons, lack of foreign business know-how and market connections are prominent factors (Ahmed et al., 2008).

Capable entrepreneurs who can connect with foreign partners' quickly and deal with dynamic and complex business relationships and network across national borders is scarce in today's globalized and connected world (Saxenian, 2007). This is particularly valid in an era of increasing outsourcing from the North to the South (Blinder, 2006). Therefore, REs, who have been exposed to the market domain and the technology domain in advanced countries, have a competitive advantage to reap the benefits in a knowledge-based economy. Nonetheless, some scholars argue that REs underperform compared to their domestic counterparts due to institutional factors, lack of local networks and mismatches between the new venture and the institutional environment in the home country (Chen, 2008; Obukhova et al., 2012). Moreover, some authors argue that the knowledge mismatch no longer exists in a globalized economy but emphasize the significance of local social capital to thrive in the domestic market (Vanhonacke, et al., 2005). The factors described above do influence on the success of a venture if the market orientation is domestic. Entrepreneurs need to have sound local networks and need to be aware of the institutional environment to succeed in the local market (Saxenian, 2002). Moreover, if the domestic market is not matured enough, the innovative ideas brought back by the REs might not be successful in the local market. However, none of these barriers would arise if the target market is advanced countries. In such a situation, human, physical and social capital or "transnational capital" accrued by REs during their overseas stay play a significant role (Saxenian & Hsu, 2001; Saxenian, 2002, 2007; Vanhonacker et al., 2005). Transnational capital is defined as "value added to human capital by time spent overseas, including foreign knowledge, technology, networks and resources" (Vanhonacker et al., 2005, p. 3). The concept is more applicable to the knowledge economy as it differentiates the knowledge accrued in the home country and the host country. According to Nanda and Khanna (2010), another channel to overcome exports barriers is to engage with the diaspora. However, their findings suggest that entrepreneurs who have stayed

abroad have greater access to the diaspora for business leads compared to entrepreneurs who do not have such exposure.

2.6.2.2 Financial market imperfections

Besides the problems associated with exporting product and services, capital market imperfection also weakens the efforts to promote entrepreneurship in developing countries. Even though some motivated entrepreneurs manage to start businesses in developing countries, most of them struggle to expand their businesses after formation (Schiffer & Weder, 2001; Bigsten et al., 2003; Beck & Demirguc-Kunt, 2006; Nichter & Goldmark, 2009). The stagnation of business may be an outcome of many obstacles that are unique to developing countries. Among them, financial bottlenecks such as lack of collateral, insufficient information on credit tools and lack of innovative financial instruments are prominent. Moreover, small and medium sized enterprises also struggle to overcome capital market imperfections at the early stage of firm growth (Schiffer & Weder, 2001). The problem is much worse within the KSI due to asymmetric information and lack of tangible collaterals to secure external funds (Carpenter & Petersen, 2002). In developed countries, innovative financial instruments solve the problem of market imperfection such as venture capital financing and business angels in the context of the KSI.

Although such innovative financial instruments are not available in developing countries, REs who are exposed to such institutions can easily access to venture capital financing and business angels in advanced countries. In addition, these REs participate in establishing such institutions, i.e. venture capital financing, in developing countries (Saxenian & Sabel, 2008). For instance, the success of the Israeli IT industry is largely attributed to the presence of the second largest venture capital networks in the world. Importantly, the institutional innovation "venture capital financing" has been accompanied by the returned venture capitalists from the U.S.A. (Saxenian, 2007). Thus, due to their exposure to such new ways of business financing, REs are not bound by capital market imperfections in developing countries.

Further, foreign investors, either the venture capitalist or business angels look at the profitability of the firms and have a higher confidence in entrepreneurs who have proven track records in the international business. Moreover, REs have a higher probability to raise foreign funds through the diaspora due to the social networks they created during the overseas stay (Nanda & Khanna, 2010).

2.6.2.3 Knowledge diffusion

REs transfer institutional know-how from the technological hubs in developed economies to developing countries as a way to overcome institutional issues in developing countries (Saxenian, 2007). This may be in the form of venture capital finance, merit-based promotions, transparent corporate governance, teamwork culture and minimal hierarchy in the organizational structure (Saxenian, 2007).

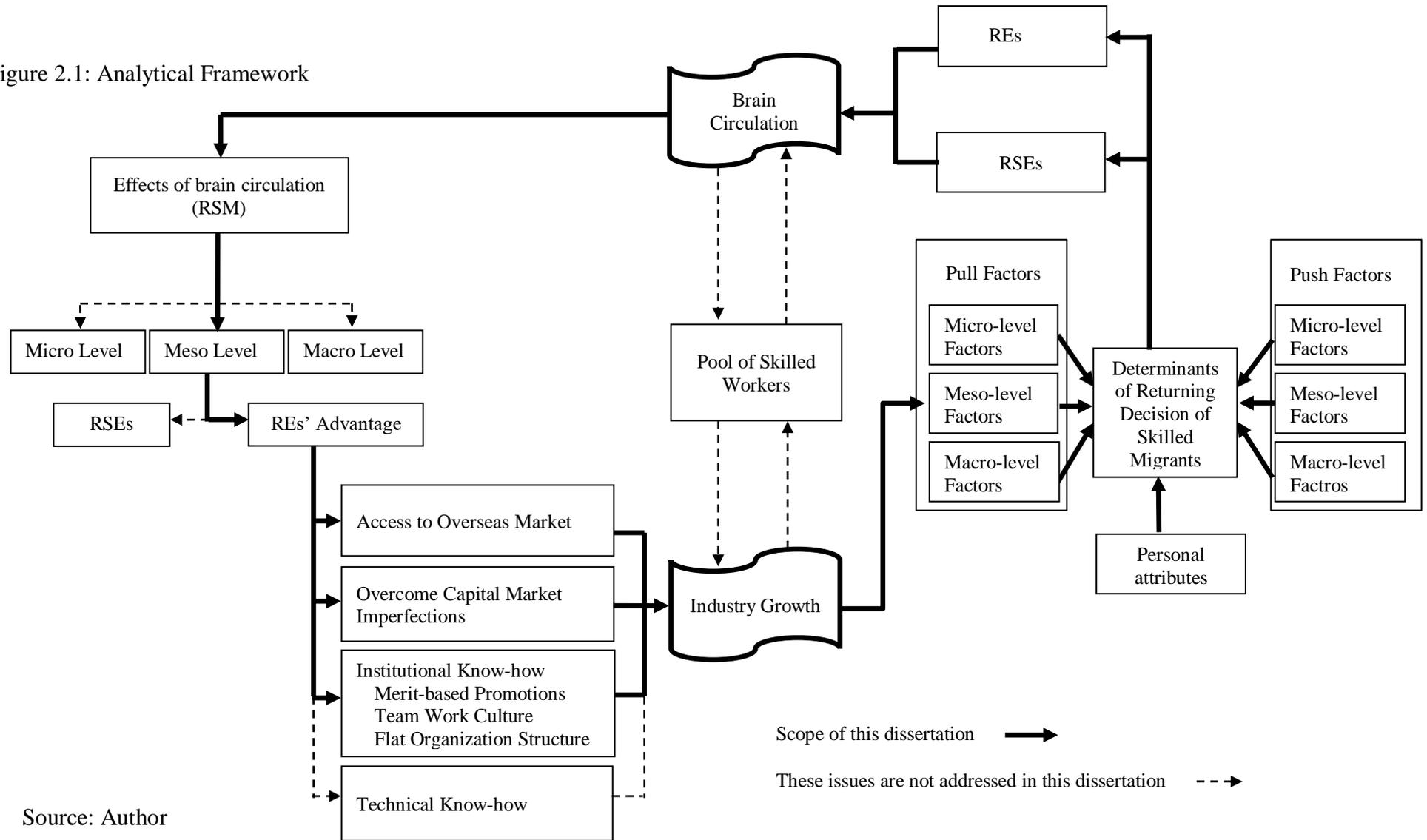
Skilled migrants are faster and more flexible than MNCs to transfer technical and institutional know-how between distant economies, thereby, playing a dominant role in the knowledge economy (Saxenian, 2007).

2.7 Analytical Framework

Bases on the literature review above, I consider two processes to explain how brain circulation and industry growth are related. The first process explains the factors that have promoted brain circulation within the KSI in Sri Lanka and the second process explains the effects of brain circulation on business expansions and industry growth. The framework that explains the scope of the analysis is presented in Figure 2.1.

The arrow from industry growth to brain circulation on the right side explains the first process. Factors that determine the returning decision of skilled migrants are multifaceted. These determinants can be broadly classified as pull and push factors. Pull factors are the favorable conditions in the home country whereas push factors are the unfavorable conditions in the host country. Alternatively, these determinants can be classified as micro-level factors, meso-level factors and macro-level factors.

Figure 2.1: Analytical Framework



Source: Author

Industry growth is considered as a pull factor and a meso-level factor in this study. Moreover, the returning decision may also be influenced by the personal attributes such as age, gender, and ethnicity, of skilled migrants. The determinants of returning decisions are not common for REs and RSEs. Therefore, factors that influence the returning decision of REs and RSEs are separately analyzed.

The arrow from brain circulation to industry growth on the left side of the figure explains the second process. Effects of brain circulation can be evaluated at macro, meso or individual micro levels. The meso-level is intermediate effects of brain circulation on a particular region or an industry. The focus of this research is on industry-level, which is an unexplored area in the brain circulation literature. Moreover, effects of brain circulation can be analyzed through REs and RSMs. I focus on how REs help to achieve the industry growth in various ways, namely, (i) access overseas markets; (ii) overcome capital market imperfections; and (iii) transfer institutional know how.

2.8 Chapter Summary

This chapter discussed the evolution of the concept of brain circulation as a key term in the literature on migration of skilled people, its determinants and effects at the industry level. Based on the discussion in the chapter, several unresolved issues were identified. First, the concept of brain circulation is still at its infancy stage, which does not have a clear consensus on the scope and the definition. Scholars are skeptical about the general validity of the concept of brain circulation due to lack of empirical evidence from countries other than Taiwan, China, South Korea, India and Israel. Further, scholars have employed various definitions to explain the concept of brain circulation. After reviewing the existing definitions, I defined brain circulation as a process of returning skilled migrants either temporally or permanently to pursue employment, or entrepreneurial or investment activities in the home country.

Second, the determinants of return migration from North to South are under-researched. Studies that investigate the returning decision of skilled migrants are limited. In general, the decision to return may be affected by push or pull factors. However, it is not clear whether pull or push factors triggered the recent returning flows of skilled migrants. In addition, some scholars identified micro-level and macro-level factors as key determinants of the returning decision of skilled migrants. Nonetheless, meso-level factors have received little attention.

Third, it is generally accepted that the returning of skilled migrants to some countries such as South Korea was driven by incentives provided by the government. However, the effectiveness of such incentives to promote the returning of skilled migrants is questionable as the policy mix has failed in some other countries. Therefore, it is not yet clear whether returning can be promoted through incentives or not.

Fourth, effects of brain circulation can be analyzed at micro, meso or macro levels. Increased income at individual or family level, skill development, acquisition of capital, and improved socio-economic status at individual, family, and community levels are considered as micro-level effects. The macro-level effects of brain circulation may be in the form of remittances, effects on the balance of payment, human capital accumulation at the national level, and contribution of migration network on international trade. However, meso-level factors are not identified. In particular, the ways in which REs can contribute to business expansion and industry growth are not well-studied. Moreover, there are no other accepted framework available in the literature to analyze the effects of brain circulation.

Fifth, REs, who have been exposed to the market domain and the technology domain in the advanced countries, should have a competitive advantage to reap the benefits in the knowledge-based economy. Transnational capital should help REs to outperform local counterparts. Some scholars argue that REs underperform compared to their domestic counterparts. However, these studies are concentrated on Chinese case studies, which cannot

be generalized due to the political structure of the country and the large population.

Therefore, more analyses comparing REs and local entrepreneurs are needed.

Finally, many scholars recognize the positive effects of brain circulation on the home country and the host country, yet, the focus has been on country-specific effects. A particular industry can gain from brain circulation while the country is suffering from brain drain as a whole, or brain circulation can emerge as an industry-specific process. Therefore, Chapter Three will consider why the KSI in Sri Lanka is suitable to elaborate the industry-specific nature of brain circulation.

CHAPTER 3: Migration of Skilled People and the KSI in Sri Lanka

3.1 Introduction

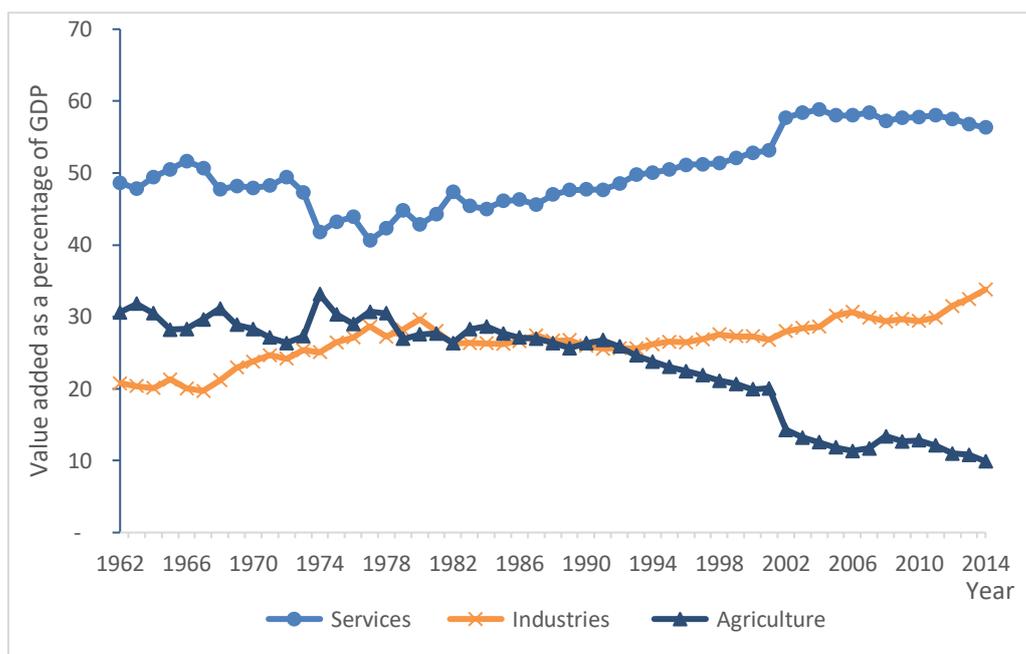
This chapter introduces the KSI in Sri Lanka as a unique case to examine the industry-specific nature of brain circulation. Sri Lanka is a middle-income country located in the South Asian region. The country has achieved a comparatively high level of social development being an “outlier” among the developing countries. It leads the South Asian region in the Human Development Index (HDI) and it was classified in the High Human Development category in 2017 (UNDP, 2018). Moreover, 91 percent of adult literacy rate, 75.5 years of life expectancy and over 13.9 years of average years of schooling are some of the remarkable achievements of the country. Sri Lanka has failed to achieve a rapid economic growth despite high level of social development. Some industries such as tourism and KSI are flourishing in the stagnated economy despite significant brain drain occurring from the country.

The rest of this chapter provides an overview of migration trends of skilled people in Sri Lanka and rapid growth of KSI, and its relative importance to the Sri Lankan economy. Section 3.2 focuses on the industrial structure of Sri Lanka that describes the exchange earning capacities and its trends. In Sri Lanka, agriculture and low-value-added textile and garment (T&G) dominate exports. As discussed in Chapter Two, investment in human capital is not sufficient to achieve a rapid growth if country is experiencing a severe brain drain. Sri Lanka has not utilized its human capital domestically. Instead, it has exported it to the developed and other developing countries. Section 3.3 discusses the nature of migration of skilled people in Sri Lanka in a historical perspective and presents the trends of skilled migrants. the KSI in Sri Lanka has achieved rapid growth in recent years. Section 3.4 discusses how the KSI in Sri Lanka started, its recent growth momentums and its contribution to the brain circulation. Section 3.5 presents the chapter summary.

3.2 Industrial Structure in Sri Lanka

Sri Lanka is a service sector driven country with a moderate industrial sector and the shrinking agricultural sector. Figure 3.1 shows the contribution from service, industry, and agriculture sectors to Gross Domestic Product (GDP) from 1962 to 2014.

Figure 3.1: Structural Composition of the Sri Lankan Economy, 1962-2014



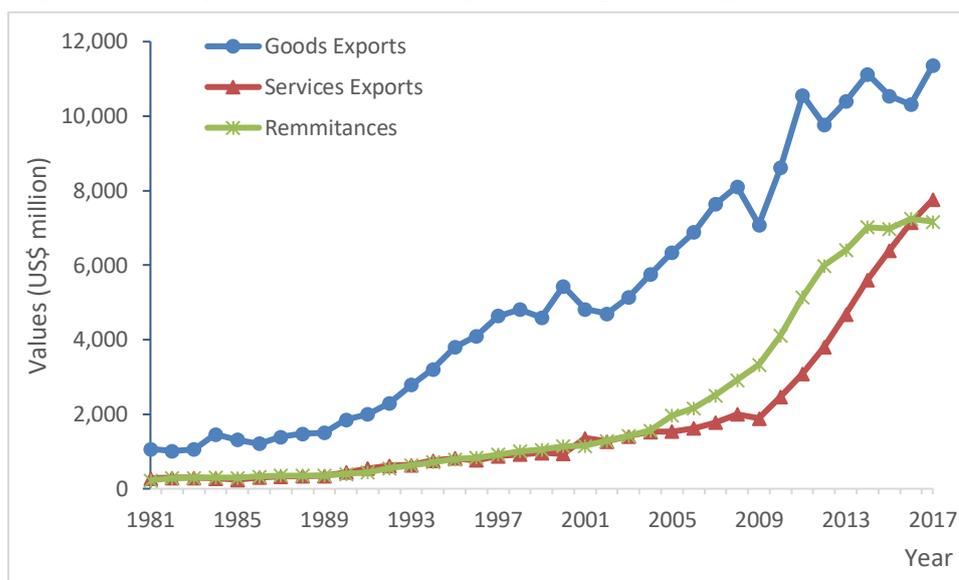
Source: CBSL (2015).

As shown in Figure 3.1, the service sector accounts for nearly 56 percent of GDP in recent years. Nonetheless, employment in the service sector was 45 percent in 2014 (CBSL, 2015). Although the industrial sector has accounted for a significant share of the employment in the country, about 26.5 percent in the year 2014 (CBSL, 2015), its share in GDP remains around 34 percent. Contribution of the agricultural sector has continuously shrunk from over 30 percent in the 1960s to 10 percent by 2014. Nonetheless, the agricultural sector accounts for nearly 28.5 percent of the total employment in 2014 (CBSL, 2015). Accordingly, the service sector is the most productive sector in Sri Lanka compared to the other two sectors.²¹

²¹ Productivity, as measured by output divided by employment in the sector, is significantly higher in the service sector than other sectors.

Figure 3.2 shows the major exchange earning sources of the country from 1981 to 2017. Merchandise export is the leading category followed by services exports earnings and remittances. In 2017, Merchandise exports earnings were US\$ 11,360 million, whereas services exports and remittances were US\$ 7,760 million and US\$ 7,164 million, respectively.

Figure 3.2: Major Sources of Foreign Exchange Earnings in Sri Lanka, 1981-2017



Source: CBSL (2018).

As Figure 3.2 indicates, merchandise export earnings have been frequently affected by external shocks. For instance, due to the global economic slowdown in 2009, merchandise export earnings declined by 13 percent compared to the value in the year 2008. It is interesting to note that merchandise exports have heavily depended on the unskilled or low-skilled labor of the country. More than 40 percent of the merchandise exports come from T&G exports, whereas another 30 percent is accounted for by traditional agricultural exports such as tea, rubber, and spices. None of these industries/sectors cater to the skilled workforce of the country.

Nonetheless, as Figure 3.2 suggests, the service sector in Sri Lanka is gaining a momentum in the export sector in recent years. Services export has steadily increased its share in the total export, in particular, in the last eight years, and has been less vulnerable to

external shocks. The tourism industry and the KSI have played a dominant role in achieving the momentum of services exports in recent years. From 2001 to 2012, the contribution of knowledge services exports to the services exports has more than doubled, accounting for 15 percent of services exports in 2013. Unlike merchandise export, most subsectors within the service sector employs the skilled workforce. Therefore, service sector expansions in the total exports have directly contributed to the reduction of unemployment among skilled people in the country.

Besides, remittance increased dramatically, from about US\$ 1 billion in 2004 to over US\$ 7 billion by 2014 and stagnated, thereafter. The large amount of remittances also indicates the labor exporting nature of the Sri Lankan economy. However, of the US\$ 7 billion remittance, nearly US\$ 3.9 billion was received from Middle East countries (CBSL, 2018).

3.3 Migration of Skilled People in Sri Lanka

This section provides an overview of the migration of skilled people in Sri Lanka. Subsection 3.3.1 presents the history of migration since 1948, which is the post-independent era of the country. Sri Lankan diaspora and its geographical distribution are useful to understand the South-North nature of migration of skilled people. Therefore, Subsection 3.3.2 presents a brief overview of the Sri Lankan diaspora followed by the migration trends of skilled people in Subsection 3.3.3.

3.3.1 History of migration in the post-independent era

Historically, migration in post-independent Sri Lanka can be classified into five significant flows. The first wave took place in 1956 due to the adoption of Sinhalese as the official language, which is within eight years after Sri Lanka's independence from the British (Thenuwara, 2013). The victims were European descendants and educated ethnic minorities of Tamils. The European descendants or "Burghers" is an ethnic group in Sri Lanka that represents children born to European fathers. At the time of independence, Burgher people held high positions in the Sri Lankan civil service, forces and other administrative services.

The Sinhalese only policy abolished the use of English as the official language by victimizing the Burgher people. Therefore, many Burghers migrated to Australia, Canada and the U.K. in the late 1950s (Henry, 1986).

The second wave of migration took place in the 1970s due to two main triggering events (Gunatilleke & Sunderalingam, 1978). First, in 1971, Sri Lanka experienced its first armed insurrection attempt that was organized by a group of Marxist followers. Second, the government, which was formed in 1970, and was in power until 1977, implemented a fully controlled and closed economic policy. These two events were responsible for the second wave of the migration in which most of the migrants were skilled migrants. For instance, 36 percent of accountants in the country migrated during the period 1971-1974 (Gunatilleke & Sunderalingam, 1978). A similar pattern was observed among doctors (20.4%) and engineers (18.6%) during the same period.

Ethnic clashes and the eruption of civil war in the early 1980s triggered the third wave of migration. These migrants were predominantly ethnic Tamils and educated Sinhalese, who left the country because of the weakening security conditions. During the three decades-long civil war, a large share of the ethnic Tamils, educated people in particular, migrated to North America and European countries to escape the war, whereas some others ended up migrating to neighboring India. This trend continued until the end of civil war in 2009.

The fourth wave of migration happened in the late 1980s, again, due to the second uprising of the Marxist followers. The second armed revolution was mainly backed by university students of the country (Thenuwara, 2013). The consequence was the closure of all the state universities for three years consecutively, which were the only institutions that were authorized by the government to offer undergraduate degree programs in Sri Lanka during that period. As a result, Sri Lanka could not produce a single graduate within these three years, leading to a backlog of undergraduates in the system creating further problems in the subsequent years. However, those who could afford foreign education migrated for higher

education in developed countries such as Australia, the U.K. and the U.S.A., creating a new trend in tertiary education in Sri Lanka. Thus, the fourth wave of migration from Sri Lanka occurred for two reasons. First, many educated people fled the country due to the weakening security condition. Second, the closure of public universities promoted student migration from Sri Lanka to other countries.

The fifth wave started with the introduction of liberalized economic policies in 1978. Thousands of unskilled workers, women in particular, migrate to the Middle East countries as domestic workers. Moreover, a significant number of skilled people and professionals²² migrate to Dubai, U.A.E. and Doha, Qatar. Also, every year, many skilled people leave the country seeking a lucrative life in Europe and, in recent years, in Australia. The fifth wave of migration is different from the four waves mentioned earlier for two reasons. First, in the fifth wave, migration was driven by economic reasons, whereas in the other waves, migration was driven by non-economic reasons. Second, the fifth wave indicates a South-South pattern in migration. In contrast, other waves indicate a South-North pattern. The geographical distribution of the Sri Lankan diaspora is presented in the next subsection.

3.3.2 Sri Lankan diaspora

Migration from Sri Lanka is a multidimensional phenomenon as mentioned in the previous section. According to the CBSL (2013), nearly two million Sri Lankans were living outside the country in various parts of the globe. Table 3.1 presents the geographical distribution of Sri Lankan migrants in the world in 2010. Only the countries with over one thousand Sri Lankans are reported.

²² The Department of Census and Statistics (DCS) of Sri Lanka defined professionals as people who “increase existing knowledge, apply scientific or artistic concepts and theories, or teach in a systematic manner. Professionals include engineers, lawyers, economists, computing professionals, teachers and health professional that require skills at graduate and postgraduate education” (DCS, 2017, p. 9).

Table 3.1: Geographical Distribution of Sri Lankan Migrants in the World in 2010

Region/ Country	Stock of Sri Lankan Migrants	Country/Region	Stock of Sri Lankan Migrants
<u>Middle East</u>		<u>North America</u>	
Saudi Arabia	391173	Canada	123012
Kuwait	208893	U.S.A.	34572
U.A.E.	161061		
Jordan	102709	<u>South Asia</u>	
Qatar	87727	India	161472
Oman	40711		
		<u>Oceania</u>	
<u>Europe</u>		Australia	78098
U.K.	113448	New Zealand	7938
Italy	79400		
Germany	47813	<u>East/South East Asia</u>	
France	43712	Thailand	27015
Switzerland	25186	Japan	8791
Norway	11561	South Korea	8072
Sweden	7388	Malaysia	4453
Greece	1267	Singapore	3016

Note: Only the countries that have more than 1,000 Sri Lankan immigrants are reported.
Source: IOM (2014).

According to Table 3.1, about 50 percent of the total migrants, mainly unskilled domestic workers, were living in the Middle East countries in 2010. Saudi Arabia had around 390,000 Sri Lankans, and there were over 500,000 migrants in other Middle East countries. Sri Lankans in India were predominantly ethnic Tamils, who emigrated as refugees or asylum seekers during 30 years of civil war. Due to the close proximity, even poor war victims were able to emigrate to India spending a relatively small amount of money. Canada also hosts a large share of ethnic Tamils who emigrated from Sri Lanka.

Unlike the Sri Lankan migrants in the Middle East and India, a majority of the migrants in other parts of the world are skilled migrants. In particular, only the skilled migrants have succeeded in entering OECD countries such as the U.K., the U.S.A., Canada, Australia, Japan and New Zealand due to entry barriers. On the other hand, ethnic Tamils who fled Sri Lanka during the 30 years of civil war represent a large share of the Sri Lankan diaspora.

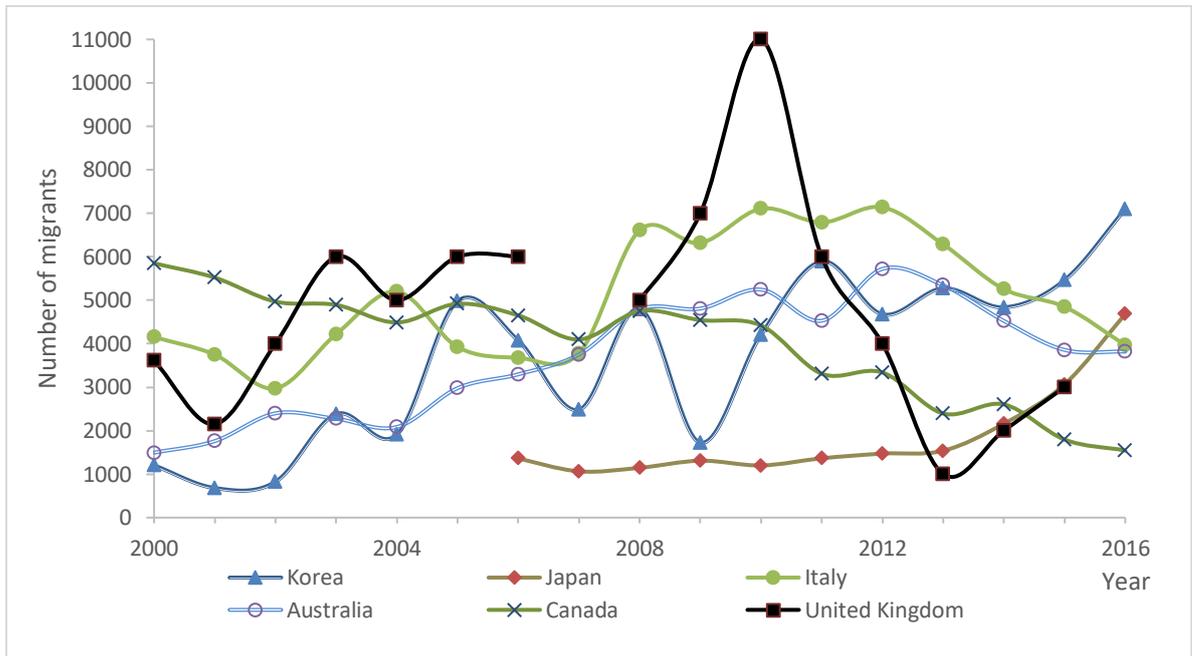
The U.K., as one of the former colonial rulers of the country, hosts the largest Sri Lankan diaspora in Europe, accounting for 113,448 in 2010. Until now, Sri Lanka has followed the British system in many fields such as Commercial Law, Civil Administration and Education. For instance, the education system of the country has a similar structure Sri Lanka uses, Ordinary Level Examination and Advanced Level Examination as in the U.K. system. Further, Sri Lankan students are allowed to sit for the London Ordinary Level and Advanced Level examinations instead of Sri Lankan exams. The medical degrees offered in Sri Lanka has a good recognition in the U.K. as well. Moreover, Sri Lanka has the largest student population for the Chartered Management Accountants course outside the U.K. (A.T. Kearney Inc., 2012).

The recent migration trends of skilled people from Sri Lanka are presented in the subsection below.

3.3.3 Migration trends of skilled people

In order to understand the migration trends of skilled people in Sri Lanka, it is worth analyzing the migration flows to OECD countries. Figure 3.3 presents the annual out migration to selected OECD countries from Sri Lanka. In OECD data, migrants are considered as the long-term migrants if they migrate for higher studies, employment and on permanent residence visa from another country.

Figure 3.3: Migration of Sri Lankans to Selected OECD Countries by Country of Destination, 2000-2016

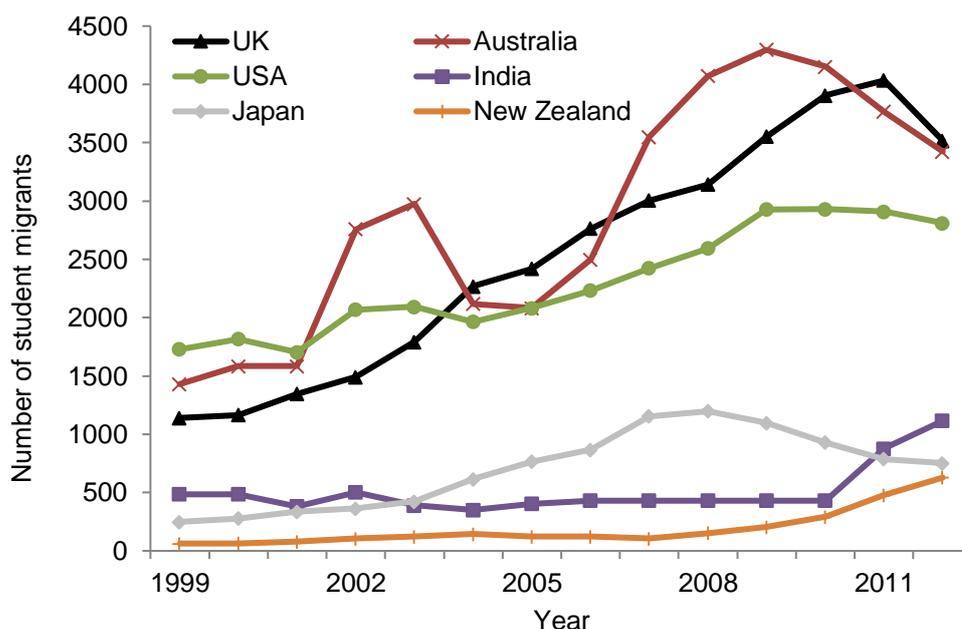


Source: OECD (2018).

South Korea has received the highest number of migrants in 2016 followed by Japan, Italy, Australia and France, respectively. Migration to South Korea has significantly increased in recent years as a result of the employment permit system of the South Korean government. The skilled migrants to Japan have increased steadily since 2013. The number has increased from 1,538 migrants in 2013 to 4,682 migrants in 2016. The U.S.A. was the seventh most popular country for Sri Lankan migrants in 2012. In particular, it is a preferred destination among science and engineering graduates in Sri Lanka. Canada was the most preferred destination for Sri Lankan migrants in 2000. However, the inflow of Sri Lankan migrants to Canada has continued to decline during the last decade. And the number has declined from 5,849 in 2000 to 1,545 in 2016. Migration to Australia has increased by an annual average of 26 percent from 2000 to 2012. While it controls illegal, mostly unskilled migrants, Australia has been promoting skilled immigrants by making it easy to obtain their permanent residency and working visa. However, since 2012, the number has declined significantly. According to the Australian government, seven out of ten immigrants from Sri Lanka are coming under the

skilled schemes.²³ Most of these OECD countries have imposed strict control over immigrants, however, with some exceptions for students, highly skilled people and professional immigrants. Therefore, a continuous flow of migration to these countries reflect that there is a persistent migration of skilled people from Sri Lanka to OECD countries.

Figure 3.4: Main Destinations of Sri Lankan Students Studying Abroad for Tertiary Education, 1999-2012



Source: United Nations Educational, Scientific and Cultural Organization (UNESCO) (2013).

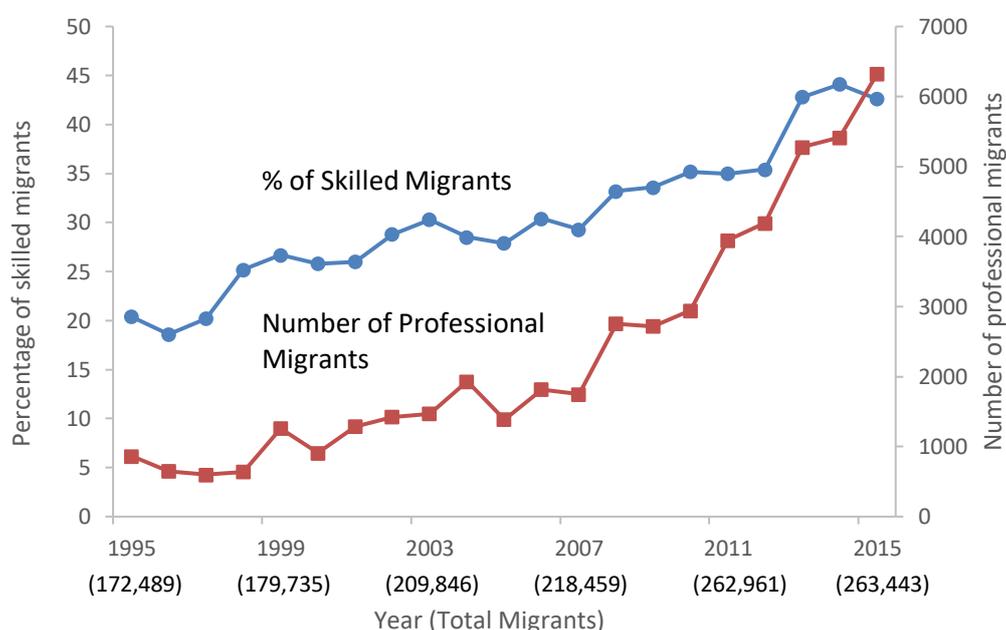
It is worth noting that most of the skilled migrants from Sri Lanka start their journey as students studying abroad (Jayawardhana & Jayathilaka, 2009), in particular, for graduate studies. Moreover, most of the Sri Lankan students migrate to pursue their graduate studies as the first step to obtain permanent residency in that country. Therefore, these students become part of the brain drain as they rarely return home after completing their higher studies.

Figure 3.4 shows most popular destinations for student studying abroad from Sri Lanka for tertiary education from 1999 to 2012. There was a rapid increase in student migration to the U.S.A, the U.K., Australia and Japan until the late 2000s. However, there is a declining

²³ The information comes from the country profile data of the Department of Immigration and Border Protection, Australian Government (2013). Also available at <http://www.immi-gv-au.net/media/statistics/country-profiles/files/sri-lanka.pdf> (accessed on 5th December, 2014)

trend of student migration to Japan since 2007, the U.S.A. and Australia since 2009, and the U.K. since 2011. Moreover, student migration to India and New Zealand has increased significantly after 2010. The declining trend in major destinations can be attributed to the flourishing private universities and graduate schools within the country in recent years. However, increasing student migration to India is a recent trend. India has become a popular destination for IT education among Sri Lankan students. Moreover, Sri Lanka's growing per capita income has made foreign education, particularly in India, affordable for middle-income families. This is due to the close proximity. Restriction imposed in 2012 by the U.K. government on post-graduation working visa might have caused the declining trend of student migration to the U.K. Apart from the student migration trends, more specific migration patterns of skilled people are presented in Figure 3.5.

Figure 3.5: Skilled Migrants as a Percentage of Total Migrants and Number of Professional Migrants in Sri Lanka, 1995-2015



Note: The secondary Y axis of the figure indicates the data series Number of Professionals migrants. Professional migrants refer to migrants who “increase existing knowledge, apply scientific or artistic concepts and theories, or teach in a systematic manner. Professionals include engineers, lawyers, economists, computing professionals, teachers and health professional that require skills at graduate and postgraduate education” (DCS, 2017,09). Numbers in the parentheses beneath years are the total number of migrants in respective years.

Source: Wikramasekara (2010, p. 10); CBSL (2018).

As shown in Figure 3.5, the share of the skilled migrants as a percentage of the total migrants has increased from 20 percent in 2000 to 35 percent in 2012. The share has further increased to 42.6 percent by 2015. Moreover, the number of professional migrants has increased almost by four folds from 2000 to 2012. The number of professional migrants, which was 4,192 in 2012, increased to 6,323 in 2015, indicating a 50 percent growth rate.

This section presented the migration trends of skilled people in Sri Lanka. Other than that, empirical findings suggest that brain drain is a severe problem in some professional fields. Adams (2003) identified Sri Lanka as a skilled labor-exporting country. In 2000, the migration rate of skilled people was 28.2 percent in Sri Lanka (World Bank, 2012), which was the third highest rate in Asia. According to Dumont and Zurn (2007), Sri Lanka has a very high expatriation rate of health professionals such as doctors and nurses to the OECD countries compared to other countries in the region. The brain drain of health professionals has negatively affected the health sector of the country. For instance, there were only 800 specialist doctors and 0.589 physicians per 1,000 people to serve 20 million people in 2006 (Jayawardhana & Jayathilaka, 2009). Moreover, most of the management accountants in Sri Lanka seek employment opportunities in other countries. For instance, by 2008, more than 50 percent of the Chartered Management Accountants (U.K. qualification) were working abroad (Jayawardhana & Jaythilaka, 2009). Further, the number of scientists, which stood at 13,286 in 1996, has declined by 40 percent to 7,907 in 2006 (Anas & Wickremasinghe, 2010). Therefore, in general, Sri Lanka is suffering from brain drain in many professional fields.

3.4 The KSI in Sri Lanka

This section presents an overview of the KSI in Sri Lanka. The KSI in Sri Lanka achieved rapid growth over the last decade despite the fragile economic conditions due to the global financial crisis in 2009 and the civil war in Sri Lanka that continued until the mid-2009. The growth is remarkable in terms of exports growth (both in volume and market diversification), employment generation and business formation. The industry is expected to achieve US\$ 5

billion export revenue, generating 200,000 direct jobs and creating 1,000 startups by 2022 (SLASSCOM, 2014).

In order to understand the growth trajectory of the KSI and its relative importance in the Sri Lankan economy, the next subsections will present the formation and subsequent growth of the industry and its current status compared to other major exporting sectors.

3.4.1 What is the KSI?

Simply, the KSI represents the firms that are involved in knowledge-intensive services. However, it is difficult to find a unique definition due to the diverse nature of knowledge services. The Board of Investment (BOI) (2014) of Sri Lanka defined the KSI as a combination of IT services firms, Information Technology enabled Services firms (ITeS), BPO firms, KPO firms and IT training institutions. Not only the BOI Sri Lanka, but also the A.T. Kearney Inc, a global consulting firm, defined KSI in Sri Lanka as a combination of IT firms, BPO firms and KPO firms (A.T. Kearney Inc, 2012). Although it refers to the same industry, SLASSCOM limits its scope to IT services firms and Business Process Management (BPM) firms. Yet, BPM is an umbrella term that is used to describe activities such as ITeS, BPO and KPO. Moreover, Export Development Board (EDB) Sri Lanka has introduced ICT/IT industry, as a separate industry in their promotion activities. However, firms that have been involved in telecommunication services and ICT products are excluded from KSI. As it is reflected here, KSI are connected to several technical jargons such as ICT, IT services, BPO and KPO, which need some clarifications. Definitions of these key terms are provided in Table 3.2.

Based on the definitions provided in Table 3.2, it is clear that some of these terminologies are not mutually exclusive. For instance, KPO is a sub-set of the BPO. If a firm outsources business activities to another firm, it is recognized as BPO. On the other hand, if the outsourcing is extended to high value-added operation or core business functions, it is recognized as KPO. Moreover, IT services, ITeS and BPO are common components of both

KSI and ICT services. The difference between KSI and ICT mainly arises from telecommunication services and KPO.

Table 3.2: Key Definition of Technology Related Concepts

Concept	Abbreviation	Definition
Information and Communication Technology services	ICT services	A combination of communications services and computer and information services. The former refers to services such as telecommunications, postal services and teleconferencing and support services, whereas the latter refers to “services related to database, data processing, software design and development, maintenance and repair and news agency services” (World Bank, 2010, p. 41).
Information Technology	IT	This refers to information processing with the help of software, hardware, communications technologies and related services. However, embedded technologies that do not generate data for enterprise use are not included within the scope of IT (Gartner IT Glossary, 2015). Also available at http://www.gartner.com/it-glossary/
Information Technology services	IT services	This refers to the application of business and technical knowledge to create, maintain, optimize and provide access to information and business knowledge (Gartner IT Glossary, 2015). Also available at http://www.gartner.com/it-glossary/
Business Process Outsourcing	BPO	This refers to “transferring certain value contributing activities or processes to another firm to save costs and for the principal to focus on its areas of key competence” (Ramachandran & Voleti, 2004, p. 49)
Knowledge Process Outsourcing	KPO	This refers to the “outsourcing of core functions and high value-added operation such as research and development activities, data mining and analysis, brand management, designing and legal services” (Mudambi & Tallman, 2010, p. 1436).

Source: Compiled by author.

Activities related to telecommunication services are coming under the ICT services but excluded from KSI, whereas KPO activities are part of the KSI but excluded from ICT services. However, ICT and KSI have a strong linkage due to a larger share of common

components; IT services, ITeS and BPO. Therefore, if the KSI data are not available, ICT services data have been presented as a proxy indicator of the KSI. The slight differences in these terminologies, as mentioned above, have made comparisons more difficult between different definitions available. Therefore, I employed the official definition adopted by BOI Sri Lanka to define KSI with some modifications. Accordingly, in this study, KSI is defined as a combination of IT services firms, ITeS firms and firms involved in BPO or KPO (BOI, 2014).

3.4.2 The beginning

This section presents the initiation of the KSI in Sri Lanka. In order to make personal names anonymous, two letter codes (for instance AB) will be used. In the 1970s, MNCs such as IBM provided computer solutions as a bundle of hardware, software and middleware products (Pandey et al., 2006). Such products were installed in developing countries by establishing their own branches or through special agents in those countries. Similarly, IBM Sri Lanka has played the vendor's role by acting as a sales and customer care center of the parent company. In 1962, the IBM Corporation started its operation in Sri Lanka with five employees. The first client of IBM was Sri Lanka Insurance Corporation where IBM automated some parts of the operation of Sri Lanka Insurance Corporation by installing the first Mainframe Machine in the country (Chandrasekera, 2012). Since then, IBM Sri Lanka has played a significant role in the process of computerizing various public and private institutions in Sri Lanka (for instance, Sri Lankan Airline in 1983; Sri Lanka Port Authority in 1986; Sampath Bank in 1988²⁴) by deploying their end-to-end IT infrastructure solutions. The presence of IBM, an IT giant, created a new area of specialization among the engineers in Sri Lanka, in particular in the 1970s and 1980s. IBM has produced a large number of System Engineers since its inception in Sri Lanka. Moreover, IBM introduced Personal Computers

²⁴ Sampath Bank Ltd was the first commercial bank to employ a fully computerize operation system in Sri Lanka (Chandrasekera, 2012).

(PC) to Sri Lanka in 1984 (IBM, 2012) laying the first founding stone of the ICT revolution in the country. In spite of introducing computers and automated Application Products to the Sri Lanka economy, its contribution to the KSI is largely negligible. Even in recent times, IBM Sri Lanka is not doing major innovative and development activities and mainly caters to the Application Product market in the country.

Meanwhile, several local firms had incorporated as partners of international vendors such as Microsoft or suppliers of hardware items to the public and private organizations. For instances, Data Management System²⁵ Ltd (DMS), which was incorporated in 1977 aiming at leveraging advantages in the hardware market, entered into partnerships with several MNCs in the early 1980s. Notably, in 1983, DMS became a Sri Lankan distributor of PC and local area networking equipment of Wang Laboratories Inc. (DMS, 2014). In the early 1990s, DMS partnered with Memorex Telex, who is a part supplier of IBM computers. In recent years, DMS has been a key partner of global technology giants such as Microsoft, Oracle, HP and Apple in Sri Lanka (DMS, 2014). However, until the early 1990s, DMS had been dominantly involved in the hardware reselling and ICT education sector. Similarly, MillenniumIT (formally Computer Land) was an authorized reseller of Sun Microsystems and involved in system integration until 1996. Moreover, Zillions (formally ESKAYCEE), which was incorporated in 1979, predominantly focused on hardware business through partnership agreements with international vendors until 1999.

In the 1980s and early 1990s, the IT sector in Sri Lanka was dominated by local business conglomerates and MNCs such as IBM (Abeyasekare, 2011). Initially, local conglomerates started establishing specialized IT departments within themselves to facilitate in-house operations among subsidiaries. For instance,²⁶ John Keells Holdings (JKH) is one of the largest business conglomerates in Sri Lanka, consisting of 70 subsidiaries (currently) that

²⁵Official website, DMS Ltd. Available at <http://www.dmselectronics.com/dmse-overview>

²⁶ Based on the discussions with a representative of JKH

belong to various sectors such as banking, aviation, tourism, agriculture and manufacturing. In order to standardize the common operations of a large number of subsidiaries, JKH started a separate IT department to handle computer operations of the group in the late 1980s.

Most of these early comers to the KSI did not focus on the outward looking IT sector, BPO and KPO. The only exception is Informatics Group of Companies, which was founded by a returned entrepreneur GW. He returned to Sri Lanka after completing his master's degree in system engineering at the University of Aston in the U.K. He had worked in the U.K. and Belgium for a decade.²⁷ Informatics is the first IT and BPO company in Sri Lanka, which was incorporated in 1983 upon the arrival of GW. The company established its first foreign branch in the U.K. in 1993 (Informatics Institute of Technology, 2014). Nonetheless, in the early 1980s, the industry was not booming in Sri Lanka due to a lack of specialized human capital and a supporting legal environment. Therefore, most of the early comers to the industry had to focus on ICT education in the country.

3.4.2.1 ICT education in Sri Lanka

Although Sri Lanka is endowed with a comparatively high level of human capital than other developing counterparts, until the early 1990s, it did not have a specialized workforce in the ICT sector. The demand was fulfilled by non-degree awarding institutions in the early 1980s. For instance, in 1981, BR, an acclaimed intellectual in the Sri Lankan KSI, founded the IDM (Pvt) Ltd, which was the first computer training institution in Sri Lanka.²⁸ However, the founding stone of the ICT education in Sri Lanka was laid by a returned academic, Professor AI, who is renowned as the father of the internet in Sri Lanka (DiGiT, 2014).²⁹ Professor AI returned to Sri Lanka in 1981 after completing his Ph.D. study at Imperial Collage London. In 1985, he founded the Department of Computer Science and Engineering

²⁷ Directors profile, Lanka Hospital Ltd. Available at <http://www.lankahospitals.com/index.php?route=information/directorprofile&info=48&iframe=true&width=600&height=400>.

²⁸ Official website of the IDM Institute. Available at <http://idm.nodes.lk/file.php/1/NewWebSite/AboutUs.html#>

²⁹ Also available at <http://digit.lk/interview-with-prof-abhaya-induruwa-father-of-internet-in-sri-lanka/>

at the University of Moratuwa, which is the best university for engineering and technical education in the country. He continued as the Head of the Department until 1998. See DiGiT (2014) for more details on how he had effectively utilized his foreign networks to overcome supply shortage of qualified academics and resources in the ICT field. However, due to the civil unrest from 1987 to 1990, the first batch of 16 students of the department could not graduate until 1993. In 1994, the department increased its student intake by more than twofold as a way to meet the growing demand for IT professionals in the country.

As a result of the supply shortage of IT professionals, led by the closure of national universities in the late 1980s, non-degree awarding institutions started flourishing in the early 1990s. It should be noted that in the early 1990s, GW played an important role in uplifting ICT education in Sri Lanka. In 1990, he founded Informatic Institute of Technologies as a specialized institution to offer ICT-related education in Sri Lanka.³⁰ The first batch of 22 students graduated from Informatic Institute of Technologies in 1994, with the appreciation of the Sri Lankan President at that time, J.R. Jayewardene. In 1996, he initiated the Sri Lankan Chapter of British Computer Society (BCS) in Sri Lanka and also held the position of Chairperson of the Chapter in the founding year (BCS, 2015).³¹ The streamlining of the supply of IT graduates in the early 1990s facilitated the IT boom in Sri Lanka in the mid-1990s.

3.4.2.2 ICT-related legal environment

Until the early 2000s, the ICT-related legal environment was not protective in Sri Lanka. Table 3.3 shows the ICT related Acts implemented in Sri Lanka.

³⁰ See more at: <http://www.iit.ac.lk/about-iit/history.aspx#sthash.nBXRfP9E.dpuf>

³¹ <http://bcssrilanka.org/past-executive-committees.html>

Table 3.3: ICT Related Acts in Sri Lanka

Description	Effective period	
	From	To
Code of Intellectual Property Act (No 52 of 1979)	1979	2003
Sri Lanka Telecommunications Act (No 25 of 1991)	1991	1996
The Science and Technology Development Act (No 11 of 1994)	1994	up to now
Intellectual Property Act (No 36 of 2003)	2003	up to now
Electronic Transaction Act (No 19 of 2006)	2006	up to now
Computer Crimes Act (No 24 of 2007)	2007	up to now

Source: Gunawardene and Wategama (2003); Weerasinghe and de Silva (2009).

Intellectual property rights related to software and hardware were not well-covered by the Code of Intellectual Property Act of 1979, which governed the intellectual property rights related issues in the country. In 2003, the Intellectual Property Act was introduced in lieu of the 1979 Act. In the new Act, several provisions have been included as remedial measures to protect the intellectual property rights related to software and computer programs (Weerasinghe & de Silva, 2009). Among them, recognizing patent rights for 20 years, industrial design for five years and registered marks for ten years, are significant improvements. Further, provisions were made in compliance with the requirements of the World Trade Organization (WTO). In 2006, the Electronic Transaction Act also facilitated the growth of the KSI as most of the transactions in the industry were made through electronic transaction media. The Computer Crimes Act of 2007 further strengthened data protection by criminalizing unauthorized use of software and issues pertaining to computer-related crimes (Weerasinghe & de Silva, 2009).

Similarly, liberalization of the telecommunication sector positively affected the KSI and its growth. There was a government monopoly in the telecommunication sector in Sri Lanka until 1995. Since 1989, private mobile phone companies were in operation, making Sri Lanka the first South Asian country to do so (Gunawardene & Wategama, 2003). However, with the

privatization of the Sri Lanka Telecom Corporation in 1996, the government monopoly in the telecommunication sector ended. Moreover, in the mid-1990s, Internet access also became available on a commercial basis (Gunawardene & Wattegama, 2003). Therefore, changes in telecommunications and the ICT related legal environment since the mid-1990s have positively affected the KSI in Sri Lanka.

In the early 1990s, ICT education and ICT related legal environment was improving in Sri Lanka. These improvements helped the rapid growth of the KSI in subsequent years. The subsection 3.4.3 presents the recent trends in the KSI growth.

3.4.3 Booming KSI

The KSI, in its present structure, began to emerge in the mid-1990s. This time, REs, who studied and worked abroad, took a leading role to bring the industry to its present level. Contrary to the inward-oriented nature of the existing MNCs and local conglomerates, these REs expanded the product diversity and the export-oriented nature of the industry. For instance, while IBM and Zillions (Pvt) Ltd were still playing a vendor role in the mid-1990s, Virtusa and hSenid³² started their development centers in Sri Lanka in 1995 and 1997, respectively. While Virtusa catered to international companies by being engaged in BPO and IT services from the beginning, hSenid, in its early days, started developing software products related to human resource management for the local market. In the former case, the returnee contributed to internationalizing industry while in the latter case the returnee has contributed to expanding the product diversity. The industry achieved rapid growth in recent years and its growth can be traced in several ways.

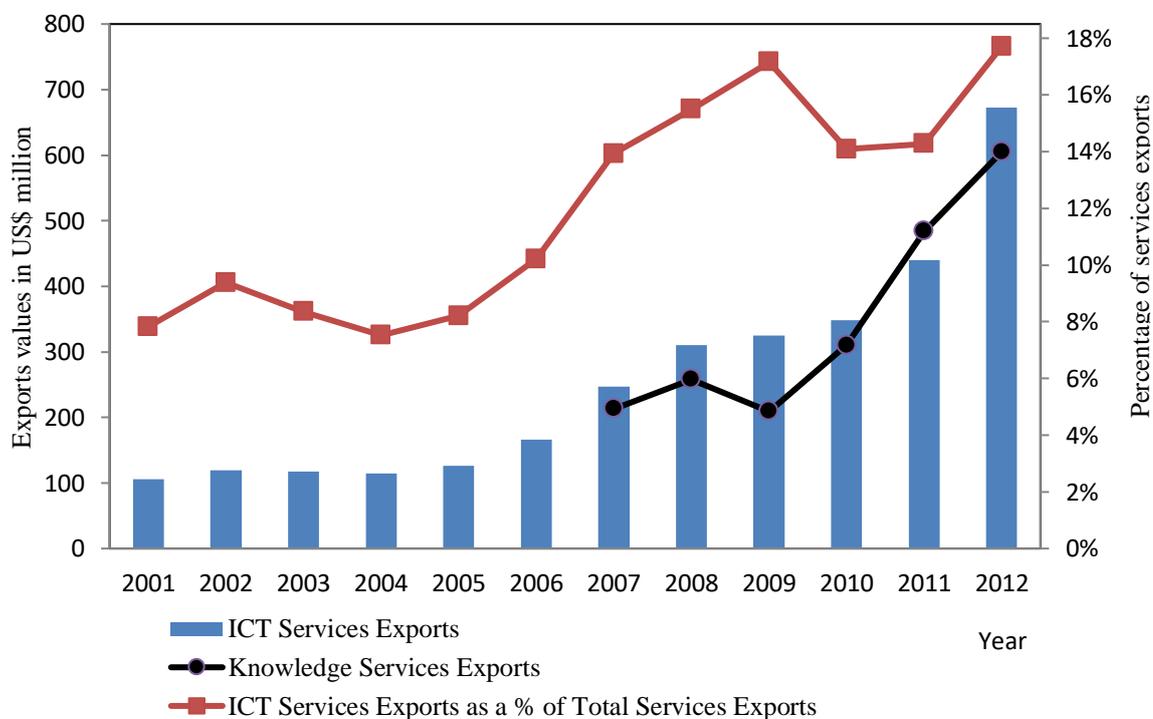
First, the KSI in Sri Lanka has become a popular destination for BPO and KPO in the world. For instance, Sri Lanka ranked 16th on the AT Kearney Global Services Location Index in 2014 (A.T. Kearney Inc, 2014, p. 3) and advanced to 11th place in 2017 (A.T. Kearney Inc, 2018, p. 10). The country was awarded the Outsourcing Destination of the Year 2013 by the

³² hSenid is a name of a knowledge services firm established in Sri Lanka

National Outsourcing Association of the U.K. (CBSL, 2013). A high-level of human capital, English speaking workforce, recent infrastructural development, especially, IT infrastructures such as 3G and 4G communication technologies, private sector driven competitive telecommunication sector, minimum government regulations, secured property rights and information security have boosted the competitiveness of the industry at the global level (A.T. Kearney Inc, 2012).

Second, KSI has attracted global giants in the IT and BPO sectors such as IBM, Microsoft, HP, HSBS, WNS, Amba Research, Motorola and IFS, along with small and medium scale MNCs. An increasing number of MNCs in the industry is an indication of its growth potential. Apart from the global MNCs, there are a growing number of multinational grown-up firms within the industry such as Virtusa, WSO2, Millennium Information Technologies and hSenid.

Figure 3.6: ICT Services Exports, Knowledge Services Exports and ICT Services Exports as a Percentage of Total Services Exports in Sri Lanka, 2001-2012



Note: Refer secondary axis for ICT services exports as a % of total services exports. Refer Table 3.2 for the definitions of ICT services and knowledge services.

Source: World Bank (2013); SLASSCOM (2014); CBSL (2013).

Third, export earnings of the KSI have grown exponentially over the last few years. Among the top 20 exporting brands of Sri Lanka in 2016, five brands, in raking order; Virtusa (3rd), Millennium IT (5th), hSenid (7th), WSO2 (11th) and WNS (20th) were from the KSI (Brand Finance Lanka, 2017, p. 27). Figure 3.6 shows the growth of knowledge services exports from 2007 to 2013, ICT services exports over the last decade together with its contribution to the services export in Sri Lanka.

In terms of export performances, the industry has grown by an annual average of 40 percent from 2007 to 2013. The global economic crisis in the years 2008 and 2009 has negatively affected the export growth of the industry. However, it has quickly recovered more strongly after the crisis by achieving over US\$ 700 million estimated export revenue in 2013, which stood at US\$ 209 million in 2009.

The data on knowledge services exports is not available for the years before 2015 due to a lack of disaggregated information on KPO exports. As discussed in Section 3.4.3, ICT services exports and knowledge services exports are closely related. Figure 3.6 clearly indicates the co-movement of ICT services export and knowledge services export. Therefore, I employed ICT services exports as a proxy for knowledge services exports to understand the growth momentum of the industry in the last decade.

The export earning of ICT services had stagnated around US\$ 100 million until 2006. Yet, ICT services achieved rapid growth since then (see Figure 3.6). As presented in Table 3.4, ICT services export has increased by 41 percent from 2003 to 2006. The exports growth more than doubled in the period 2006-2009, achieving a 96 percent growth. The growth rate has further increased to 107 percent in the period 2009-2012. In addition, according to the CBSL (2018), ICT exports were US\$ 847 million in 2015. Therefore, it is clear that the export earnings of the industry have increased remarkably over the last decade.

Not only the absolute growth but also the relative importance of KSI in the export sector has increased. The industry became the fifth largest foreign exchange earnings source of the

country in 2012. The contribution of ICT services to the total services export has almost doubled from 2001 to 2013. The share of ICT services exports in the services exports has increased from eight percent in 2001 to 18 percent in 2012 (see Figure 3.6).

Table 3.4: ICT Services Exports & Employment and Business Startups Growth within KSI in Sri Lanka: 2003-2012

Item	Year				Growth (%)			
	2003	2006	2009	2012	2003/06	2006/09	2009/12	2003/12
ICT services exports ^b	118	166	325	673	41	96	107	471
ICT employment ^a	15586	30120	42821	66518	93	42	55	327
Business startups ^a	67	115	169	220	72	47	30	228

Notes: (a) Cumulative number at the end of each year; (b) Annual exports in US\$ million.

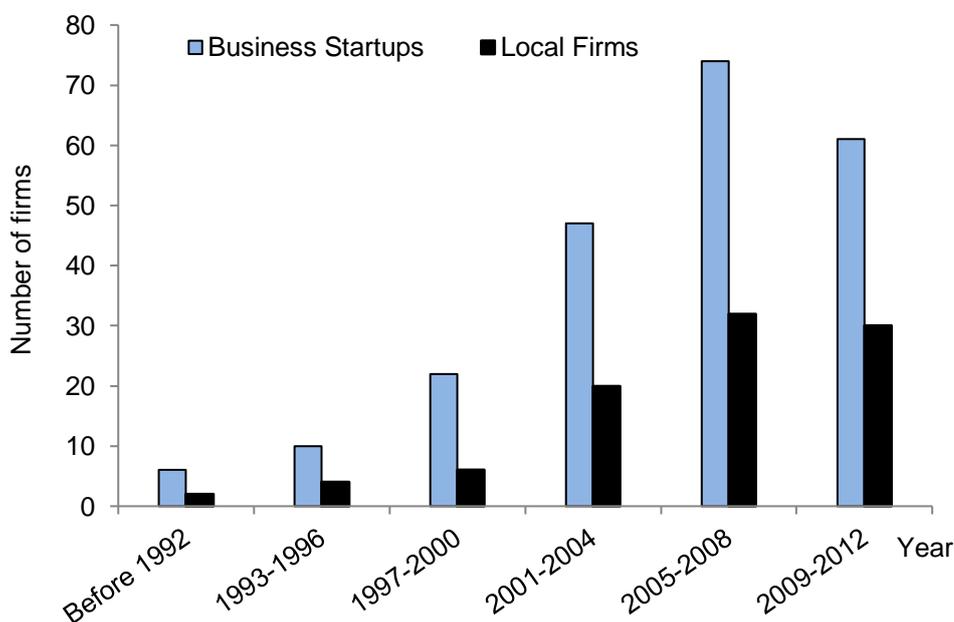
Sources: ICTA (2010, 2013); World Bank (2012); SLASSCOM (2013); EDB (2013); BOI (2013); Author's survey data (2013).

Fourth, employment in the KSI has increased significantly in the last few years. More precisely, according to the data presented in Table 3.4, ICT employment has increased by 327 percent from 15,586 in 2003 to 66,518 in 2012. In the reference period between 2003 and 2006, employment increased by 93 percent. Due to the negative effects of the global financial crisis, employment growth gradually declined to 42 percent in the 2006-2009 period. However, it recovered in the post-crisis period by achieving a 55 percent increase in the 2009-2012 period. The industry has provided these new employment opportunities to the educated youth of the country. Sri Lanka has reduced its general unemployment to less than 5 percent. However, unemployment among the educated, in particular, the educated youth at the age of 20~29, is a severe macroeconomic issue (CBSL, 2013). Therefore, the employment opportunities generated by the industry has contributed to solving the unemployment among the educated youth in the country.

Fifth, business formation in the KSI has been remarkable in the last decade. As per the available data sources, there are over 290 firms at the time of the survey. Yet, according to some other sources, the number is more than 1,000 including the unregistered firms. The

number of knowledge services firms increased by 228 percent in the last decade (Table 3.4), however, at a declining rate. Business startups increased by only 47 percent from 2006 to 2009 compared to a 72 percent increase from 2003 to 2006. The growth rate further declined to 30 percent for the period from 2009 to 2012. In the early stage of the industry growth in the early 2000s, premium profit and profitable opportunities could encourage newcomers to the industry. However, when the industry reaches its maturity, these profitable opportunities and premium profits tend to diminish by discouraging newcomers. This is an inevitable consequence in a small country like Sri Lanka due to the resource limitation in terms of skilled employees and other related infrastructure. On the other hand, the industry is growing rapidly in terms of exports and employment generations. Therefore, it suggests that firms already operating in the industry have become larger while restricting the newcomers.

Figure 3.7: Business Start-up and Share of Local Firms in KSI in Sri Lanka, 1992-2012



Sources: SLASSCOM (2013); EDB (2013); BOI (2013); Author's survey data (2013).

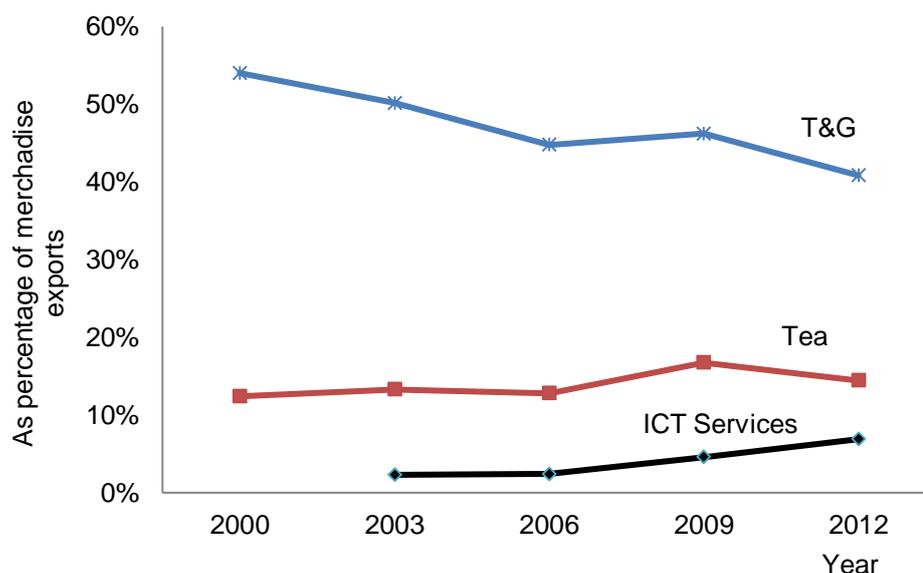
Figure 3.7 shows the business start-ups within KSI from 1992 to 2012. BOI Sri Lanka and other related institutions classify business firms into three categories; foreign, local and joint ventures, based on the ownership type of the firms. Firms fully-owned by Sri Lankan

nationals (Local firms in the figure) as a share of the total business startups have gradually increased from 27 percent in 1997-2000 to 50 percent in 2009-2012. However, the official classification is not suitable for brain circulation research as these institutions consider only the current nationality of the investors. Sometimes, firms founded by the REs, who have given up their Sri Lankan nationality to receive a permanent residency in another country, might have been classified as foreign firms. Nonetheless, Figure 3.7 shows that the number of local entrepreneurs in the industry has increased.

It is generally agreed that a peaceful environment in a country is a pre-condition for industrial growth. If the country is in the middle of civil war, weak security conditions would significantly discourage investment, in general, and investment in knowledge services in particular. According to Figure 3.7, about 34% of the firms started their operations in Sri Lanka between 2005 and 2008. This is the period during which the civil war in Sri Lanka was at its peak. Thus, it suggests that KSI started its current growth in the absence of a peaceful environment.

Finally, the relative share of KSI in the export sector has increased. Exports of ICT services as a percentage of merchandise exports reached 7% in 2012, and a further 8.5 percent in 2017 (CBSL, 2018). This is a significant trend as the two main foreign exchange earners, namely, T&G and tea, are losing their former glamour. As shown in Figure 3.8, the share of the T&G export in the merchandise exports continuously declined from 54% in 2000 to 41% in 2012. And, the share of the tea exports has stagnated around 12~15 percent of merchandise exports from 2000 to 2012 (CBSL, 2013). The number was 13 percent in the year 2017 (CBSL, 2018). It should be noted that the decline of T&G and tea exports does not automatically increase the share of knowledge services as the value of knowledge services is not included in the merchandise exports.

Figure 3.8: Exports of T&G, Tea and ICT Services as a Percentage of Merchandise Exports in Sri Lanka, 2000-2012



Source: CBSL (2005, 2010, 2015).

As mentioned earlier, both T&G and tea industries employ the unskilled workforce of the country, whereas a growing share of ICT services exports implies growing employment opportunities for the educated workforce of the country. The size of the KSI in the context of Sri Lanka is difficult to measure as disaggregated data on the industry is not available in the National Accounts. Therefore, as a final step, I compare export earnings of knowledge services with other exchange generating sources. The comparative data for major exporting industries in Sri Lanka for the years 2012 and 2017 are presented in Table 3.5. Two indicators were used for the comparison of the relative size of each industry, namely, export value as a percentage of GDP and as a percentage of total exports.

T&G industry dominates the exporting sector and the sector accounted for US\$ 3,991 million exports in 2012. The export earnings of T&G increased by 26 percent between 2012 and 2017. However, its relative share in GDP and total exports has declined. T&G exports as a percentage of GDP has declined by 1 percent from 2012 to 2017 and, for the same period, T&G exports as a percentage of total exports has declined by 3 percent. The declining trend is similar for the tea, rubber products; and travel and transportation industries. Historically, the tea industry was the dominant foreign exchange generating source of the country. Then,

T&G surpassed the traditional agro-based exports such as tea, rubber and coconut.

Nonetheless, the value addition of T&G is much lower than the actual export value due to the high dependency on the imported raw materials.

Table 3.5: Comparison of KSI and Major Exporting Industries in Sri Lanka, 2012 & 2017

Item	Values in US\$ million		Percentage of GDP		Percentage of Exports	
	2012	2017	2012 (US\$ 59,400 million)	2017 (US\$ 87,200 million)	2012 (US\$ 13,574 million)	2017 (US\$ 19,120 million)
<u>Merchandise Exports</u>	9,774	11,360	16	13	72	59
T&G	3,991	5,032	7	6	29	26
Tea	1,411	1,530	2	2	10	8
Rubber products	859	835	1	1	6	4
Spices	256	406	0	0	2	2
<u>Services Exports</u>	3,800	7,760	6	9	28	41
Travel and transport	2,673	2,376	5	3	20	12
Knowledge services exports	604	786	1	1	4	4

Source: CBSL (2018); SLASSCOM (2014).

In 2012, knowledge services exports accounted for US\$ 604 million becoming the fifth largest exchange earning source of the country. The number grew by 30 percent from 2012 to 2017 and continued to be the fifth largest exchange earning source of the country in 2017. As indicated in Table 3.5, relative shares of knowledge services exports in the GDP and total exports were stable in 2012 and 2017. While T&G is declining its competitiveness in the international market and tea exports is stagnating, knowledge services exports are emerging as a new source of foreign exchange in Sri Lanka.

3.4.4 Brain circulation in the KSI

The KSI in Sri Lanka is experiencing a lower attrition rate compared to the other sectors in the country. According to ICTA (2013), the attrition rate of knowledge service workers remained seven percent, which is comparatively lower to the high rate of attrition reported in

other countries such as India. Importantly, out of the seven percent, only four percent has contributed to brain drain (ICTA, 2013). The rest of the three percent are intra industry transfers.

In support of the above, I found around 40 REs and nearly 200 RSEs during the preliminary survey. Most of the leading firms in the industry, for instance Virtusa, WSO2, 99X Technologies, Sysco LABS (Previously Leapset), are founded by REs. This suggests that the industry is benefiting from brain circulation. Moreover, there are some emerging pieces of evidence to support that skilled migrants are returning to Sri Lanka to capitalize the growing opportunities in the country. For instance, in 2012-2013, over 300 Australian-Sri Lankan citizens permanently returned to Sri Lanka. Out of the total, about 56% were professionals and administrators, mainly from the IT sector. The number was 215 in 2009-2010 with 48% professionals and administrators (Australian Government, 2014).

Therefore, the growth of the KSI has attracted the skilled people in the country and have successfully retained them while offering employment opportunities for RSMs.

3.5 Chapter Summary

This chapter provided an overview of the industrial structure of Sri Lanka, its migration trends of skilled people and the growth of the KSI in recent years. Sri Lanka is a service sector driven economy with a healthy social development and a high level of human capital. In the meantime, it is suffering from migration of skilled people, which is a multifaceted phenomenon in the country. Since its post-independence period, Sri Lanka has experienced five waves of out-migration. The migration has been driven by discrimination of minorities, political instability, ethnic clashes, security reasons and economic reasons.

The Sri Lankan diaspora is mainly concentrated in the Middle East region. In addition, there is a significant diaspora in Canada, the U.K., Italy and Australia. However, the diaspora is divided as Sinhalese and Tamils due to the 30 years of ethnic conflicts between the two ethnic groups.

Popular destinations for skilled migrants in recent years were South Korea, Japan, Italy and Australia. In addition, the U.K., Australia, and the U.S.A. were the popular destinations for student migrants from Sri Lanka. Migration for economic reason is continuing at an accelerating speed in recent years. The proportion of skilled migrants and the number of professional migrants in the total migrants have increased steadily. Simply, Sri Lanka is suffering from brain drain.

While main industries in Sri Lanka such as T&G, tea, and rubber product have stagnated in the export market, KSI has achieved a rapid growth over the last decade and is expected to grow faster in the next five years. Its growth in terms of employment creation, and business start-ups is remarkable in the last decade. In addition, KSI in Sri Lanka has become a popular destination for BPO and KPO in the world. The industry mainly utilizes skilled employees of the country. As a result, it has absorbed the skilled workforce in Sri Lanka that could have otherwise been part of the brain drain. Importantly, there were many REs and RSMs in the industry. Therefore, it is interesting to explore the factors that have promoted brain circulation in a single industry, while the other sectors, and the country as a whole, are experiencing brain drain. This makes Sri Lanka is an interesting case to examine the relationship between brain circulation and industry growth.

As highlighted above, KSI in Sri Lanka is growing very rapidly in the export sector. Its growth in the export market is reflected in various ways. First, the export earnings of the industry have grown rapidly. Second, it has become the fifth largest exporting industry in Sri Lanka since 2012. Third, a few firms in the industry have become the main exporters of Sri Lanka. Therefore, the export orientation of the industry is clearly visible.

CHAPTER 4: Research Methodology

4.1 Introduction

This study employs a combination of quantitative and qualitative approaches to analyze the relationship between brain circulation and industry growth. Section 4.2 presents a brief introduction to the methodology used in this study, followed by a description of the data collection methods used in this study in Section 4.3. Two surveys, namely, a survey of RSMs and another survey of knowledge services firms were employed in the quantitative phase of the study. In the qualitative phase of the study, I rely on a case study method to gain an in-depth understanding of the phenomena. This study employs success stories of several REs and two case studies of prominent knowledge services firms founded by REs within the KSI in Sri Lanka. Section 4.4 presents the hypotheses and the model specifications. I developed five hypotheses to test the relationship between industry growth and brain circulation. Finally, Section 4.5 presents the summary of this chapter.

4.2 Integrated Research

The integration of quantitative and qualitative methods in a single piece of research is an emerging strategy in social sciences and it has evolved as a way to mitigate the inherent limitations of a single method research (Bumhenger, 2000; Creswell, 2009). In the integrated research, the researcher collects both quantitative and qualitative data and employs a broader range of analytical methods. Campbell and Fiske (1959) employed more than one method to analyze the psychological traits of respondents. The new framework proposed by Campbell and Fiske (1959) was employed to increase the reliability and validity of the findings. Jick (1979) highlighted the importance of data triangulation as a way of converging across qualitative and quantitative methods. According to Jick (1979), triangulation is beneficial to test the internal validity and the level of external validity of the research findings. In recent years, the popularity of integrating both quantitative and qualitative methods in a single study

is increasing. Given this paradigm shift, the integrated method has appeared in research methodology textbooks as the third approach to conducting research (Cameron, 2009).

This study employs the integrated research method. Lack of data on RSMs has hindered the ability to assess the impact of brain circulation over time. Therefore, the qualitative method is commonly applied to emphasize the contribution of brain circulation, hence, vulnerable to critics on the general validity of the process (Obukhova, 2009). For instance, most of the works by Saxenian on brain circulation have relied on success stories of REs in Taiwan, China, India and Israel. Therefore, quantitative analyses using random samples are necessary to establish the general validity of brain circulation.

Nonetheless, qualitative analysis is still necessary to uncover the dynamic nature of the brain circulation and its effects at the firm and industry levels. Firm growth is characterized by two different types of growth mechanisms. First, firms can utilize accumulated profits of the firms to fuel the growth. Second, firms may have achieved the growth through acquisition or business amalgamation. In the knowledge and technology-intensive industries, business acquisitions or business amalgamation are common strategies employed by big firms to achieve a rapid growth. Therefore, a purely quantitative analysis would not be capable of explaining the effects of brain circulation at industry-level as it is difficult to capture all of this qualitative information into a quantitative model. For instance, Valista, a firm founded by a returned entrepreneur, started its Sri Lankan operations in 2005. The firm was acquired by Aepona, an international software producer, in 2009. In 2013, Intel Corporation acquired the Aepona group. Thus, at the time of the survey in 2013, Valista, which was founded by a returned entrepreneur, has become a subsidiary of Intel Corporation.

4.3 Data

This section presents the data used in the research.

I collected both primary and secondary data using various data collection techniques. As it is attested by many scholars in the field, lack of data on migrants is the main issue to

understand the process of migration. The problem is significant within the brain circulation literature due to the dynamic nature of the migration of skilled people. Therefore, the primary data plays a significant role in understanding the process of brain circulation. Thus, in addition to the secondary data gathered from various stakeholders, I collected first-hand information through questionnaires, interviews and discussions to better understand the phenomenon.

4.3.1 Key informant interviews and background data collection

In order to collect background information and also to identify fast-growing firms in the KSI, several interviews were conducted with key informants representing industry associations, government agencies, universities and other related organizations.

Table 4.1: List of Organizations Approached for the Key Informant Interviews and Background Data Collection

Category	Name of the organization
Industry Associations	SLASSCOM
Government Agencies	FITIS
	ICTA of Sri Lanka
	EDB Sri Lanka
Other	BOI Sri Lanka
	Director of Operation-Orion City, the first knowledge park in Sri Lanka
	Director of Concept Nursery Program*-Sri Lanka Institute of Information Technology (SLIIT), a semi-government IT university in Sri Lanka
	Head of the Department of Computer Science and Engineering, University of Moratuwa, Sri Lanka.
	Academics and professionals in the field.

Note: * Concept nursery program is an initiative to promote business incubations within the KSI in Sri Lanka.

Source: Author's survey data (2013).

Table 4.1 presents a list of interviews conducted in 2013 in Sri Lanka. Several interviews were conducted with the office bearers of SLASSCOM to discuss, initiation, initiators of SLASSCOM and its role in promoting knowledge services. Moreover, the interviewees

helped to finalize success stories of REs in the KSI in Sri Lanka. Also, the chairman of the Federation of Information Technology Industry Sri Lanka (FITIS) was interviewed. Further, several other interviews were conducted as described in Table 4.1 To understand the KSI, its evolution, growth and key players, unstructured guiding questions were asked in all the interviews.

4.3.2 Quantitative data

Two surveys, namely, Survey of RSMs and Survey of Firms, were conducted to collect quantitative data to analyze the determinants of returning decisions of the skilled migrants and the effect of the presence of a returned entrepreneur in a firm on its performances. Detailed explanation of the sampling strategy and sample size of the two surveys are explained in the following subsections.

4.3.2.1 Survey of RSMs

The survey was conducted from late-July to mid-October 2013, targeting the RSMs in the KSI in Sri Lanka. As I defined in Chapter One, a returnee as a skilled migrant if he/she holds tertiary or equivalent educational achievements at the time of returning (Koser & Salt, 1997) and have stayed abroad for more than one year (United Nation, 2011). Further, the returnee was identified as a skilled employee if he/she is an employee, including the position of working directors, of a firm operating within the KSI of Sri Lanka. If the returnee is an own account worker, proprietor, partner or director of a firm incorporated or operating within the KSI of Sri Lanka, he/she was identified as an entrepreneur.

A comprehensive list of RSEs or REs was not available either with government agencies or any industry organizations. Countries usually do not collect information on returning nationals, making returnees the most difficult group to quantify in the migration cycle (Gmelch, 1980). Thus, it is common to use a non-probabilistic sampling such as snowballing techniques to select respondents when adequate information is not available on the population

(Karunaratne & Gibson, 2014). However, this process makes it difficult to generalize the findings due to possible sampling bias in samples.

Therefore, to avoid a similar sampling bias, I employed the cluster sampling method. First, a randomized technique was applied to select knowledge services firms within the KSI of Sri Lanka. At this stage, I collected members' lists from three main organizations; SLASSCOM as the apex body of the industry, the knowledge services firms registered with the BOI Sri Lanka and the EDB Sri Lanka. In addition, a few firms were identified from other sources such as the registered firms under the Concept Nursery program attached to SLIIT. The combined list contained the details of 290 firms. Second, survey questionnaires were distributed to all RSMs among the selected 56 firms. However, the process was challenging as most of the professionals were busy with their work and, in particular, entrepreneurs were busy with their overseas business trips. Nevertheless, it helped to find a random sample of RSMs within the industry in the absence of population details.

Table 4.2: Number of Responding Firms (by Affiliations) Selected for the Survey of Returned Skilled Migrants

Institution	Number of Firms	Contacted Firms	Surveyed Firms
SLASSCOM	152	50	34
BOI Sri Lanka	133	44	29
EDB Sri Lanka	69	15	12
Other	13	11	09
Total	290*	80*	56*

Note: *Some firms have registered in more than one organization. Therefore, the total represents the final number when the repeated observations are eliminated.

Source: SLASSCOM (2013); EDB (2013); BOI (2013); Author's survey data (2013).

Table 4.2 shows the number of firms by their affiliations in the list of firms, the number of firms contacted or approached for the survey, and the number of surveyed firms. Accordingly, there were 152 registered firms in SLASSCOM in 2013, and out of them, 50 firms were selected or contacted for the survey. However, only 34 firms participated the survey.

Therefore, as shown in the last column of Table 4.2, the sample consists of firms registered with various organizations in the KSI in Sri Lanka.

This survey was conducted using a self-administrated standardized questionnaire. The reason for not scrutinizing the most popular online surveys was to make it anonymous and, thereby, achieve a high response rate. Returning decision of a skilled migrant should be influenced by several factors. Blitz (2005), in his study on Spanish medical professionals, presented a single question to determine factors that motivate the returning decision. Gmelch (1980) has correctly pointed out that there are several issues in using a single question to find the underlying factors behind the returning decision. Instead, he emphasized the benefits of offering a set of potential motivational factors that influenced the move and asking the returnee to select them on a five-point Likert scale framework. Therefore, I offered 11 options based on the literature review that could potentially influence the returning decision of the respondents. In a five-point Likert scale framework, respondents tend to choose a moderate or neutral option for several reasons (see Garland, 1991). Thus, I removed the midpoint and offered a four-point Likert scale framework to find the degree of influence of each factor on the returning decision.

The questionnaires were distributed to 205 qualified candidates in 56 firms through a representative of each firm and avoided personal contacts with the respondents as much as possible. In most cases, either the Chief Executive Officer (CEO) or Human Resources Manager of the firm assisted me in reaching the potential respondents. After a few days, the completed questionnaires were collected from the representative of the firm. Prior to the mass data collection, a pilot study was conducted with eight respondents in two firms within the industry and the questionnaire was discussed with industry professionals and academics. During the mass data collection, around 80 of 290 firms were contacted as a representative sample of RSMs. The selection was done by using the “randbetween” command available in Microsoft Excel spreadsheet. The command helps to generate a random selection of

respondents from a list when inserting the range of the serial numbers of the respondents. In this study, the serial numbers ranged from 1 to 290. The list generated by “randbetween” command contained nine duplicate serial numbers.³³ Therefore, the next immediate respondent was selected to replace the duplicate cases.

However, only 56 firms agreed to participate in the survey (see Table 4.2). In total, 232 RSMs were found in those 56 firms. Some of the qualified RSEs and REs were away from the country during the survey period, and some others were not willing to participate in the survey. Therefore, questionnaires were distributed among 205 RSMs comprising 30 REs and 175 RSEs. In response, 131 completed questionnaires were collected with a 64% response rate consisting of 22 REs (response rate 73%) and 109 RSEs (response rate 62%). The response rate achieved is considerably higher than those in similar studies. In the data validation process, a few questionnaires were removed as some respondents had not provided the necessary information.

The limitation of migration data on skilled migrants is well recognized in the literature. For the same reason, the exact number of RSMs in the selected firms within the KSI could not be identified. Nonetheless, I managed to collect the year of establishment, firm size as measured by the number of employees, and the ownership details of 220 firms in the population and the same details for the remaining 70 firms were not accessible. Thus, the population share is calculated based on the average of those 220 firms. A comparison of the sample data and population data is presented in Table 4.3.

³³ The “randbetween” command generates a random sample with replacement by giving an equal probability for each selection. For instance, suppose someone wants to generate five random numbers from a list of 10 (0~10). Let say the randbetween command selected 1, 2, 5, 5 and 8 as the sample respondents giving an equal probability for each selection. Here, number 5 is duplicated. In order to overcome this duplication problem in the present study, I replaced the duplicated number with the next immediate number in the list. If elaborate with the above example, the selected list was 1, 2, 5, 6 and 8.

Table 4.3: Returned Skilled Migrants: Population versus. Sample

Description	Population (220 firms)	Sample (61 firms)
REs	n.a	54%
<u>Year of establishment</u>		
Before 1992	3%	2%
1993-1996	5%	5%
1997-2000	10%	18%
2001-2004	21%	18%
2005-2008	34%	34%
2009-2012	28%	23%
<u>Firm size</u>		
Small (less than 40 employees)	n.a	43%
Medium (40~100 employees)	n.a	23%
Large (Above 100 employees)	n.a	34%
<u>Ownership of the firm</u>		
Local	44%	52%
Joint Ventures	23%	21%
Foreign	33%	27%

Source: SLASSCOM (2013); EDB (2013); BOI (2013); Author's survey data (2013).

The share of the firms founded by REs or managed by REs in the population cannot be calculated due to the lack of information on migration status of the entrepreneurs. The calculated share of the firms founded or managed by REs was 54 percent of the sample. Based on the year of establishment, 3 percent of the firms in the population started before 1992 and the sample share of the same is 2 percent. Firm size, which was calculated based on the number of employees in the firms, was not available for the population. In addition, the sample consists of firms owned by locals (52 percent), joint ventures between locals and foreigners (21 percent) and fully own by foreigners (27 percent). Therefore, although it is small, the sample is a representative sample of the population.

4.3.2.2 Survey of knowledge services firms

I collected firm-level data through a survey of firms, which was also conducted simultaneously with the survey on RSMs. The KSI in Sri Lanka has concentrated in Colombo and suburbs, the commercial hub and the most urbanized area of the country. Although agglomeration has made it easy to access the firms, the restrictive nature of the industry has made it difficult to access the firm-level information. Despite the difficulties, however, I managed to access 61 responding firms that comprise of small, medium and large enterprises.

Table 4.4: Number of Responding Firms (by Affiliations) Selected for the Survey of Firms

Institution	Number of Firms	Contacted Firms	Surveyed
SLASSCOM	152	50	36
BOI Sri Lanka	133	44	31
EDB Sri Lanka	69	15	12
Other	13	11	10
Total	290*	80*	61*

Note: *Some firms have registered as more than one institution. Therefore, the total represents the final number when the repeated observations are eliminated.

Source: SLASSCOM (2013); EDB (2013); and BOI (2013); Author's survey data (2013).

A comprehensive list of knowledge services firms was not available either with industry organizations or related government agencies. Therefore, I employed the firms list created for the survey of RSMs to select the responding firms for the survey of knowledge services firms as well. From the total of 290 firms, 80 firms were randomly selected as explained in Subsection 4.3.2.1 More than 75 percent of the firms, 61 out of the 80 firms, agreed to join the survey, but others refused to disclose firm-specific information.

Table 4.4 clearly shows that the sample is a representative sample of firms from SLASSCOM, BOI Sri Lanka, EDB Sri Lanka and other sources. Moreover, a comparison of sample data and population averages in terms of ownership, size and firm age are presented in Table 4.5.

Table 4.5: A Comparison of Firm-Level Data Between Population and Sample

Description	Population share (based on 220 firms)	Sample share (61 firms)
<u>Ownership of the firm (a)</u>		
REss' firms	n.a	54%
Local firms	n.a	31%
Foreign firms	n.a.	15%
<u>Ownership of the firm (b)</u>		
Local	44%	52%
Joint Ventures	23%	28%
Foreign	33%	20%
<u>Year of establishment</u>		
Before 1992	3%	3%
1993-1996	5%	5%
1997-2000	10%	16%
2001-2004	21%	20%
2005-2008	34%	33%
2009-2012	28%	23%
<u>Firm size</u>		
Small (less than 40 employees)	n.a	41%
Medium (40~100 employees)	n.a	23%
Large (Above 100 employees)	n.a	36%

Note: (a) Author's classification based on the presence of REs.

(b) The official classification of BOI (2013).

Source: SLASSCOM (2013); EDB (2013); BOI (2013); Author's survey data (2013).

According to the BOI Sri Lanka, knowledge services firms are classified as local firms, joint ventures and foreign firms based on the nationality of the investors. However, this classification considers some of the REs' firms as foreign firms because they hold foreign nationality. Therefore, the official classification is not applicable to brain circulation studies, as it classifies firms owned by REs as foreign-owned firms. Therefore, the present study classifies firms as REs' firms, foreign firms and local firms based on the primary data

collected from the responding firms. A firm was classified as REs' firms if, at least, one of the directors is a returned entrepreneur. After excluding REs' firms, the remaining firms were classified as local firms, subsidiaries of local firms, foreign firms and subsidiaries of foreign firms.

The survey was conducted using the semi-structured questionnaires. The effectiveness of face-to-face interviews to achieve a high response rate has been warranted (Brouthers & Xu, 2002). Therefore, I followed the interviewer-administered interviews to collect data. I conducted all the interviews from July to October 2013 in Colombo, Sri Lanka. In most cases, I managed to contact the founder, CEO or Director of the firm (about 90 percent) and the rest of the respondents were senior managers. In some cases, I approached multiple respondents if the first respondent could not provide the necessary information. The questionnaire consists of seven main sections with 29 sub-questions. Respondents were supportive and willing to provide all the information in the questionnaire except question regarding the turnover of the firm. Therefore, I consider the number of employees instead of turnover to measure the firm size and firm growth.

4.3.3 Qualitative data

Two main types of qualitative data were employed. Multiple cases design based on the replication logic (Yin, 2009) was employed to explore the factors that influenced the returning decision of the entrepreneurs. For this purpose, 10 successful REs were interviewed. Case study design, that comprises of two critical cases were employed to explore the effect of brain circulation at the industry level (Yin, 2009). Further details are presented in the subsections. The case study method relies on theoretical sampling rather than statistical reasons as a way to replicate previous cases or highlight the emerging theoretical aspects (Eisenhardt, 1989). Therefore, I employed the snowball technique to select the cases for detailed investigation.

4.3.3.1 Success stories of REs

Ten success stories of REs were analyzed to understand the factors that motivated their decision to return and start a business within the KSI. Purposive sampling using the snowball technique, which is non-probabilistic in nature, was employed to select the cases for further investigation. The selection process started with a tentative list that I created based on a preliminary survey. Most of the firms provided details of the founders and executive directors on their websites. This published information was used to generate the tentative list of REs. In addition, informal discussions were conducted with industry representatives and researchers in the field to identify more REs. There were 16 REs in the initially developed list. Later, during the key informant interviews, the initial list was updated based on the recommendations of the key informants. I ask key respondents to rank the 16 names on the list based on export performance of the firm founded by REs. The final list contains ten successful case studies of REs within the KSI.

In-depth interviews were conducted with the selected REs, or with representatives, using semi-structured and open-ended questions. The first round of the interviews was conducted from July to October in 2013 in Sri Lanka. Except for one, all the other interviews were held at the office premises of the respective respondents, and in one case, the interview was held at the residence of the respondent, which is located in Colombo. Additionally, online documents (www.linkedin.com), videos and other secondary sources were used for data collection. A list of success stories identified is provided in Table 4.6.

Table 4.6: Success Stories of REs

Code and the Category of REs	Name of the firm	Designation	Year Founded	Highest education of REs	Immediate prior experience of REs
<u>Early Movers (EM)</u>					
EM1	Virtusa	CEO & Co-founder	1995	B.Sc. (Syracuse, U.S.A.)	Director at Insci Corp, U.S.A.
EM2	hSenid	CEO & Founder	1997	M. Sc.(Bridgeport, U.S.A.)	Senior Software Consultant at Pepsi, U.S.A.
EM3	Codegen	CEO & Co-founder	1999	Ph.D. (City University, U.K.)	Freelance Consultant, U.K.
EM4	Virtusa	Ex-CEO & Co-founder	1995	B.Sc. (Loughborough, U.K.)	Director at Insci Corp, U.S.A.
<u>Second Generation (SG)</u>					
SG1	WSO2	CEO & Co-founder	2005	Ph.D. (Purdue, U.S.A.)	IBM Research, U.S.A.
SG2	Calcey	CEO & Founder	2002	B.Sc. (California, U.S.A.)	Solutions Architect at, U.S.A.
SG3	Rigcrest	CEO & Co-founder	2005	M.Sc. (Pennsylvania, U.S.A.)	MD at Nasdaq:SCH, U.S.A.
<u>Ex-Employees of EMs (ExEEMF)</u>					
ExEEMF1	99X Technology	CEO & Co-founder	2000	University dropout	CEO at Informatics International, SL
ExEEMF2	Cinergix	CEO & Co-founder	2005	M.Sc. (Melbourne, Australia)	Tutor at Melbourne University Australia
ExEEMF3	Leapset	MD & Co-founder	2010	B.Sc. (Warwick, U.S.A.)	Vice President at Virtusa, SL

Source: Author's survey data (2013)

I keep names of the 10 REs anonymous and they are referred to using codes as defined below. In addition, all the other names are also referred to using codes. I classified ten success stories into three categories; (i) Early Movers (EM), (ii) Second Generation (SG) entrepreneurs and (iii) Ex-Employees of EM firms (ExEEMF). A returnee is classified as an EM if he/she moved to the industry between 1995 and 2000. In the mid-1990s, the KSI in Sri Lanka was not popular locally and globally. These REs are considered as the founders of the industry in its export-oriented nature. In contrast, the KSI in Sri Lanka was booming both locally and globally in the early 2000s. For instance, Carmel & Tija (2005) identified Sri Lanka as an emerging software exporting nation at the global level in 2005 (as cited in Okada, 2010, p. 205). Thus, a returned entrepreneur is classified as SG entrepreneur, if he/she has started their business between 2000 and 2005. The last category represents the ExEEMF and who have later started their own businesses in the industry. In industrial growth, these spinoffs play a significant role in increasing the number of firms in the industry. Therefore, such returnees are classified as ExEEMF. Table 4.6 presents background information on the ten success stories selected for this study.

4.3.3.2 Two case studies of firms founded by REs in the KSI in Sri Lanka

I selected two prominent firms founded by REs, namely, Virtusa by EM1 and WSO2 by SG1, in the KSI in Sri Lanka as case studies to analyze the REs' advantage and its contribution to the business expansions and growth of the KSI in Sri Lanka.

Virtusa was founded by EM1 in 1995 when the KSI in Sri Lanka is at its early stage. Therefore, I recognize Virtusa as an early mover firm to the industry. In contrast, the KSI in Sri Lanka was booming both locally and globally when WSO2 started in 2005. Therefore, WSO2 was recognized as a second-generation firm in the industry. As explained above, these two case studies represent two distinctive stages of the industry growth of the KSI in Sri Lanka.

I conducted an in-depth interview with the Senior Vice President and General Manager of Virtusa-Sri Lanka in September 2013 at the Virtusa office premises in Dematagoda, Sri Lanka. Before he was promoted to the current position in 2012, he had been working as the General Manager of Virtusa since 1997 and was promoted to the post of Vice President and General Manager in 2008. Apart from that, informal discussions were conducted with the past employees of Virtusa. Moreover, secondary information was collected from the company website, annual reports and other online documents. Historical data were collected from various news items published in local and international newspapers on Virtusa.

Then, I conducted an in-depth interview with the founder, CEO and Chairman of WSO2 in September 2013 at his house premises in Dehiwala, Sri Lanka. In addition, then Director of Human Resource Management was interviewed at the WSO2 Sri Lankan office located in Colombo, following the discussion with SG1. Moreover, secondary information was collected from the company website, annual reports and other online documents. Historical data were collected from various news items published in local and international newspapers on WSO2.

4.4 Hypotheses and model specifications

This subsection presents the hypotheses and model specifications used in the research.

I consider five hypotheses to establish the relationship between brain circulation and industry growth, and several econometric models were developed to test the validity of those hypotheses. Issues of using discrete and censored dependent variables in econometric models and hypotheses are discussed in the following subsection.

4.4.1 Estimation issues

The econometric models employ in this study deal with two types of dependent variables; discrete and censored variables. In the former, the dependent variable is a binary variable, which takes one if the given condition is satisfied, or zero otherwise. In the latter, the dependent variable is censored either from the upper limit, the lower limit or both. In such a situation, the usual Ordinary Least Square (OLS) does not produce the best estimates of the

estimated parameters of models (Wooldridge, 2010). Therefore, I employed the probit estimation if the dependent variable is discrete and Tobit estimation if the dependent variable is censored. A brief description of the two specifications is provided below.

Probit estimation: If the dependent variable y_i is a binary variable, the outcome of the binary model can be expressed as follows:

If $y_i = 1$ (observed value of the dependent variable), probability of y_i^* is greater than zero.

If $y_i = 0$, probability of y_i^* is zero.

The condition can be expressed in mathematical form as follows:

$$\text{if } y_i = 1 : y_i^* = \beta_j X_{ij} + u_i > 0 \quad (4.1)$$

$$\text{if } y_i = 0 : y_i^* = \beta_j X_{ij} + u_i = 0 \quad (4.2)$$

In Equation (4.1), y_i^* is a latent variable that can take any value as expressed below;

$$y_i^* = \beta_j X_{ij} + u_i \quad (4.3)$$

Where, X_j represents a set of explanatory and controlling variables, β_j is a set of coefficients to be estimated, u_i is independent and normally distributed error term with zero mean (μ) and constant variance, σ^2 .

We can apply probit estimation to estimate Equation (4.3), assuming a probability distribution for the density function. See Wooldridge (2010), Chapter 15 for more details on the derivation of probit estimations. The probit model estimates odd ratios of each coefficient β_j on the latent variable y_i^* .

Tobit estimation: If the dependent variable y_i is continuous variable with censored outcomes, let's say upper limit 100, and lower limit 0, then the model can be expressed as follows:

$$y_i = 0 \text{ if } y_i^* \leq 0 \quad (4.4)$$

$$y_i = y \text{ if } 0 < y_i^* < 100 \quad (4.5)$$

$$y_i = 100 \text{ if } y_i^* \geq 100 \quad (4.6)$$

In Equation (4.5), y_i^* is a continuous latent variable that can be expressed as:

$$y_i^* = \beta_j X_{ij} + u_i \quad (4.7)$$

where, X_j represents a set of explanatory and controlling variables, β_j is a set of coefficients to be estimated, and u_i is independent and normally distributed error term with zero mean (μ) and constant variance, σ^2 .

Equation (4.7) can be estimated using Tobit model. See Wooldridge (2010), Chapter 16 for more details on the derivation of Tobit estimations. The Tobit model estimates the marginal effect of each coefficient β_j on the latent variable y_i^* .

4.4.2 Hypothesis 1

This hypothesis consists of three sub-hypotheses, namely H 1.1, H 1.2 and H 1.3.

Among several other factors, lack of employment opportunities in the stagnated industrial sector is one of the main determinants of migration of skilled people. Therefore, it is rational to assume that the brain circulation can be promoted if any industry can generate employment opportunities that meet the demand of the skilled migrants. Saxenian (2007) argued that the growing industries are necessary to bring these skilled migrants back. In other words, the availability of employment opportunities and the wage premium are key determinants that influence the returning decision of skilled migrants. Nonetheless, only the fast-growing industries can generate wage premium and employment opportunities for skilled employees. In contrast, those who intended to become entrepreneurs should be more concerned about growing investment opportunities than employment opportunities. This is because the early mover firms are better positioned to earn a higher return on investment and premium profit at the early stage of the industry growth. Therefore, factors that determine the returning decision of an entrepreneur should be different from that of a skilled employee. More specifically,

H 1.1: Industry growth is a significant factor that motivates employees to make the returning decision

H 1.2: Industry growth is not a significant factor that motivates entrepreneurs to make the returning decision

Model 1: Three decades-long civil war, which made Sri Lanka a hidden gem in the KPO/BPO (A.T. Kearney Inc, 2012), came to an end in the mid-2009. Moreover, post-war GDP growth of the country was remarkable with an average of 7.1% per year (CBSL, 2013). These macro factors had a positive impact on brain circulation, but industry-specific factors within the KSI were more prominent because a similar flow of brain circulation has not been observed in any other industries in Sri Lanka. The industry was not well-known until 2007 but has achieved a rapid growth since then. This growth is remarkable as it was achieved even before the end of civil war and despite the fragile economic condition in its major export destinations such as the U.S.A. and the U.K. in 2008 and 2009. Moreover, in 2007, AT Kearney global outsourcing report ranked Sri Lanka at the 29th among the top 50 destinations in the world. It advanced to the 16th in 2009, making the country more important in the global the KSI. Therefore, given a time-lag in making the returning decision, it is rational to attribute the flow of skilled migrants after 2009 to industry growth while giving due recognition to other macro-level determinants such as peace and stability. In line with the above assumptions, I presume that factors determining the returning decision of the skilled migrants might not be the same for industry growth cohort of before 2009 and on or after 2009. Accordingly, choosing 2009 as the reference year, a binary variable was introduced as the dependent variable of the model. The value of the dependent variable takes one if the respondent returned before 2009 and zero otherwise.

$$Yearofreturn (before 2009 = 1) = f (DF_i, HC_i, SF_i, ent_i) \quad (4.8)$$

Several explanatory variables were considered for model specification. As I explained earlier, the growth of the KSI was clearly observable since 2009. Therefore, the probability of skilled employees returning after 2009 should be significantly different from that of the returning entrepreneurs. Growing employment opportunities, wage premium and career progress are the main motives of the employees whereas entrepreneurs are more concerned with investment opportunities, profitability, business environment and other related factors in

the home country. Thus, I tested the significance of the entrepreneur (*ent*) variable, which is a dummy variable taking one if the returnee is an entrepreneur (in 2009), and zero otherwise. Besides being an entrepreneur/employee, several other factors, in particular, demographic characteristics determine the returning decision (Waldorf, 1995; Yendaw, 2013). Therefore, the variable demographic factors (DF) such as age, gender, ethnicity, civil status and nationality of the respondents were included. Moreover, education qualifications and working experience of the respondents were included as human capital (HC) indicators. I classified education qualifications of the RSMs into three levels; diploma, undergraduate and postgraduates. A dummy variable was created to capture the industry-related working experiences of the respondents in foreign countries. If the respondents have had only part-time working experiences, which are not related to knowledge services, the dummy variable takes zero. Further, having school age children at the time of returning was included as a controlling variable for social factors (SF).

Country-specific factors such as political situation and economic stability also could influence the returning decision of the skilled migrants. Nonetheless, due to the nature of the dependent variable, country-specific factors do not vary between before 2009 and after 2009. Therefore, to capture the impact of such factors, hypothesis H 1.3 was considered with a different dependent variable.

The conventional wisdom suggests that the rapidly growing industries in the home country are necessary to encourage brain circulation. However, the REs, who have the cultural identities of Taiwan and close links with the technological centers such as Silicon Valley, played a significant role at the early stage of Taiwan's ICT industrial development (Saxenian & Hsu, 2001; Saxenian, 2007). Therefore, emerging opportunities at domestic or global level could initiate the brain circulation process in a developing country. In the Sri Lankan case, REs played a significant role at the early stage of industrial development. Therefore, both cases suggest that skilled migrants, who intended to start businesses, are more

likely to return if marketable business opportunities are available in the home country. More precisely,

H 1.3: Growing business opportunities in the KSI in Sri Lanka have motivated the returning decision of the entrepreneurs.

Model 2: The sample consists of REs and RSEs. Therefore, the following model was developed to analyze the probability of a RSM becoming an entrepreneur in the KSI. I tested the significance of economic and political factors, in particular.

$$\text{Entrepreneur (yes = 1)} = f(DF_i, HC_i, SF_i, MF_i) \quad (4.9)$$

Where, the *Entrepreneur* is a dummy variable, which takes one if the returnee is an entrepreneur and zero if he/she is a skilled employee at the time of the survey in 2013. The explanatory variable DF consists of age, age squared, gender and nationality of the RSMs. Education of the returnees, education of the returnees' parents, working experiences and entrepreneurial activities of the returnees were considered as HC indicators.

In a similar model, McCormic and Wahba (2001) considered age, gender, education and previous entrepreneurial activities of the skilled migrants. Similarly, Black and Castaldo (2009) included age, gender, foreign education and working experiences prior to migration in a model to estimate the probability of a returnee becoming an entrepreneur. Since brain circulation refers to skilled migrants, HC attributes might not be sufficient to differentiate entrepreneurs and employees. Thus, I assume that transnational capital is a proper indicator than the general HC indicators in brain circulation research as it differentiates the knowledge accrued in the home country and the host country. Therefore, I developed three sub-models with various combinations of education qualification and working experiences of RSMs to test the effects of general HC and transnational capital on the entrepreneurship, separately.

First, I considered the maximum educational attainments and total years of working experiences to explain HC in Equation (4.9), irrespective of whether such qualification acquired in the home country or host country. In Equation (4.10), instead of HC, the

transnational capital, which is denoted as (HC1); overseas education and overseas working experiences, were considered.

$$Entrepreneur (yes = 1) = f (DF_i, HC1_i, SF_i, MF_i) \quad (4.10)$$

Equation (4.11) extends the meaning of transnational capital in Equation (4.10) by introducing working experiences of the returnee in an OECD country.

$$Entrepreneur (yes = 1) = f (DF_i, HC2_i, SF_i, MF_i) \quad (4.11)$$

Scholars have employed proxy variables to test the effect of networking capacity of the returnees on their post-returning activities (Black & Castaldo, 2009; Obukhova, Wang & Li, 2012). Especially, school ties help to overcome impediments to entrepreneurial activities of the returnees due to the institutional support from the school and its alumni (Obukhova et al., 2012). Thus, I employed a dummy variable, which takes one if the RSMs attended a popular school³⁴ in Sri Lanka or zero otherwise, as a SF that supports the entrepreneurial activities. Motivational Factors (MFs), which are dummy variables, represent the socio-economic, cultural and political factors that influenced the returning decision of the skilled migrants. Black and Castaldo (2009) included such MFs in their model to estimate the probability of a returnee becoming an entrepreneur.

4.4.3 Hypothesis 2

As explained by Saxenian (2007), technology, product and market tend to be redefined continuously, and the product cycle tends to take less than nine months. Therefore, REs in the KSI need to maintain a close connection with the technology hubs such as Silicon Valley to be on the technology frontier. Meanwhile, rapid developments in global communication technologies, which enable online real-time human interactions via advanced technology features such as web 0.2, have created a virtual office atmosphere in which location does not

³⁴ In Sri Lanka, primary and secondary education is offered by both private and public sector schools. Among public schools, few schools are managed by the central government while others are controlled by the provincial governments. The schools managed by the central government are named as national schools. These national schools are the first choice of parents to send their children. The next choice is the private schools in major cities. These national schools and private schools are considered as popular schools in Sri Lanka.

play a crucial role. Nonetheless, some scholars criticize the contextual validity of the brain circulation due to its temporal nature (for instance, Harvey, 2009). Therefore, the second hypothesis looks into the returning decision of the respondents; whether it is permanent or temporal. More precisely,

H 2: Returning decision of entrepreneurs is more temporal than that of the employees. Therefore, the temporal nature of brain circulation is more applicable to entrepreneurs than the skilled employees

Model 3: A regression model was developed to test the above hypothesis. Accordingly, the model analyzes the determinants of returning decision of the skilled returnees employing the following model specification,

$$RD (\text{Permanent} = 1) = f (DF_i, HC_i, SF_i, ent_i) \quad (4.12)$$

Where, RD is a dummy variable, which takes one if the returning decision of the skilled migrant is permanent, and zero if it is otherwise. To the best of my knowledge, the temporal nature of brain circulation has not been addressed using a quantitative model. In Equation (4.12), DF consists of age, age squared, gender, civil status and nationality. Education, in general, and working experiences in an OECD country, in particular, was considered as HC indicators. The sample consists of returnees from the Middle East countries, other developing countries and OECD countries. It is rational to assume that returnees from OECD countries tend to be temporary returnees than the returnees from other countries. Moreover, SF remains the same as in Equation (4.8). The *ent* variable is a dummy variable, which takes one if the RSM is an entrepreneur at the time of the survey in 2013 or zero otherwise. Entrepreneurs are less likely to return permanently compared to employees; therefore, I expect a negative sign for the *ent* variable.

However, Model 3 does not capture the timing of returning. Some scholars argued that probability of returning declines with the overseas duration. Therefore, I analyze the relationship between probability of returning permanently and durations of overseas stay of

RSEs and REs, separately. For this purpose, I employed Kaplan-Meier survival estimate, which is a non-parametric application with minimum assumptions on the distribution of the hazard rate. The findings can be used to analyze whether entrepreneurs or skilled migrants are more likely to return permanently.

4.4.4 Hypothesis 3

In today's globalized and connected world, outsourcing of services from the North to the South has created business opportunities for the countries in the South (Blinder, 2006). Therefore, REs, who have exposed to the market domain and the technology domain in advanced countries, have been a competitive advantage to reap the benefits in the knowledge-based economy. Some scholars argue that REs underperform than their domestic counterparts due to institutional factors, lack of local social network and mismatches between the new venture and the institutional environment in the home country (Chen, 2008; Obukhova et al., 2012). Knowledge mismatch no longer exists in a globalized economy. However, as some scholars argued, social capital is a significant factor to thrive in the domestic market (Vanhonacker et al., 2005). These factors do influence the success of the venture if the market orientation is domestic. Entrepreneurs need to have sound local networks and need to be aware of the institutional environment in order to succeed in the local market. Moreover, if the domestic market is not matured enough, the innovative ideas brought back by REs might not be successful in the local market. However, none of these barriers would arise if the target market is advanced countries. In such a situation, human, physical and social capital or transnational capital they accrued during their overseas stay play a significant role (Saxenian & Hsu, 2001; Saxenian, 2002, 2006; Vanhonacker et al., 2005). Furthermore, exports barriers can be overcome by engaging with the diaspora. Interestingly, REs have a higher probability of accessing the diaspora for business leads, compared to local entrepreneurs, who do not have such exposure (Nanda & Khanna, 2010). Therefore, it further confirms the comparative advantage of REs to access the foreign market. In line with the arguments above, I assume

that REs, who are endowed with the transnational capital, should perform better in terms of exporting their services than local entrepreneurs. More precisely,

H 3.1: Presence of a returned entrepreneur enhances the export performances of knowledge services firms.

H 3.2: A higher ratio of REs in the management board enhances the export performances of knowledge services firms.

H 3.3: Transnational capital of the returned CEO helps to enhance the export performances of knowledge services firms.

Several regression models were developed to test the hypotheses above. Accordingly, the models analyze the determinants of export performances of knowledge services firms employing firm-level data of the survey of knowledge services firms. As I have explained in Subsection 4.3.2.2, some of the firms were reluctant to disclose the firm revenue in the year ended by March 2013. However, I collected data on export market intensity (percentage of sales generated from exports), export client intensity (percentage of foreign clients in the total client base), year of starting exports, and growth prospect of the firms in the exports market. Based on the above information, I analyzed export performance of the firms using four indicators, namely, (i) export market intensity, (ii) export client intensity, (iii) exporter from the beginning and (iv) exporter status (a dummy variable that takes one if total sales are generated through exports, zero otherwise).

As a way to test the third hypothesis of the study, three specifications were considered.

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.13)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.14)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.15)$$

The framework proposed by Sousa et al. (2008) considered the international experience of managers as a key determinant. However, it does not necessarily refer to REs. In the present

analysis, equations (4.13) and (4.14) capture the impact of having a returned entrepreneur and the ratio of REs in the management board on the dependent variable, respectively. The variable *return_ent* (presence of a returned entrepreneur) in Equation (4.13) is a dummy variable, which takes one, if the firm has at least one returned entrepreneur or zero otherwise, whereas the variable *return_ratio* in Equation (4.14) represents the ratio of REs in the management board.

However, to better understand what characteristics of the REs that significantly influences on the Y_i , Equation (4.15) specified with the characteristics of the CEO of the firm. Therefore, instead of *return_ent* and *return_ratio* in equations (4.13) and (4.14), Equation (4.15) was replaced with *characteristics_CEO*, which includes three main characteristics of CEO, namely, age, gender and a dummy variable that represents the transnational capital of the CEO. Age and gender of the CEO were included as additional controlling variables. Moreover, the special dummy variable was created to capture the effect of overseas education and working experiences of the CEOs on the dependent variable. In the context of the KSI in Sri Lanka, some REs possessed only the working experiences in developed or other developing countries, in particular, in the Middle East countries (South-South skilled migrants). In the meantime, there were CEOs who returned to Sri Lanka immediately after completing their study abroad. Yet, the majority of the returned CEOs gained industry experiences after completing their higher studies in developed countries. Therefore, a dummy variable with four categories, namely, (i) CEO has studied abroad, (ii) CEO has worked abroad only, (iii) CEO has studied and worked abroad and (iv) CEO has not studied or worked abroad, were created. The dummy variable captures the accrued transnational capital of the returned entrepreneur-cum-CEOs. Vanhonacker et al. (2005) included the durations of staying overseas and several other variables to measure the transnational capital. However, most of those indicators could not be applied in the present study due to the presence of

multicollinearity among the variables. In the general specification, I test the significance of β_j coefficients in the equations to judge the validity of the hypotheses.

Other than that, equations (4.13), (4.14) and (4.15) remains same. In those equations, X_{hi} represents a set of explanatory and controlled variables that consist of firm-specific characteristics, product-specific characteristics and ownership-related features of the firms. Sousa, Martinez-Lopez and Coelho (2008) proposed a framework to classify the existing large volume of determinants of export performance. They identified more than 40 variables through their literature review, and this indicates the fragmented and diverse nature of the topic. However, among the determinants, firm size was identified as the most common determinant, followed by the product strategy of the firm. In addition, the firm age was identified as a significant determinant of export performance. The sample consists of fully-owned foreign subsidiaries and firms with foreign investors or business angels. Foreign firms and investors have a competitive advantage than the locals to access the foreign market. Therefore, I included two dummy variables, namely, “*MNCs*” and “*Presence of foreign entrepreneur*” to control the effects of fully-owned subsidiaries and presence of foreign investors and business angels. The dummy variable *MNCs* takes one if the firm is fully-owned foreign subsidiaries, and zero otherwise. Similarly, the dummy variable *Presence of foreign entrepreneur* takes one if a foreign investor is a member of the management board of a firm or zero otherwise.

In equations (4.13), (4.14) and (4.15) Y_i indicates export performance of the firms. As I explained at the beginning of Subsection 4.4.4, four export related variables were employed to measure the export performances of the knowledge services firms. I developed four separate models, i.e. Model 4, Model 5, Model 6 and Model 7, using four export performance indicators as dependent variables. Moreover, in all the models, the same set of explanatory variables were applied to assess the export performances.

Model 4: In this model, I considered variable (i) export market intensity as the dependent variable Y_i in equations (4.13), (4.14) and (4.15). Export market intensity is a variable with censored outcomes as the sample consists of firm with zero export earnings and hundred percent export earnings. As I have explained earlier, usual OLS does not produce consistent estimates of the population parameters if the dependent variable has censored outcomes. Therefore, following the suggestion in the literature (Wooldridge, 2010), I applied two-limit Tobit specification to estimate the determinants of Model 4. Accordingly, I developed three Tobit models as follows:

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.16)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.17)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.18)$$

Where, Y_i is the export market intensity and X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.16), the impact of the presence of a returned entrepreneur (*return_ent*) on export market intensity was analyzed. The impact of *return_ratio* and *characteristics_CEO* variables on export market intensity was analyzed in equations (4.17), (4.18), respectively.

Model 5: Export market intensity is subjective to frequent fluctuations and also can be affected by a single large-scale order that might or might not be regular. However, the client base is less volatile and can be considered as a more robust estimate of the export performances. Therefore, in Model 5, variable (ii) export client intensity was considered as the dependent variable, Y_i , in equations (4.13), (4.14) and (4.15). Similar to Model 4, export client intensity is also a censored variable as the sample consists of firms with zero foreign clients and hundred percent foreign clients. I applied two-limit Tobit specification to estimate the determinants of export client intensity due to the same issues discussed under Model 4. Accordingly, I developed three Tobit models as follows:

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.19)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.20)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.21)$$

Where, Y_i is the export client intensity and X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.19), the impact of the presence of a returned entrepreneur (*return_ent*) on export client intensity was analyzed. The impact of *return_ratio* and *characteristics_CEO* variables on export client intensity was analyzed in equations (4.20), (4.21), respectively.

Model 6: Exporting is the first step towards the internationalization of the business, and the process of internationalization is in favor of large-scale MNCs (Prashantham, 2011). However, there is evidence of mini-MNCs³⁵ that have emerged within the KSI in Sri Lanka. Some firms have started as exporting entities from the day of its incorporation whereas others have spent several years in the local market before gaining access to a foreign market. Therefore, in Model 6, I considered variable (iii) an exporter from the beginning as the dependent variable Y_i , in equations (4.13), (4.14) and (4.15). This is a dummy variable, which takes one if the firm started as an exporting firm “global startup,” or zero otherwise. Therefore, probit estimation was applied as OLS is not suitable to estimate models with discrete dependent variables. Accordingly, I developed three probit models as follows:

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.22)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.23)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.24)$$

³⁵ Mini-MNCs are the small and medium size enterprises that exhibit the characteristics of MNCs such as presence in more than one country, geographically distributed production networks, and globally distributed employees.

Where, Y_i is a dummy variable, which takes one if the firm started as an exporting firm or zero otherwise. And, X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.22), the impact of the presence of a returned entrepreneur (*return_ent*) on starting as an exporting firm was analyzed. The impact of *return_ratio*, and *characteristics_CEO* variables on starting as an exporting firm was analyzed in equations (4.23), (4.24), respectively.

Model 7: In Model 7, variable (iv) exporter status was considered as Y_i in equations (4.13), (4.14) and (4.15). This is another aspect of export performance. While exporting is a challenge for many firms in developing countries like Sri Lanka, few firms in the sample fully caters to the export market. Therefore, it is interesting see whether REs have any advantage over it. For the same reason I mentioned in explaining Model 6 above, three probit models was applied.

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.25)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.26)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.27)$$

Where, Y_i is a dummy variable, which takes one if a firm fully caters to the foreign market and, zero otherwise. And, X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.25), the impact of the presence of a returned entrepreneur (*return_ent*) on exporter status was analyzed. The impact of *return_ratio*, and *characteristics_CEO* variables on exporter status was analyzed in equations (4.26), (4.27), respectively.

4.4.5 Hypothesis 4

The problem of capital market imperfection is more severe within the KSI due to asymmetric information and lack of tangible collaterals to secure external funds (Carpenter & Petersen, 2002). In developed countries, innovative financial instruments solve the problem of market imperfection such as venture capital financing and business angels in the context of the KSI. Although such innovative financial instruments are not available in developing

countries, REs, who are exposed to such institutions can easily access to venture capital financing and business angels in advanced countries. In addition, these REs participate in establishing such institutions, such as venture capital financing, in the developing country (Saxenian & Sabel, 2008). Therefore, as they experienced new ways of business financing in developed countries, REs are not bounded by the capital market imperfections in the developing country. On the other hand, foreign investors evaluate the competencies of the entrepreneur in addition to the profitability of the firm and marketability of the firm's products or services. REs, therefore, are in a favorable situation than local entrepreneurs as some of them might have proven track records in the international business. Moreover, REs have a higher probability of raising foreign funds through the diaspora due to their social networks (Nanda & Khanna, 2010). Therefore, I developed the fourth hypothesis as follows:

H 4.1: Presence of a returned entrepreneur increases the probability of accessing foreign capital for financial needs

H 4.2: A higher ratio of REs in the management board increases the probability of accessing foreign capital for financial needs

H 4.3: Transnational capital of the returned CEO increases the probability of accessing foreign capital

Two dependent variables: (i) access to seed capital from foreign sources, and (ii) access to foreign capital either for seed capital or business expansions, were considered. Variables such as firm age and firm size are included in similar research to analyze the determinants of credit access (for instance, Beck & Demirguc-Kunt, 2006; Akoten et al., 2006, Nichter & Goldmark, 2009). In order to test hypotheses H 4.1, H 4.2 and H 4.3, equations (4.13), (4.14) and (4.15) can be extended with little modifications. The significance of β_j in the three equations were tested. If β_j has a positive and significant effect on Y_i , the hypothesis fails to be rejected.

Model 8: (i) Access to seed capital from foreign sources was considered as Y_i in equations (4.13), (4.14) and (4.15). The dummy variable takes one if a firm has risen seed capital from

foreign sources, or zero otherwise. If the dependent variable has censored outcomes, the usual OLS does not produce consistent estimates of the population parameters (Wooldridge, 2010, 524). Therefore, three probit models were employed as follows:

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.28)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.29)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.30)$$

Where, Y_i is a dummy variable, which takes one if a firm has risen seed capital from foreign sources, or zero otherwise. And, X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.28), the impact of the presence of a returned entrepreneur (*return_ent*) on raising seeds capital from foreign sources was analyzed. The impact of *return_ratio*, and *characteristics_CEO* variables on raising seeds capital from foreign sources was analyzed in equations (4.29), (4.30), respectively.

Model 9: (ii) Access to foreign capital either for seed capital or business expansions was considered as Y_i in the general specifications. Most of the firms under study mentioned that they earned sufficient profits to be used for reinvestment in the business; hence, they did not raise external funds either from local or foreign sources after raising the seed capital.

Accordingly, three probit models were developed as follows:

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ent}_i + u_i \quad (4.31)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{return_ratio}_i + u_i \quad (4.32)$$

$$Y_i = \sum_{h=1}^k \beta_h X_{hi} + \beta_j \text{characteristics_CEO}_i + u_i \quad (4.33)$$

Where, Y_i is a dummy variable, which takes one if the firm raises seed capital or capital for business expiation from foreign sources, or zero otherwise. And, X_{hi} remains same as in equations (4.13), (4.14) and (4.15). In Equation (4.31), the impact of the presence of a returned entrepreneur (*return_ent*) on raising capital from foreign sources was analyzed. The

impact of *return_ratio*, and *characteristics_CEO* variables on raising capital from foreign sources was analyzed in equations (4.32), (4.33), respectively.

4.4.6 Hypothesis 5

REs transfer institutional know-how from the technological hubs in developed economies to the nodes in the developing economies. This may be in the form of venture capital finance, merit-based promotions, transparent corporate governance, teamwork culture and minimal hierarchy in the organizational structure (Saxenian, 2007). Therefore, RE who were exposed to such institutions may have introduced them into their business. In contrast, traditionally, the Sri Lankan corporate sector had a formal structure characterized by seniority-based promotion and hierarchical organizations, which were established by the colonial rulers. Therefore, locally grown firms are likely to have a similar type of structure and human resource management methods in their firms. Thus, institutional environment in REs' firms and local firms may not be the same. More precisely,

H 5: REs' firms apply institutional know-how more often than local firms

I consider four characteristics as proxies of institutional know-how, namely, open door policy to handle employee grievances, flat organizational structure, teamwork culture and performance-based promotions. These institutional characteristics are commonly observed in the KSI in advanced countries such as the U.S.A. Cross-tabulation and Chi-square statistics have been employed to test the relationship between institutional know-how and the presence of a returned entrepreneur in a firm.

4.5 Chapter Summary

This chapter presented the research methodology applied to analyze the relationship between brain circulation and industry growth. This dissertation relies on the integrated research approach, which is a combination of both quantitative and qualitative methods. Two surveys; Survey of RSMs and Survey of Firms, were conducted.

Survey of RSMs aimed to collect quantitative data to analyze the determinants of returning decisions of the skilled migrants in the KSI in Sri Lanka. In total, 232 RSMs were found in randomly selected 56 firms. Structured questionnaires were distributed among 205 RSMs comprising 30 REs and 175 RSEs. In response, 131 completed questionnaires were collected. Similarly, the aim of the Survey of Firms was to collect quantitative data to analyze the effect of the presence of a returned entrepreneur in a firm on its performances. I collected firm-level data from randomly selected 61 firms of a total of 290 firms.

Two main types of qualitative data were employed. To explore the factors that influenced the returning decision of the entrepreneurs, 10 successful REs were interviewed. I employed purposive sampling using the snowballing technique to select the 10 success stories. In-depth interviews were conducted with the selected RE, or with representatives using semi-structured and open-ended questions. In addition, I selected two prominent firms founded by REs in the KSI in Sri Lanka as case studies to analyze the REs' advantage and its contribution to the business expansions and growth of the KSI in Sri Lanka. The two case studies represent two distinctive stages of the industry growth of the KSI in Sri Lanka.

This chapter presented five hypotheses and nine econometrics models to analyze the relationship between brain circulation and industry growth. Hypothesis 1 assumes that factors determine the returning decision of an entrepreneur should be different from that of a skilled employee. The REs and RSEs may respond to the industry growth differently. I developed Model 1 and Model 2 to test this hypothesis. Model 1 captures whether industry growth is a significant factor that motivates employees to make the returning decision or not. Model 2 captures the probability of a returnee becoming an entrepreneur. The second hypothesis looked into the returning decision of the respondents; whether it is permanent or temporal. Model 3 was developed to test the second hypothesis.

Based on the methods presented in this chapter, Chapter Five explores the factors that promoted brain circulation in the KSI of Sri Lanka, particularly focusing on how the KSI's

growth, which is a meso-level factor, has influenced the returning decision of the skilled migrants. Hypotheses 1 and 2 is tested in Chapter 5 to establish the relationship between industry growth and brain circulation using the survey of RSMs. The same is illustrated by the solid arrow from industry growth to brain circulation on the right side of the analytical framework presented in Figure 2.1 in Sub-section 2.7. Further, success stories of selected REs are introduced to explain the findings.

Hypothesis 3 assume that REs, who are endowed with transnational capital, should perform better in terms of exporting their services than local entrepreneurs. Four variables, namely, (i) export market intensity, (ii) export client intensity, (iii) exporter from the beginning and (iv) exporter status, were identified to measure the export performances of firms. Four models (Model 5 to Model 7) were developed to analyze the determinants of each dependent variable.

The fourth hypothesis considered whether the REs have a higher probability to access foreign sources for the financial needs of firms using two dependent variables, i.e. (i) access to seed capital from foreign sources, and (ii) access to foreign capital either for seed capital or business expansions. I developed Model 8 and Model 9 to analyze these two variables.

Hypothesis 5 considers the use of institutional know-how by REs and local firms, using four proxies of institutional know-how, namely, open door policy to handle employee grievances, flat organizational structure, teamwork culture and performance-based promotions.

Chapter Six of this dissertation explores the factors that have contributed to the business expansions and rapid growth of the KSI in Sri Lanka. First, I employ two case studies of firms founded by REs to analyze the contribution made by these REs to expand the business activities and the KSI in Sri Lanka. Then, hypotheses three to five is tested in Chapter Six using the firm-level data of the survey of knowledge services firms. This is illustrated by the

solid arrow from brain circulation to industry growth on the left side of the analytical framework presented in Figure 2.1 in Sub-section 2.7.

CHAPTER 5: Determinants and Temporary Nature of Brain Circulation and Transnational Capital of the Returnees

5.1 Introduction

This chapter examines the factors that have motivated brain circulation within the KSI in Sri Lanka and further analyzes the temporary nature of brain circulation and transnational capital of the returnees. Entrepreneurs and skilled employees respond differently to market signals. For this reason, it is necessary to distinguish entrepreneurs and skilled employees when analyzing the determinants of brain circulation and other aspects. However, as highlighted in Chapter 2, the literature on brain circulation has produced mixed findings as authors have commonly referred to both entrepreneurs and skilled employees by neglecting the differences of the two groups. Therefore, this chapter highlights the differences between RSEs and REs in terms of the factors that have motivated their return decision, temporary nature of brain circulation and transnational capital of the returnees throughout the analyses. In particular, hypotheses 1 and 2 presented in Chapter Four will be tested in subsections of this chapter.

The rest of this chapter is organized as follows: Section 5.2 provides a brief description of the background data of the respondents. Determinants of brain circulation will be discussed in Section 5.3 using the push-pull frameworks whereas micro, meso and macro determinants will be analyzed in Section 5.4. It shows that pull factors such as growth of the KSI have significantly contributed to the current flow of brain circulation in the KSI in Sri Lanka. Importantly, industry-level determinants are decisive. Section 5.5 assesses whether the returnees are permanent returnees or temporary returnees. Moreover, the transnational capital of the returnees is analyzed in Section 5.6 using the duration of overseas stay, foreign education, working experiences abroad and networking. The role played by the government in

promoting return migration remains passive. Section 5.7 will briefly discuss the role of government in the context of Sri Lanka followed by chapter summary in Section 5.8.

5.2 Background of the Returnees

Background details of the RSMs together with comparative figures for RSEs and RE are presented in Table 5.1. Column I presents the background information and the sub-categories. For instance, *Age* is a background information and three subcategories of *Age* are “less than 35,” “35 to 44,” and “45 and over.” Other background information, namely, *Civic Status*, *Gender*, *Nationality*, *Ethnicity*, *Education and Purpose of migration* in Column I should be understood in the same way. Numbers in Column II indicate the number of REs in each subcategory. Accordingly, there are five REs in “less than 35” subcategory, eight in “35 to 44” subcategory and 9 in “45 or above” subcategory. The numbers in Column III show the number of RSEs in each subcategory. Accordingly, there are 65 RSEs in “less than 35” subcategory, 30 in “35 to 44” subcategory and 9 in “45 or above” subcategory. Column IV shows subcategory wise summation of Column II and Column III. Accordingly, there are 70 RSMs in “less than 35” subcategory, which is the summation of numbers in Columns II and III for the same subcategory. Similarly, RSMs in “35 to 44” and “45 or above” subcategories were, 38 and 18, respectively. All the other background information and subcategories in Table 5.1 should be understood in a similar manner.

Table 5.1 shows that 70 (56 percent) out of the total 126 respondents are less than 35 years old, and among them 65 respondents (91 percent) are RSEs. Most of them have returned after higher education as the fresh graduates with four years of overseas working experiences, on average. Fifty percent of RSMs in the age subcategory “45 and over” became entrepreneurs. Moreover, nine of 22 REs were in the age subcategory “45 and over.” It indicates that relatively senior returnees have become entrepreneurs in the KSI in Sri Lanka.

Table 5.1: Background Details of the REs, RSEs and RSMs

Description (I)	Number of REs (n=22) (II)	Number of RSEs (n=104) (III)	Number of RSMs (n=126) (IV)*
<u>Age</u>			
Less than 35	05	65	70
35 to 44	08	30	38
45 and over	09	09	18
<u>Civic Status</u>			
Unmarried	02	41	43
Married	19	62	81
Other	01	01	02
<u>Gender</u>			
Male	19	85	104
Female	03	12	19
<u>Nationality</u>			
Sri Lankan	09	96	105
Nonresident Sri Lankan	03	01	04
Dual Citizen	10	07	17
<u>Ethnicity</u>			
Sinhalese	17	91	108
Other	05	13	18
<u>Education</u>			
Diploma/Professional Qualification	02	14	16
Bachelor's degree	08	50	58
Master's degree	07	38	45
Doctorate	05	01	06
<u>Purpose of initial migration</u>			
Higher education	16	49	65
Employment	01	44	45
Permanent residency	03	05	08
Family reunion	02	06	08

Note: *Summation of Column II and Column III.

Source: Author's survey data (2013).

Many returnees are married (83 out of 126) and returned together with their families. If the returning decision is temporal, the skilled migrants will not return with their families. Therefore, this implies a permanent returning plan of the respondents. Of the total, 104

respondents (85 percent) are male, which indicates little sampling bias but do reflect the persisting gender bias within the industry.³⁶ This trend is not different for REs and RSEs.

The striking figure is the share of non-residing Sri Lankans and dual citizens in Column II. Some 13 out of 22 REs (59 percent) are either non-residing Sri Lankans or dual citizens. In other words, 23 RSMs in the sample possess either foreign citizenship or dual citizenship, and most of them, 62 percent, have started their own businesses. Some of the foreign nationality holders emphasized their interest in holding the status of dual citizenship, but strict controls by the Sri Lankan government over the procedure to grant dual citizenship from 2011 to 2015 made it difficult to acquire it.

The large share of Sinhalese in the sample, 108 out of 122 (85 percent), reflects little sampling bias. However, the ethnic Sinhalese accounts for nearly 75 percent of the total population of Sri Lanka. Five REs were from minority groups and the rest (17 REs) were Sinhalese.

Reflecting the general trend of student migration in Sri Lanka, 65 respondents (52 percent) have migrated for higher education, while 44 have migrated for employment. Until recently, most of these migrants did not return to Sri Lanka after completing their higher studies or at the end of employment contracts in developed countries. However, this trend has changed, at least within the KSI, and most of the skilled migrants are now returning to capitalize growing employment and entrepreneurial opportunities in the industry. Importantly, some permanent type migrants, which is 16 respondents (12 percent), have also returned. These permanent migrants were the people who had left the country to accept permanent residency in a host country or had united with their families abroad.

Nearly 110 respondents (87 percent) possessed at least bachelor's degrees, and the rest earned professional or diploma degrees. It should be noted that within some subfields of the

³⁶ According to the secondary data sources, more than 70 percent of the total employees in the industry are male (SLASSCOM, 2014)

KSI, for instance, in accountancy and financial services, professional qualifications have a higher recognition than the bachelor's degrees. Meanwhile, most of the respondents possess both professional and academic qualifications. Moreover, 51 respondents (40 percent) hold postgraduate degrees, including about six doctorates holders.

In addition to the background data presented in Table 5.1, the survey of RSMs further identified the following background information on the respondents. The average overseas working experience is about four years for all the respondents, and it is five years when no-experience category is excluded. The technical knowledge, in particular, in information technology services, may become obsolete because technology becomes updated very rapidly due to the shorter production cycle. Therefore, if someone has four to five years of experiences, on average, on the latest technology, that is considered significant years of industry experiences.

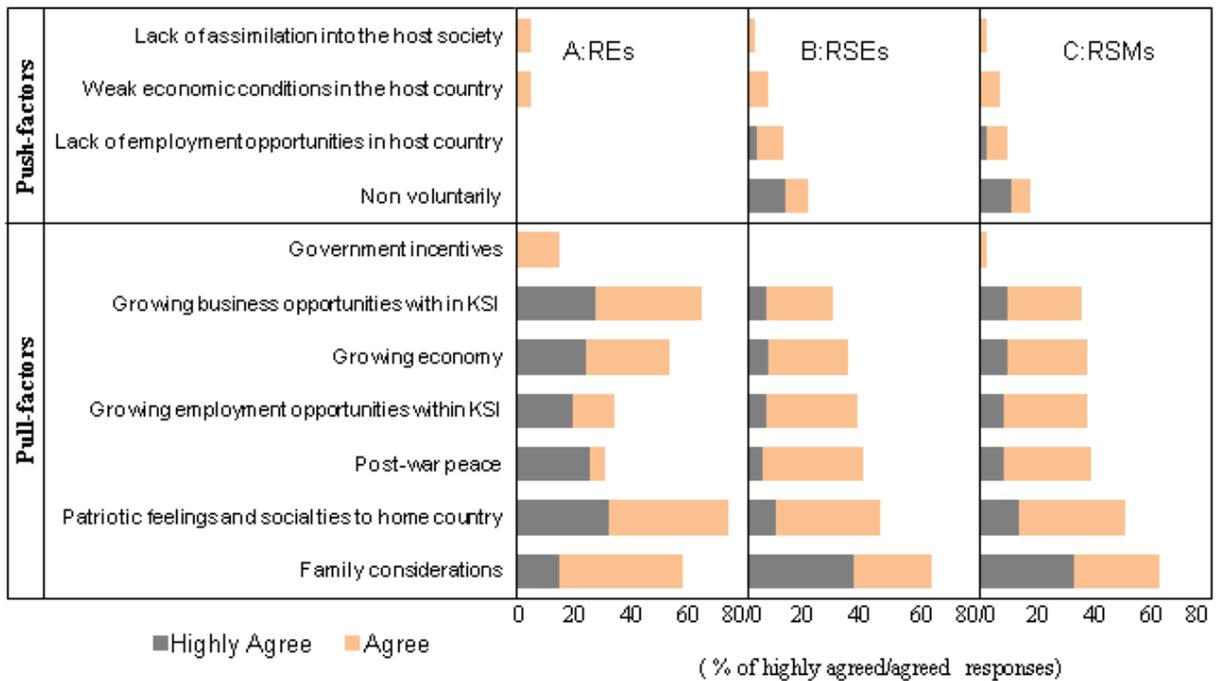
Although many scholars agree that pull factors outweigh in the process of brain drain, lack of opportunities for the educated and stagnated industrial growth in home countries are significant determinants of migration of skilled people. If knowledge-based industries are growing in home countries, such industries would create employment opportunities and career progress for the educated. If the industries are stagnated and thereby do not produce enough employment opportunities, skilled migrants will not return. The positive thing here in the KSI is the returning of highly educated and experienced skilled migrants in recent years. Section 5.3 analyzes the push and pull factors that have driven the brain circulation in the KSI.

5.3 Push Factors versus Pull Factors

Main determinants of brain circulation can be discussed in broader terms as pull and push factors, as illustrated in Figure 2.1, in Chapter 2. Thus, I considered both push and pull factors in order to understand the determinants of brain circulation in the context of the KSI in Sri Lanka. The considered push factors have highlighted negative aspects of the host country, namely, weak economic conditions, lack of employment opportunities, and assimilation

problems of the migrants. Further, I classified non-voluntarily returning as a push factor. The seven pull factors represent social, cultural, political and economic aspects in Sri Lanka that pulled back these returnees.

Figure 5.1: Influence of Push-Factors and Pull-Factors on Brain Circulation



Note: The horizontal axis indicates the percentage of positive responses for each question
 Source: Author's survey data (2013).

The 11 factors and the influence of each factor on return decision of skilled migrants are summarized in Figure 5.1. The figure shows the percentage of respondents agreed or fully agreed on pull factors and push factors. The three panels, A, B and C, exhibit the responses of REs, RSEs and RSMs, respectively. Figure 5.1 clearly indicates that the pull factors have driven the current flow of brain circulation in the KSI in Sri Lanka. Yet, to a much lesser extent, push factors have influenced the return decisions of skilled employees. The majority of RSMs disagreed that they had returned because of negative aspects of the host country. However, 20 RSEs (20 percent) have agreed that their return decisions were non-voluntary. As I explained in Chapter Four, most of the skilled migrants in Sri Lanka started their overseas experience as student migrants for tertiary education. However, visa restrictions in

countries such as the U.K. and language barriers in countries such as Japan have made it difficult for them to extend this visa after their graduation. This has caused the non-voluntary returning of skilled people to Sri Lanka.

Very few respondents have had assimilation issues into the host country conditions. For instance, one respondent³⁷ stated that he did not have a social life as he experienced in Sri Lanka during his overseas stay. Although he had an affluent life with a well-paid job in an IT company and materialistic life, he has failed to adjust to the culture in the host country. However, returnees with such assimilation issues are rare among the sample respondents.

Among the pull factors, most agreed ones were socio-cultural determinants and post-war peace. Fifty out of 126 respondents (40 percent) agreed the fact that economic growth and industry growth influenced their return decision. However, the pattern of reasoning drastically differed for entrepreneurs and skilled employees. The most agreed motivational factor for RSEs were family considerations. However, those for the REs were the patriotic feelings and social ties to the home country. Fourteen REs (64 percent) agreed that growing business opportunities within the KSI motivated them to return to Sri Lanka. Additionally, economic growth, growing employment opportunities within the industry and government incentives to run businesses in Sri Lanka influenced the return decision.

The impact of motivational factors on return decision is recorded in a four-point Likert scale; highly agree, agree, disagree and highly disagree. And this information is separately available for the two groups; REs and RSEs. Therefore, the relationship between the agreement on each motivational factor and the two groups were tested using the Chi-square test. If the expected value of a cell is less than five, the Chi2 statistics does not produce reliable estimates of the relationship. The problem can be overcome by using the Fisher's exact test.

³⁷ ExEEMFF 1, a returned entrepreneur from Australia.

Table 5.2: Association between Motivational Factors and the Two Groups (REs & RSEs)

No	Push factors (1~4) and pull factors (5~11)	Pearson Chi2 Test		Fisher's Exact Test
		Chi2 statistic	P value	P value
01	Non-voluntary	7.404	0.06	0.07
02	Lack of assimilation into society of host country	2.852	0.24	0.17
03	Weak economic conditions in the host country	1.237	0.54	0.65
04	Lack of employment opportunities in host country	2.709	0.44	0.63
05	Growing employment opportunities within the KSI	5.886	0.12	0.12
06	Growing business opportunities within the KSI	13.247	0.00*	0.01*
07	Growing economy	6.533	0.09	0.12
08	Post-war peace	13.818	0.00*	0.00*
09	Patriotic feeling and social ties to home country	10.209	0.02*	0.02*
10	Family considerations	7.045	0.07	0.07
11	Government incentives	15.596	0.00*	0.01*

Note: Status of returnee is a binary take one if entrepreneur, or zero if skilled employee. * indicates the Alpha level= ≤ 0.05

Source: Author's survey data (2013).

Therefore, both test statistics for each of the 11 motivational factors are presented in Table 5.2. For instance, the impact of non-voluntary factors on retuning decision is different for REs and RSEs. Row number 1 in Table 5.2 presents the significance of this relationship.

Accordingly, both Person Chi2 test and Fisher's Exact test results suggest that there is no significant different between REs and RSEs in terms of their agreement on the impact of non-voluntary factors on return decisions.

Similarly, none of the push factors significantly differentiated the return decisions of entrepreneurs and skilled employees. Among the pull factors, the agreement on the impact of four motivational factors, namely, growing business opportunities (Raw No 06), post-war peace (Row No 08), patriotic feeling and social ties (Row No 09) and government incentives (Row No 11) on return decision were significantly different for the two groups of returnees. For instance, compared to RSMs, a significant number of REs agreed that growing business opportunities motivated them to return. Therefore, the four factors identified above emerge as the most significant factors that differentiate return decisions of entrepreneurs and skilled employees.

Drawing on the discussion above, it is conclusive that pull factors drove the brain circulation in Sri Lanka. However, the push-pull framework is not sufficient to capture what pull factors were decisive in the context of the KSI. Therefore, I further analyze the determinants of brain circulation at micro, meso and macro levels to identify the most influential pull factors that motivated the current flow of brain circulation in the KSI.

5.4 Micro, Meso and Macro-level Determinants

Pull factors or the favorable conditions in the home country can be analyzed at three levels as indicated in Figure 2.1 in Chapter Two. Therefore, Subsection 5.4.1 presents the micro-level determinants of brain circulation, followed by a detailed analysis of meso-level determinants in Subsection 5.4.2. Macro-level determinants are discussed in Subsection 5.4.3.

5.4.1 Micro-level determinants

This subsection considers social and cultural factors as the micro determinants. Many skilled migrants have mentioned that their return decisions were influenced by non-economic factors such as family reasons and cultural issues. Therefore, in order to consider such concerns, at first, I review a case of one returned entrepreneur, SG1.

SG1 is a returnee from the U.S.A. and he is a Ph.D. holder in computer sciences from Purdue University. He had worked for IBM Research since 1997 and he was an employee of IBM Research even when he returned to Sri Lanka in 2001. He continued to work for the IBM Research while remotely located in Sri Lanka until he started WSO2 in 2005.

Cultural and social factors have driven the return decision of the returned entrepreneur SG1. In an interview with Abeyasekara (2011), he explicitly mentioned the concern about the lack of identity among his children born to Asian parents in the U.S.A. His first child was at school age in 2001 when he returned to Sri Lanka. If his children grow up in a foreign culture, they could easily lose their cultural and social values. Moreover, he mentioned his intention to contribute to the young people in Sri Lanka as follows:

...this is home and there's nothing like home (for me). I love the fact that I can have some small impact on young people who can help Sri Lanka move forward in its journey. I love the fact that I am not second class in any way in my home country. I love the fact that my kids are growing up here with roots in their home country, where they end up as adults is their decision, not mine. But at least they have a firm footing here as their home (SG1, 2011).³⁸

His patriotic feeling toward Sri Lanka also is reflected by his post-returning activities. He is actively involved with the academia in Sri Lanka, in particular, having a close connection with the Department of Computer Science and Engineering at the University of Moratuwa. He worked as a visiting lecturer (2002-2009) and as an industry representative at the Faculty of Engineering of the same university. This should not be considered as a way of generating extra income as the payments for visiting lecturers were very low (LKR 500 or less than US\$ 4 per hour) in those days. Additionally, he was involved as a guest lecturer in global startup program of the Massachusetts Institute of Technology and Moratuwa University at the inaugural session in 2011.

As the REs helped to upgrade the ICT industry in Taiwan, SG1 promoted “Open Source Development (OSD)” among young Sri Lankan software engineers through the Lanka Software Foundation (LSF). The LSF was co-founded by SG1 while he worked for IBM Research remotely from Sri Lanka. The OSD was new to Sri Lankan software developers, and the initiative has contributed to the upgrading of technical know-how of employees in the KSI of Sri Lanka. Moreover, he has been actively involved in promoting brain circulation within the industry through his “work in Sri Lanka” initiative. Therefore, his desire to contribute to the development of Sri Lanka and matters related to his children motivated SG1 to return without incurring any economic cost.

³⁸ Extracted from a blog post of SG1 titled “10 years since returning to Sri Lanka” (2011).

Similar to the returnee SG1, most of the returnees, 88 of the sample of 126 respondents, have considered these social and cultural factors when they made their return decisions. In addition to the micro factors, the impact of meso-level factors on the return decision is considered in the next subsection.

5.4.2 Meso-level determinants

In this subsection, I focus on the industry related determinants that influence on the brain circulation with special reference to the KSI. Subsection 5.4.2.1 analyzes the impact of wage premium on return decisions. The impact of the growth of the KSI on return decisions is analyzed in Subsection 5.4.2.2. In Subsection 5.4.2.3, the probability of becoming an entrepreneur and the industry specific motivational factor is analyzed.

5.4.2.1 Wage premium

The survey of RSMs included a set of questions related to salary particulars of the returnees. However, as mentioned in Chapter Four, some respondents were reluctant to disclose salary related details. Nonetheless, 73 of the 104 RSEs who participated in the survey generously disclosed their salary details, including their current salary. None of the REs disclosed their remunerations; hence, the reported salary particulars should not be overestimated. Accordingly, the mean and median salary per month was US\$ 1,177 (LKR 155,255) and US\$ 872 (LKR 115,000), respectively.³⁹ The mean salary was almost similar to a monthly salary of a senior professor from a Sri Lankan national university as of September 2013. Moreover, GDP per capita (at current market prices) in Sri Lanka was US\$ 3,280 in 2013 (CBSL, 2013). Accordingly, in 2013, a returnee earned more than US\$ 10,000 per year, on average, compared to an average earning US\$ 3,280 of a Sri Lankan citizen. The amount is remarkable in a situation where more than 40 percent of the Sri Lankan population earn less

³⁹ I considered the official exchange rate (average of the selling and buying rate) reported by the Central Bank of Sri Lanka on September 30, 2013 to convert the Sri Lankan rupee values (LKR) into US dollar values. Accordingly, one US\$ was equivalent to 131.945 Sri Lanka rupees (CBSL, 2014).

than US\$ 2 per day. Therefore, it is obvious that the KSI has provided a wage premium to the employees compared to the other industries in the country.

Table 5.3: Average Monthly Salary and Salary Increment from 2012 to 2013 for RSEs

Occupational Positions	Average salary (monthly) in 2013			Average salary increment per-year		
	N*	LKR	US\$	n*	LKR	US\$
Director (Architect and Engineering)	4	412,500	3,126	3	42,202	320
Top Managers (Head of Sales and Senior Accountant)	6	409,000	3,100	6	50,779	385
Consultants	3	285,000	2,160	1	10,382	79
Directors (unclassified)	4	263,250	1,995	4	22,778	173
Development Lead/ Quality Assurances Lead	5	178,000	1,349	4	16,258	123
Project Managers	5	155,800	1,181	4	12,417	94
Database Engineers	3	146,667	1,112	3	46,500	352
System Engineers	3	138,333	1,048	3	5,583	42
Senior Software Engineers	8	114,263	866	7	9,966	76
Business Analysts	4	92,250	699	2	(5,688)	(43)
Software Engineers	3	68,333	518	2	(5,417)	(41)
Others	4	63,000	477	1	13,571	103
Project Coordinators	4	56,750	430	2	11,625	88
Engineers	6	55,917	424	3	3,000	23
Assistant Managers (Finance, HR, and Marketing)	9	47,222	358	8	(1,278)	(10)
Web Developer	2	35,000	265	1	1,800	14
Total	73	155,255	1177	54	16,457	125

Notes: In the calculation of average salary increment per year, 2013 observation are excluded as salary increments are not yet applicable. In year 2013, per capita GDP (at current market prices) in Sri Lanka was US\$ 3,280 (274 per month) (CBSL, 2014). N* refers to the number of respondents who disclosed their salaries in 2013 by occupation positions. Total number is 73. n* refers to the number of respondents who disclosed their salaries in 2012 and 2013 by occupation positions. Total number is 54.

Source: Author's survey data (2013).

Table 5.3 shows an average monthly salary of RSEs and average salary increment from 2012 to 2013 based on occupational positions of RSEs. Except Web Developers, monthly salaries of all the other occupational positions are higher than the per capita income of an average Sri Lankan. On the annual basis, the average salary has increased by 12 percent for

RSEs. Besides increasing wage levels, RSEs are moving for better opportunities within the industry. Although there is a sufficient supply of fresh graduates in the industry, employees with a few years of experience are in short supply. Therefore, RSEs are in a better position to capitalize those opportunities if they have a few years of foreign work experiences. This suggests that the industry has created employment opportunities for the returning skilled migrants other than a wage premium.

I compared between the last salary drew abroad before returning to Sri Lanka and the first salary received after returning to Sri Lanka. This comparison helps to identify the compensated salary by a returned skilled employee to accept an employment opportunity in Sri Lanka. All the 73 respondents who disclosed their salaries agreed that the last salary they drew before returning to Sri Lanka is higher than the first salary they received after returning to Sri Lanka. 34 RSMs disclosed their salary particular in details, enabling me to calculate the salary they had forgone when they accepted the employment in Sri Lanka. However, due to the time value of money, the calculation was limited to the year 2012. Accordingly, skilled employees who returned in 2012 (23 respondents) had forgone salary of more than US\$ 2,000 (LKR 274,000) per month to accept employment opportunity in Sri Lanka.

It is clear that the skilled returnees are aware that they cannot receive similar material benefits they enjoyed in advanced countries. The idea of the wage premium, hence, is a relative term. In the context of Sri Lanka, although returned skilled migrant had sacrificed around US\$ 2,000 per month, the average salary earned by a returned skilled employee was almost similar to that of a senior professor of a national university in Sri Lanka. Therefore, the findings suggest that brain circulation can be promoted if the returnees receive relatively higher salaries and even if they do not receive absolutely higher salaries.

5.4.2.2 Skilled migrants' response to the industry growth

This section employs Models 1 presented in Subsection 4.5.2 of Chapter Four to test the hypothesis H 1.1 and H 1.2. In particular, Model I captures the factors that influenced the

return decision of the skilled employees and entrepreneurs, particularly, the way they responded to the industry growth.

Table 5.4: Regression Results on the Determinants of Returning Before 2009

If returned before 2009=1, zero otherwise.	Probabilities of returning before 2009
<u>Controlling and explanatory variables</u>	
Age	-0.0044 (-0.322)
Age square	-0.0002 (-0.330)
Gender (male=1)	0.226* (1.646)
Ethnicity (minority=1)	0.487*** (2.918)
Civic status (unmarried=1)	-0.343*** (-3.022)
Nationality (Sri Lankan=1)	-0.0112 (-0.0735)
Non-degree holders (base category: Max. postgraduate degree)	0.297* (1.748)
Max. bachelor's degree (base category: Max. postgraduate degree)	0.186 (1.464)
Work experience abroad (yes=1)	-0.474*** (-3.179)
Having school-aged children at the time of returning (yes=1)	-0.0228 (-0.179)
Entrepreneur (entrepreneur=1 and employee=0)	0.558*** (3.194)
Observations	125
Pseudo R2	0.3124
Probability>chi2	0.0000
Hosmer and Lemeshow's goodness of fit test (with 10 groups)	0.7038

Note: Estimated results of Equation (4.8) is presented in the table. Robust z-statistics in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Source: Author's survey data (2013).

The year 2009 has a significant effect on the brain circulation as the post-2009 period shows a rapid increase in the number of returnees. Therefore, if the skilled migrant returned before 2009, the dummy dependent variable in Equation (4.8) takes one, and zero otherwise. The estimated results of (4.8) is presented in Table 5.4.

The estimated coefficients represent the marginal effects of independent variables on the probability of returning before 2009. More precisely, reported coefficients represent the changes in the probability of the dependent variable for a very small change in a continuous variable and discrete change, i.e. zero to one, of a dummy variable. The model is controlled for the demographic factors, and the robust standard errors were employed to determine the significant variables. Moreover, the model specification was tested using Hosmer and Lemeshow's goodness fit test.

Here, I focus on three important characteristics of the returnees. First, demographic factors of the respondents who returned before 2009 are significantly different from that of those who returned after 2009. The gender bias in the KSI is well-known. Although gender dimension is not the main focus of the study, positive and marginally significant coefficient of the gender variable suggests that male returnees have a higher probability to return before 2009.

As suggested by highly significant *ethnicity* variable, minority ethnic migrants have returned before 2009. This is reflected by positive and highly significant coefficient of the *ethnicity* variable in Table 5.4. The coefficient indicates that the probability of returning before 2009 is higher for ethnic minorities than the majority Sinhalese. In other words, post-war industry growth in the KSI has promoted Sinhalese returnees than other ethnic minorities. Civic status also has a significant impact on the probability of returning before 2009. However, it does not have a practical explanation as it was included as a control variable for demographic factors.

Second, human capital indicators provide strong evidence to claim that the KSI has benefited from brain circulation in recent years. Positive and significant coefficient of the

non-degree_holder variable indicates that returnees who possess professional and technical qualification (non-degree tertiary qualifications) have a higher probability to return before 2009, compared to the reference category of *Max._postgraduate_degree*. However, there is no difference in the probabilities of returning before 2009 between bachelor's degree holders and postgraduate degree holders, as witnessed by the insignificant coefficient of the *Max._bachelor's_degree* variable. The Sri Lankan education system up to the undergraduate level is well-established and good at producing high caliber graduates. However, many Sri Lankans still seek to go to advanced countries such as the U.K., the U.S.A. and Japan for postgraduate studies. Therefore, the returning of postgraduate degree holders after 2009 is a clear indication of the successful brain circulation as the returnees are highly educated migrants. In particular, master's and Ph.D. degree holders who studied in advanced countries have shown a growing interest in the KSI in Sri Lanka. Moreover, a significant flow of employees with foreign working experiences have returned since 2009. The negative and highly significant coefficient of the *working_experience_abroad* variable supports this claim.

Finally, the *entrepreneur* variable is highly significant and has a positive sign. This indicates that a significant number of employees have returned since 2009 as the industry growth was observable. The exact probability of returning before 2009 for REs and RSEs, which was evaluated at the mean values of the other controlling and explanatory variables, were 0.71 and 0.29 respectively. Therefore, based on this finding we fail to reject the hypothesis H 1.1 of this study (see Subsection 4.4.2 in Chapter 4). Accordingly, industry growth is identified as a significant factor that motivates employees to make the return decision.

On the other hand, a positive relationship between being an entrepreneur and returning before 2009 suggest that entrepreneurs returned when industry growth was not visible. Therefore, it is reasonable to argue that the entrepreneurs had returned before the industry took off in 2009. Based on this finding, the hypothesis H 1.2 is not rejected. More precisely,

the industry growth is not a significant factor that motivates entrepreneurs to make the return decision.

Therefore, estimated results of Model 1 confirm that the entrepreneurs are keen on the growing entrepreneurial opportunities that are easy to materialize at the early stage of the industry growth, which is before 2009 in the case of Sri Lanka.

5.4.2.3 How likely the returnee is an entrepreneur?

Model 2 (see Subsection 4.5.2) was used to test the hypotheses H 1.3 of the research. It estimates the probability of a returnee becoming an entrepreneur given his/her attributes and factors that motivated the return decisions of skilled migrants.

Table 5.2 in Section 5.3 revealed several motivational factors that are different between RES and RSEs. The factors were growing employment opportunities, growing business opportunities and peaceful environment and social factors (patriotic feeling and social ties). These MFs were considered as dummy variables in this model. The estimated coefficients are presented in Table 5.5, together with robust standard errors.

In order to highlight the effects of human capital attributes on entrepreneurship in the KSI, I consider two types of human capital indicators as explained in Model 2. In Table 5.5, estimated results of equations (4.9), (4.10) and (4.11) are presented in columns I, II and III, respectively. According to the column I, two demographic factors emerged as significant determinants of entrepreneurship within the KSI in Sri Lanka. There is a positive relationship between age of the returnee and the probability of becoming an entrepreneur as demonstrated by positive and highly significant coefficient of *age* in all the three columns I, II and III. Highly significant and negative coefficient of *age_square* across the three columns suggests that the probability of becoming an entrepreneur tends to decline after a threshold age level, which are 58, 44 and 44, respectively in columns I, II and III.

Table 5.5: Regression Results on the Determinants of Entrepreneurship

Dependent variable takes 1 if the returnee is an entrepreneur, and zero if an employee	I	II	III
<u>Controlling and explanatory variables</u>			
Age	0.014*** (3.993)	0.007** (2.216)	0.007** (2.007)
Age square	-0.0003** (-2.001)	-0.0004** (-2.134)	-0.0004** (-2.105)
Gender (male=1)	-0.002 (-0.047)	-0.064 (-0.842)	-0.071 (-0.946)
Nationality (Sri Lankan=1)	-0.212*** (-2.753)	-0.251** (-2.573)	-0.226** (-2.445)
Max. bachelor's degree (yes=1)	0.203* (1.698)		
Max. postgraduate degree (yes=1)	0.180 (1.370)		
Max. foreign bachelor's degree (yes=1)		0.169** (2.048)	0.160** (2.007)
Max. foreign postgraduate degree (yes=1)		0.166** (2.118)	0.156** (2.026)
Working experiences (total)	-0.015*** (-3.697)		
Working experience (abroad)		-0.0006 (-0.095)	
Working experience (OECD country)			0.002 (0.358)
Entrepreneurial activities abroad (yes=1)	0.141 (1.430)	0.227** (2.004)	0.210* (1.878)
Graduate parents (If father/mother has degree or above -qualifications=1)	0.101** (2.485)	0.082* (1.868)	0.077* (1.785)
Attended a popular school in a major city in Sri Lanka	-0.012 (-0.412)	-0.047 (-1.053)	-0.053 (-1.148)
Employment opportunities in the KSI (agreed=1)	-0.0203 (-0.729)	-0.091** (-2.339)	-0.093** (-2.387)
Business opportunities in the KSI (agreed=1)	0.184*** (3.011)	0.172** (2.321)	0.193** (2.331)
Peaceful environment in Sri Lanka (agreed=1)	-0.129*** (-4.176)	-0.110** (-2.423)	-0.116** (-2.430)
Patriotic feeling and social ties to home country -(agreed=1)	0.0215 (0.679)	0.005 (0.109)	0.004 (0.098)
Observations	125	125	125
Pseudo R2	0.58	0.52	0.52
Probability > chi2	0.0000	0.0000	0.0000
Hosmer & Lemeshow's goodness of fit test (10 groups)	0.99	0.85	0.60

Note: Estimated results of equations (4.9), (4.10) and (4.11) are presented in columns I, II and III, respectively.

Robust z-statistics in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Source: Author's survey data (2013).

Interestingly, *nationality* variable has become negative and significant across all columns in Table 5.5. The *nationality* is a dummy variable, which takes one if returnee has a Sri Lankan nationality or zero if the returnee has a foreign nationality or dual citizenship. Therefore, a negative sign indicates that the returnees, who possess dual citizenships or foreign nationality, are more likely to become entrepreneurs. Thus, the returning of the migrants who do not possess the Sri Lankan nationality have shown their interest in the growing investment opportunity in the home country. Therefore, results of regression analysis suggest that promoting entrepreneurship is an effective way to encourage the return decision of the skilled migrants who permanently left their home countries.

In Equation (4.9), I consider general human capital indicators to assess its impact on the entrepreneurship. However, general indicators fail to predict the outcomes correctly, as reflected by the negative sign of the variable *working_experiences_(total)* and insignificant coefficients of the variables *max_postgraduate_degree* and *entrepreneurial_activities_abroad*. In particular, negative and highly significant impact of working experience on the dependent variable is contradictory to findings in the literature and conventional wisdom. The industry is export oriented by nature as highlighted in Subsection 3.4.3, and both RSEs and REs are highly educated people. Therefore, general human capital indicators such as total years of experience, having a bachelor's or master's degree would not differentiate the entrepreneurship. Instead, accumulated transnational capital of the returnee in terms of the duration of overseas stay, foreign education, foreign working experiences, and networks with foreigners should create a definite advantage to become an entrepreneur in such export oriented and knowledge-based industries as the KSI.

In Equation (4.10), I considered foreign work experiences and foreign educational qualifications as the main components of transnational capital. Accordingly, education dummies and entrepreneurial activities abroad dummy have become highly significant and positive determinants of the entrepreneurship. More precisely, the probability of becoming an

entrepreneur is significantly higher for bachelor's or postgraduate degree holders than non-degree holders. Similarly, a returnee with some entrepreneurial experiences abroad has a higher probability to start a business upon their return. It is common to include the educational qualification of parents as human capital indicators. Thus, I include a dummy variable to capture the effect of father's or mother's education on entrepreneurial activities of the returnees. Accordingly, the returnee has a higher probability to become an entrepreneur if one of the parents possesses bachelor's degree or higher educational qualifications. Moreover, working experience dummy is not significant although the coefficient has the negative sign once the general indicators of human capital are replaced with the indicators for transnational capital. The coefficient of working experience has become positive in the Column III when working experience in an OECD country is considered, but still it is not significant. Therefore, the regression results in Column II seem to be the best model that explains the current data set. Therefore, what follows will focus on the coefficients in Column II in Table 5.5.

According to the survey data, the return decisions of entrepreneurs and employees were motivated by different factors. The coefficient of the *employment_opportunities* dummy has a significant and negative effect on the dependent variable. It suggests that if the return decision is motivated by the growing employment opportunities within the KSI, such kind of returnees have a lower probability to become an entrepreneur in the KSI. Similarly, those who are motivated by the peaceful environment of the country have a lower probability to become an entrepreneur. Negative and highly significant coefficient of the *peaceful_environment* variable supports this claim. In contrast, returnees who are motivated by the growing business opportunities in the KSI are more likely to become entrepreneurs as witnessed by the positive and highly significant coefficient of the *business_opportunities_in_the KSI* variable. Further, there is no significant difference between employees and entrepreneurs in their patriotic feelings and social ties to Sri Lanka. Therefore, it is clear that RSEs and REs respond

differently to the industry opportunities. If someone is looking for an employment opportunity, he/she is more concerned with growing employment opportunities and the state of peace of the country, whereas returnees who intend to become entrepreneurs are searching for business opportunities to start their own business. However, employment opportunities cannot be generated in an industry if it is not on its growth trajectory. On the other hand, early movers can capitalize the emerging business opportunities at the early phase of the industry growth. Nonetheless, such opportunities tend to diminish when an industry is in its growth trajectory. Results of Model 2 analysis also support the above claim.

5.4.3 Macro-level determinants

This section presents the analysis of macro-level determinants of brain circulation. Growing economy and peaceful environment are essential conditions to promote brain circulation. Therefore, first, I analyze how returnees responded to the economic growth in the host country and Sri Lanka, using success stories of REs. Second, I analyze the responses of returnees to the peace in Sri Lanka using the qualitative data.

5.4.3.1 GDP growth in Sri Lanka and in the host country

Table 5.6 presents qualitative information on ten success stories inquiring whether the REs were motivated by weakening economic conditions in the host country or the rapidly growing economy in Sri Lanka.

Table 5.6: Effects of GDP Growth in Sri Lanka and Host Country on Return decision of REs

REs*	Year of return (t)	Host country	GDP per capita growth in Sri Lanka			(c) ³ If [(a)-(b)]>0, Yes, otherwise, No	GDP per capita growth in host country			(f) ⁴ If [(d)-(e)]<0, Yes , otherwise, No
			(a) ¹ Growth in the year (t-1)	(b) ² average growth (t-1)~(t-5)	(a)-(b)		(d) ¹ Growth in the year (t-1)*	(e) ² average growth (t-1)~(t-5)	(d)-(e)	
SG3	2006	U.S.A.	6.24	4.01	2.23	Yes	3.08	2.41	0.67	No
SG1	2001	U.S.A.	6	5.04	0.96	Yes	4.17	4.35	(0.17)	Yes
EM2	1996	U.S.A.	5.5	5.40	0.10	Yes	3.79	2.54	1.25	No
EM1	1995	U.S.A.	5.6	5.58	0.02	Yes	2.55	2.40	0.15	No
EM4	1995	U.S.A.	5.6	5.58	0.02	Yes	2.55	2.40	0.15	No
EM3	1999	U.K.	4.7	5.20	(0.50)	No	3.57	3.98	(0.41)	Yes
ExEEMF2	2009	Australia	5.95	6.04	(0.47)	No	3.77	3.59	0.18	No
ExEEMF1	2000	Australia	4.3	4.94	(0.64)	No	4.95	4.27	0.68	No
ExEEMF3	2000	U.S.A.	4.3	4.94	(0.64)	No	4.87	4.02	0.85	No
SG2	2002	U.S.A.	-1.55	3.97	(5.52)	No	1.09	3.81	(2.72)	Yes

Notes: *The REs names are anonymous: Abbreviated as; Early Move (EM); Second Generation (SG); and Ex-Employee of Early Mover Firm (ExEEMF).

1. Economic growth in the preceding year before returning to Sri Lanka: if return in 2006, the economic growth rate in 2005

2. Average economic growth rate of five preceding years before returning to Sri Lanka: if return in 2006, average economic growth rate from 2001 to 2005

3. If preceding year growth in (a) is greater than the average growth in (b), the answer is yes: if return in 2006, economic growth rate in Sri Lanka in 2005 was greater than the average growth from 2001 to 2005. Therefore, the answer in Column (c) is yes.

4. If preceding year growth in (d) is less than the average growth in (e), the answer is yes: if return in 2006, economic growth rate in host country in 2005 was less than the average growth from 2001 to 2005. Therefore, the answer in Column (f) is no.

Source: Author's survey data (2013); World Bank (2013).

It should be noted that Sri Lanka had a stagnant economy in terms of GDP growth until 2010. The average economic growth rate from 1960 to 2009 was 4.67%, which is not remarkable for a developing country. I consider two points to decide whether economic growth drove the return decisions of REs. First, I calculated the average economic growth rate in Sri Lanka for the preceding five years before the return of entrepreneur to Sri Lanka. Second, I compared the calculated average growth rate in Column (b) with the GDP growth rate in Sri Lanka in the year before returning to Sri Lanka in Column (a). As a rule of thumb, if the observed GDP growth rate in the year before returning to Sri Lanka is less than the last five years average rate $[(a-b)>0]$, it cannot be concluded that return decision was motivated by remarkable economic growth in Sri Lanka (Column c).

Similarly, I compare the preceding five-year average growth rate in the host country and growth in the year-before-return to decide whether the return decision was driven by declining economic growth in the host country (columns d and e). If the GDP growth rate in the host country in the year before returning to Sri Lanka is significantly lower than the last five years average, it is reasonable to assume that the return decision was motivated by declining growth in the host country (Column f). The ten individuals presented in Table 5.6 are listed in the order of the growth differences in the columns (a)-(b).

First, I excluded last five respondents, namely, EM3, ExEEMF 2, ExEEMF 1, ExEEMF 3 and SG2, as the remark in the Column (c) is “No”, which implies that the GDP growth in Sri Lanka in the previous year is less than the average growth in the preceding five years. Therefore, return decision has not been driven by the rapidly growing Sri Lankan economy. Moreover, it is less realistic to assume that less than one percent incremental growth in GDP can influence the return decision of a skilled migrant. Therefore, in the next step, individuals that made the remark “Yes” as indicated in the Column (c) but the values in the columns (a)-(b) are less than one were also excluded. Finally, there was one individual (SG3) who supported the claim that economic growth might have motivated the return decision. During

the six decades of post-independence growth trajectory, Sri Lanka experienced its first ever negative GDP growth in 2001. Therefore, the average of economic growth between 2001 and 2005 cannot be attributed to the rapid growth in Sri Lanka as it was in the recovery process after the negative growth in 2001. However, Sri Lanka achieved a remarkable GDP growth after 2009 with an average GDP growth of 7.5 from 2010 to 2013. Therefore, based on the explanations above, GDP growth may be a determinant for the returnees after 2009.

This can be further verified using the data from the survey of RSMs. Accordingly, more than 57 percent of 71 survey respondents, who returned after 2009, agreed that the growing economy was one of the factors that motivated their return decisions.

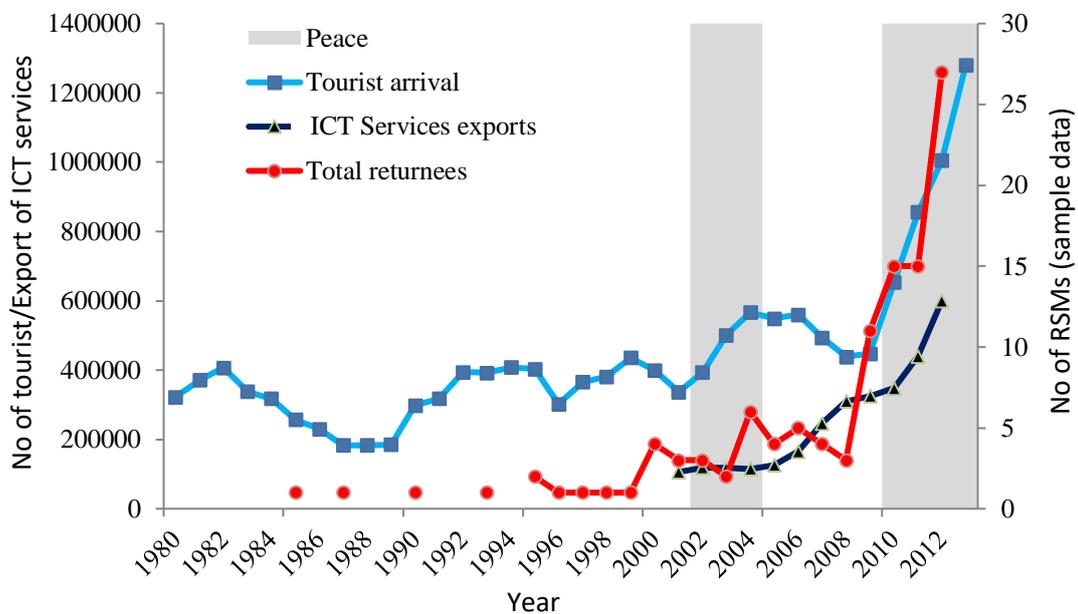
In a similar manner, the impact of host country growth on the return decision of REs is presented in the Column (f) of Table 5.3. There were three individuals with negative values in the columns (d)-(e), namely, SG1, EM3 and SG2, therefore, “Yes” in the Column (f). Remark “Yes” in the Column (f) potentially supports the claim “return decision has been driven by declining growth in the host country.” However, the first two individuals, namely, SG1 and EM2, can be excluded as the growth differences are less than one percent. Moreover, the last individual, SG2, can be easily rejected as economic growth in Sri Lanka in the same reference year (2001) was the worst in the post-independence period. Therefore, none of the case study respondents have been motivated by the declining economic growth in the host countries.

5.4.3.2 Peaceful environment in Sri Lanka

As highlighted in Subsection 3.3.1, the civil war was a key determinant of migration of skilled people in Sri Lanka. Therefore, the end of the civil war, which lasted for more than three decades, in 2009 and the post-war peace that followed could be a significant factor that motivated the brain circulation in the KSI. However, the similar trend of brain circulation could not be observable in other industries in Sri Lanka, and in contrast, brain drain has increased in some other sectors such as health and science. Figure 5.2 is useful to understand the complicated influence of post-war peace on the return decision of the skilled migrants.

The figure indicates the arrival of tourists from 1980 to 2012 as a proxy for the state of peace in the country and ICT services exports as a proxy for the industry growth from 2002 to 2012. The number of total returnees to Sri Lanka was not available for the same period. Therefore, I employ the returning year of the survey respondents (126 returnees) as a proxy variable, which is illustrated in the figure as “total returnees,” to identify the trends of returning of skilled migrants. The trends of the “total returnees” variable is indicated in the secondary Y axis of the figure.

Figure 5.2: Growth of the KSI, Peace and Brain Circulation in Sri Lanka, 1980-2013



Note: ICT Services exports and arrival of tourists referred to the primary Y axis. Due to lack of data on total returnees in the industry, I employed survey respondents as a proxy variable to show the total returnees, which referred to the secondary Y axis. The shaded areas indicate peaceful years in Sri Lanka.

Source: World Bank (2012); Author’s survey data (2013).

As it is clearly observable in Figure 5.2, all the variables have shown a rapid growth in the post-war period. In order to understand how returnees were responsive to the peaceful political environment, it is important to explore the period from early 2002 to late 2004, in which, Sri Lanka had a peaceful environment⁴⁰ due to the ceasefire agreement between the

⁴⁰ Sri Lankan government and the terrorist group, commonly known as LTTE, signed a peace agreement in 2002, which was mediated by the Norway government. There were no major hostilities in the first three years. In all the means, 2002-2004 were peaceful years in the Sri Lankan history.

government and the terrorists. The peaceful environment during the period clearly reflected by the tourist arrivals, which showed a rapid increase from 337,000 in 2001 to 566,000 in 2004. During the same period, however, a significant increase in returning skilled migrants was not reported. While the civil war ended in the middle of 2009, a significant increase in the returning of skilled migrants was already visible by 2008. Moreover, if post-war peace is sufficient to stimulate brain circulation, a similar trend should be observable in other industries in the post-war period. Therefore, it is difficult to attribute the increased flow of skilled returnees to the post-war peace *per se*.

It is worth noting the experience of a respondent, SG1, on the peaceful environment in Sri Lanka at the time of his arrival. The security conditions were the worst at the time of his returning. He returned to Sri Lanka after a few days of the 2001 terrorist attack on the Colombo International Airport. He explained an economically devastating event in a blog post⁴¹ at the tenth anniversary of his returning as follows:

“I remember that there were pieces of airplanes on the ground at the Colombo Airport when we landed, the dreaded LTTE⁴² had brazenly attacked the airport just 10 days before that destroying three Sri Lankan Airlines planes and damaging three more as well as damaging or destroying 26 Air Force aircrafts and killing a bunch of people” (SG1, 2011).

The experience is not an isolated event in the context of Sri Lanka. Terrorists frequently attacked Colombo District until the end of the civil war in 2009. Table 5.7 shows the number of terrorist attacks in the district with details of some major incidents. Only in 2008, there were 11 terrorist attacks in various locations of the districts and zero cases during the period 2002-2004 and the post-war period after 2009.

⁴¹ Extracted from a blog post of SG1 titled “10 years since returning to Sri Lanka (2011).”

⁴² Liberation Tigers of Tamil Eelam (LTTE) is a terrorist organization operated in northern and eastern Sri Lanka from 1983 to 2009.

Moreover, about 50 percent out of 71 skilled migrants, who returned after 2009, agreed that peaceful environment was one of the factors that motivated them to return. These returnees are predominantly RSEs. Therefore, I conclude that the weakening security condition in the country was not an obstacle for REs, whereas RSEs should have considered the peaceful environment in the country.

Table 5.7: Number of Terrorist Attacks in Colombo District, Sri Lanka, 1995-2013

Year	No of terrorist attacks	Major incidences/Targets
1995	5	Crude oil storage center; Sri Lanka Army Headquarters
1996	2	Central Bank building; Railway Station, Dehiwala
1997	1	World Trade Center building
1998	3	Two attacks on civilian buses
1999	2	Attack on Sri Lankan President
2000	5	Prime Minister Office, Industrial Minister, General Hospital,
2001	1	International Airport
2002	0	None
2003	0	None
2004	0	None
2005	1	Foreign Minister
2006	5	Army Commander, Secretary of Defense, Pakistan Ambassador to Sri Lanka
2007	5	First air attack on Colombo
2008	11	National Building Minister, Minister of Highways and Road Development, Three attacks on Sri Lanka Railway, Four attacks on Civilian buses
2009	1	Suicide air attack on Colombo
Since 2010	0	None

Source: Ministry of Defense (various years)

This section presented the micro, meso and macro levels determinants of brain circulation. In addition to the determinants, it is important to know whether they are temporary returnees or permanent returnees. Section 5.5 analyzes the temporal nature of brain circulation.

5.5 Temporary Nature of Brain Circulation

In addition to the question as to what motivated the brain circulation in the KSI in Sri Lanka, Subsection 5.5.1 analyzes whether the brain circulation is a temporary flow of skilled migrants or not. The reason why some REs became transnational entrepreneurs referred to as entrepreneurs who stay in the host country while running a business in the home country, is analyzed in Subsection 5.5.2.

5.5.1 Is brain circulation a temporary flow of skilled migrants?

According to the Survey of RSM, nearly 100 returnees (80 percent of the returnees) had specific plans to settle permanently in Sri Lanka. This is contradictory to the arguments of the temporal nature of the brain circulation. The temporal nature is kept but does not apply commonly to both REs and RSEs. In this subsection, I test the second hypothesis presented in Subsection 4.4.3 in Chapter Four. As I assumed in the second hypothesis, entrepreneurs in the KSI are less likely to return permanently as they need to maintain a close connection with the technology centers such as Silicon Valley.

Table 5.8 presents the probit estimation of Model 3 (Equation (4.12)) that estimated with 125 individual observations. The specification of the model was tested using Hosmer and Lemeshow's goodness of fit test and the reported p value of the test is greater than the alpha value 0.05. Therefore, the test does not reject the specification of the model. Moreover, robust standard errors were applied to determine the significance levels.

None of the DFs were significant determinants of the intended stay of the returnees. However, given the fact that 86 percent of 126 respondents in the sample are less than 44 years of age and over 80 percent are permanent returnees, the process should be identified as a "Salmon run" where middle-aged skilled migrants return to settle permanently in the country. None of the other demographic factors such as gender, nationality and civic status, critically differentiated the permanent and temporary returnees.

Table 5.8: Regression Results on the Determinants of Returning Permanently

Dependent variable takes 1 if the intended stay of the returnee is permanent and zero otherwise	Probabilities of returning permanently
<u>Controlling and explanatory variables</u>	
Age	0.008 (1.491)
Age square	-0.0006 (-1.628)
Gender	-0.063 (-0.785)
Civic status	-0.030 (-0.362)
Nationality	0.011 (0.102)
Non-degree holders	-0.062 (-0.513)
Maximum bachelor's Degree	-0.070 (-1.043)
Working experience in an OECD country	-0.017* (-1.776)
SF (Having school-age children at the time of returning)	0.165** (2.510)
Entrepreneur (entrepreneur=1 and employee=0)	-0.180* (-1.668)
Observations	125
Pseudo R2	0.145
Probability>chi2	0.014
Hosmer and Lemeshow's goodness of fit test	0.737

Note: Estimated results of Equation (4.12) is presented in the table. Robust z-statistics in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Source: Author's survey data (2013).

Among the human capital indicators in Model 3, only the coefficient of *workin_experience_in_an_OECD_country* has a negative and significant impact on the dependent variable. Accordingly, returnees who have worked in an OECD country are less likely to return permanently compared to the returnees who do not possess that experience. This supports the general trend where those who are working in the Middle East countries usually

do not intend to settle permanently whereas those who are working in developed countries such as the U.S.A. and the U.K. are more likely to settle there permanently.

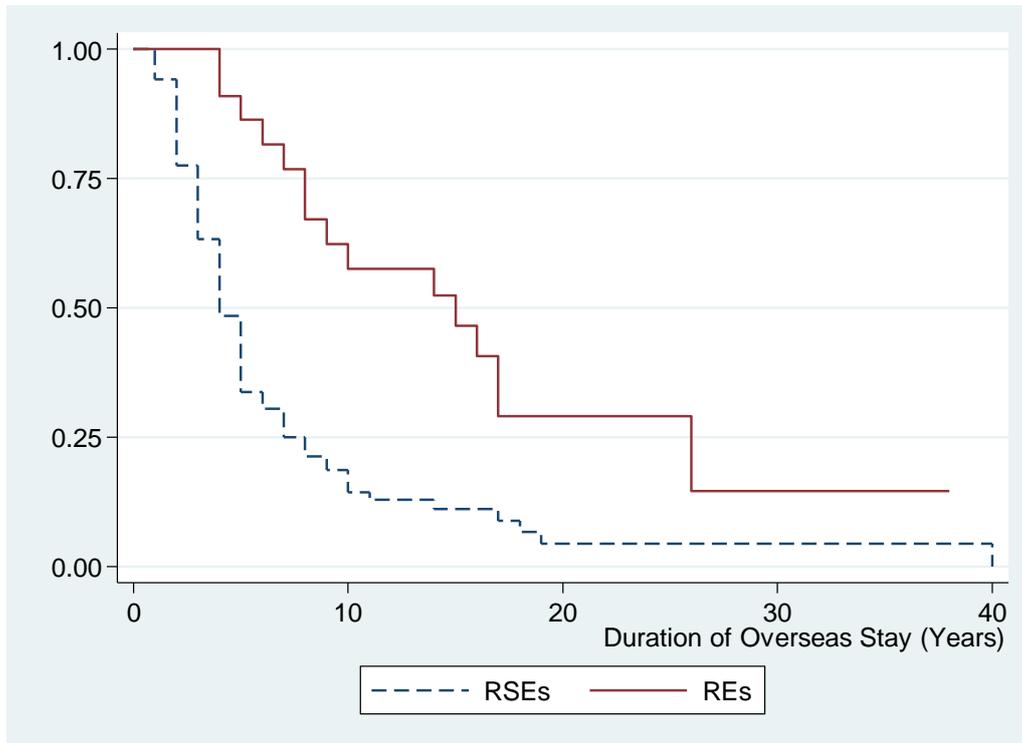
Skilled migrants might have a motivation to re-migrate if he/she returned prior to finishing the postgraduate studies. Thus, those who have completed their postgraduate studies might want to settle permanently in the host country than those who are still in the middle of their education spectrum. Nonetheless, there were no such differences among the education groups in the model.

The coefficient of the *SF* shows a positive and highly significant effect on the dependent variable, suggesting that the returnees who had school-age children at the time of returning tend to be permanent returnees too. Most of the parents prefer to educate their children in Sri Lanka, particularly during their teenage. There are two reasons for this choice. First, it enables children to be natured with the Sri Lankan identity. Second, most of the migrants in Western countries are afraid to raise their children in independent and individualistic Western culture.

The coefficient of the *entrepreneur* variable is negative and highly significant. This indicates that, after controlling for other factors, entrepreneurs tend to return temporarily compared to the skilled employees. Precisely, when evaluated at the mean values of the other independent variables, the probability of returning permanently is 0.68 for REs, and it is 0.85 for RSEs. Therefore, it is conclusive, and the results of the analysis fails to reject the second hypothesis (see Subsection 4.4.3) that the temporal nature of the brain circulation is more applicable to the entrepreneurs.

The above model does not take the timing of the returning into account. Therefore, I analyze the duration of the returnees' overseas stay using the survival analysis. I consider the duration of staying overseas of the respondents, who returned permanently to Sri Lanka as the duration variable. Accordingly, there are different durations for the respondents who returned permanently, in different years, and censored for those who returned temporarily. Simply, the temporary returnees to Sri Lanka are regarded as returnees staying abroad permanently.

Figure 5.3: Relationship between Probability of Staying Abroad Permanently and Duration of Overseas Stay



Note: The vertical axis represents the probabilities of staying abroad permanently. In this calculation, temporary returnees to Sri Lanka are regarded as returnees staying abroad permanently.
 Source: Author's survey data (2013).

Figure 5.3 shows the Kaplan-Meier survival estimate of the returnees by their status; employee or entrepreneur. The two data series show the probability of staying abroad after certain years of their stay abroad. For instance, the probability of staying abroad further after ten years of overseas stay is less than 0.25 for RSEs but over 0.50 for REs. Accordingly, entrepreneurs are less likely to return permanently after a certain number of years compared to the skilled employees. Therefore, it further confirms that the temporal nature of the brain circulation is more applicable to entrepreneurs than to employees.

5.5.2 Why REs become transnational entrepreneurs?

In addition, I consider why some of the entrepreneurs become temporary REs while others are permanent returnees, focusing on 10 REs. The resettlement status of the REs and some of the useful characteristics of the REs' firms are presented in Table 5.9. REs' status, whether permanently settled in Sri Lanka or transnational entrepreneur, is presented as "status at the

beginning” and “status in 2013.” Among the 10 REs under study, two can be considered as transnational entrepreneurs when they started their businesses in Sri Lanka.

For example, EM3 is a returnee from the U.K., who migrated from Sri Lanka for his higher studies. He is a dual citizen of both Sri Lanka and the U.K. and holds a doctoral degree in Artificial Intelligence from the City University, the U.K. He continued to work as a freelance consultant in the U.K until he started his own company.⁴³ In 1999 he started a software company in Sri Lanka to provide BPO services to the clients in the U.K. Later, his company developed a platform, which is known as TRAVELBOX in travel reservations. EM3 continued to stay in the U.K. until 2009 but traveled back and forth between the U.K. and Sri Lanka once in every month to monitor the software development center located in Colombo. However, in 2009 he decided to return to Sri Lanka permanently to closely monitor the expansion of the product range of his business.

Similarly, ExEEMF 2 is an ex-employee of Virtusa, and migrated to Australia for his higher studies. He holds a masters’ degree in Information Systems from the University of Melbourne. He started the Sri Lankan operation of his business in 2007 while staying in Australia.⁴⁴ The main software product of his company was Creatly, which is a special software used for data analysis and presentations. He also continued to stay in Australia until 2011 but traveled between Colombo and Melbourne four to five times a year. Since 2011, he has permanently settled in Sri Lanka and working with his software development team in Colombo. As he explained, “the settlement decision depends on the success of the business. Currently, I’m settled in Sri Lanka because my business is doing well here. If I cannot make it, I might return to Australia.”

⁴³ Based on the interview with the EM3 at his office premises in Colombo, Sri Lanka

⁴⁴ Based on the interview with the ExEEMF 2 at his office premises in Sri Lanka

Table 5.9: Characteristics of REs' Firms and Resettlement Status of REs

REs	Characteristics of REs' firm		Characteristics of returned entrepreneur				
	Starting year in Sri Lanka	Global presence	Year of return to Sri Lanka	Nationality	Residing in 2013	Status at the beginning	Status in 2013
EM3	1999	Sri Lanka, U.K.	2009	Dual Citizen	Sri Lanka	Transnational Entrepreneur ⁴⁵	Settled in Sri Lanka
ExEEMF2	2007	Sri Lanka Australia	2011	Sri Lankan	Sri Lanka	Transnational Entrepreneur	Settled in Sri Lanka
EM1	1995	North America Europe Asia	1995	Dual Citizen	U.S.A.	Settled in Sri Lanka	Transnational Entrepreneur
EM4	1995	North America Europe Asia	1995	Dual Citizen	U.S.A.	Settled in Sri Lanka	Transnational Entrepreneur
EM2	1997	Sri Lanka India Singapore Australia	1996	Sri Lankan	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka
SG1	2005	Sri Lanka, U.S.A. U.K.	2001	Sri Lankan	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka
SG2	2002	Sri Lanka U.S.A.	2002	Dual Citizen	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka
SG3	2005	Sri Lanka U.S.A.	2006	Dual Citizen	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka
ExEEMF1	2004	Sri Lanka Norway	2000	Foreigner	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka
ExEEMF3	2010	Sri Lanka U.S.A.	2000	Sri Lankan	Sri Lanka	Settled in Sri Lanka	Settled in Sri Lanka

Source: Author's survey data (2013); Official websites of the REs' firms (2013).

⁴⁵ Transnational entrepreneur is a skilled migrant who stay in the host country while running a business in the home country

In contrast, EM1⁴⁶ is a returnee from the U.S.A. He migrated for his higher studies and continued to remain in the U.S.A. to work for several US organizations after his graduation. EM 1 is a dual citizen of Sri Lanka and He settled in Sri Lanka when he started his firm Virtusa in 1995, and later settled in the U.S.A. The firm's client base was largely concentrated in the U.S.A. and Europe. Therefore, he decided to settle in the U.S.A. after successfully launching the business operation in Sri Lanka.

Accordingly, the temporal nature of brain circulation could occur for several reasons. The settlement decision of a returned entrepreneur may be affected by the market orientation of the business where the major clients are located, the type of products and the importance of REs' involvement in the business process. In the case of EM1, the firm is mainly involved in business process outsourcing. Therefore, it is necessary to locate closely to the customers than the development centers. In contrast, EM3 is involved in a software development business. Therefore, it is necessary for him to settle much closer to the software development center in Colombo in order to become involved actively in research and development activities.

However, these entrepreneurs tend to travel frequently back and forth between developed countries and Sri Lanka. According to the Survey of RSM, the number of times these REs travel between host country and Sri Lanka per year was six times for an entrepreneur.⁴⁷ Therefore, the location has not been an obstacle to run a business due to increased physical movements between the home country and the host country. And also, staying virtually in the home country has become economical and convenient thanks to the advancement of communication technologies. Therefore, entrepreneurs tend to stay connected to the technological frontier and the customers to keep up with the rapidly changing technology and customer preferences. The next section analyzes the transnational capital of the returnees.

⁴⁶ Based on the interview with Senior Vice Present of the firm founded by EM1 at the office premises.

⁴⁷ Author's survey data (2013)

5.6 Transnational Capital of the Returnees

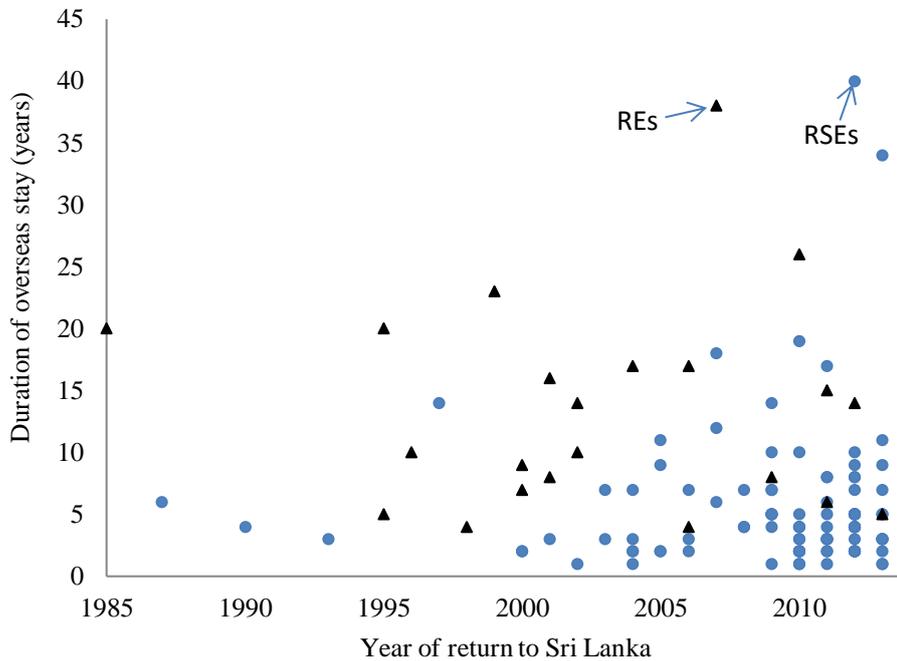
Transnational capital refers to the additional value added to a migrant's human capital during his/her overseas stay. In this subsection, I analyze the transnational capital using four indicators that enhance the human capital of a migrant, namely, the duration of returnees overseas stay, foreign education, foreign working experiences and networking. The data from Survey of RSMs was employed to analyze the first three indicators and networking is analyzed with focus on REs.

5.6.1 Duration of returnees' overseas stay

On average, respondents under study stayed abroad for about seven years before returning to Sri Lanka. The median overseas stay was five years. The duration of overseas stay for RSEs and REs are presented in Figure 5.4. The figure indicates an increasing trend in the number of returnees with shorter durations of overseas stay and a few returnees with longer durations of overseas stay in recent years. Overall, the average duration of overseas stay of returnees is declining. The duration of overseas stay was nine years for returnees who returned before 2000 compared to 6 years of overseas stay for the returnees who returned after 2010.

Entrepreneurs tend to have stayed longer overseas compared to skilled employees. The average durations of overseas stay for entrepreneurs and employees were 13.5 and 5.6, respectively. On average, an entrepreneur has stayed more than twice longer than an employee. The median overseas stay also provides a similar result, which is 12 years for entrepreneurs and four years for employees. Longer overseas stay enhances the value addition to one's human capital through the exposure to the developed-country conditions.

Figure 5.4: Durations of Overseas Stay of RSEs and REs



Note: N=126
Source: Author's survey data (2013).

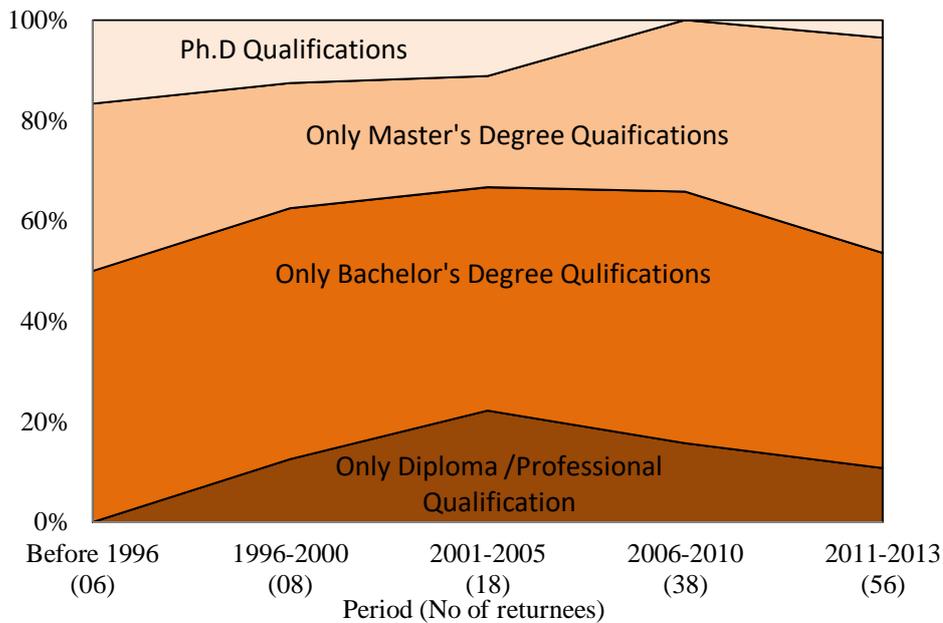
5.6.2 Foreign education

Developing countries such as Sri Lanka send their skilled people to developed countries to acquire advanced knowledge that has been accumulated in those countries. If returned, these foreign-trained skilled people are expected to help developing countries to expedite the catching-up process through technology borrowing. Education is considered as a significant component of transnational capital, as advanced education, in particular, in science and technology, could expose the skilled migrants to new knowledge, systems and procedures, institutions and networking among classmates. One of the key characteristics of the current flow of brain circulation in the KSI to Sri Lanka is that an increased share of highly educated returnees in recent years. Figure 5.5 shows the educational qualifications of the returnees in the sample.

At the early stage of the industry prior to 1996, only a few people returned, mostly with post-graduate qualifications. Later, when the industry achieved a momentum, the share of skilled migrants without bachelor's degrees increased up to 22 percent. Once the industry

growth is observable, highly educated people with post-graduate qualification started returning in large number. For instance, the share of skilled migrants with post-graduate qualifications increased from 33 percent in 2001-2005 to 47 percent in 2010-2013.

Figure 5.5: Education Qualifications of RSM, 1996-2013



Source: Author's survey data (2013).

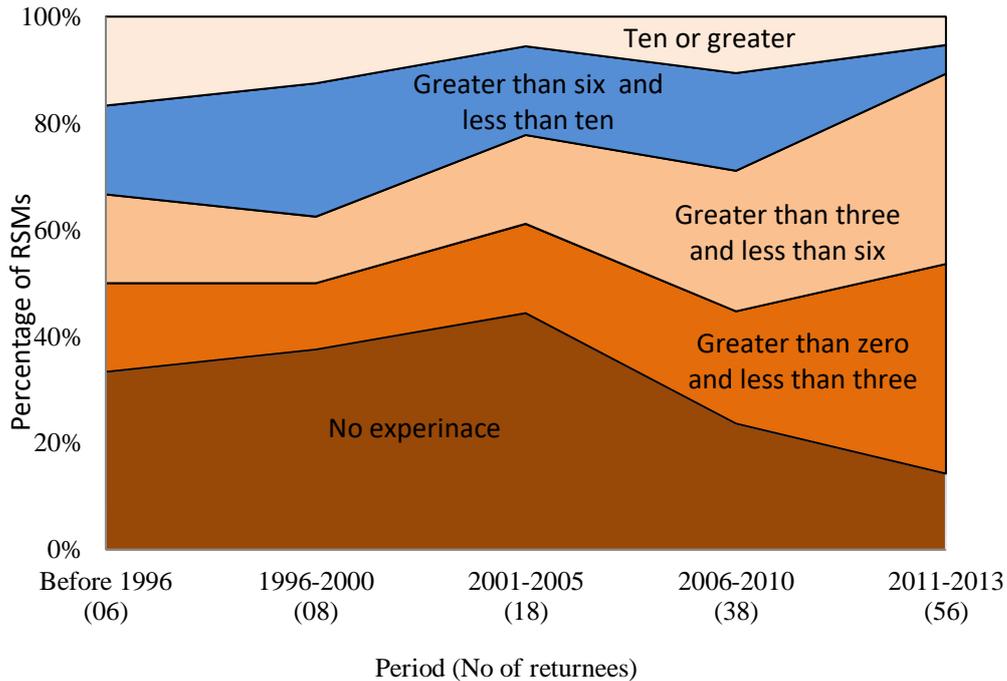
Further, REs tend to have higher educational attainments abroad than the skilled employees. Based on the Survey of RSM, on average, returned entrepreneurs studied up to masters' degree level, compared to the skilled employees who studied up to bachelor's degree level.

5.6.3 Working experiences abroad

Figure 5.6 shows a changing pattern of foreign working experiences of the returnees. Accordingly, until 2005, the share of the skilled returnees who had no working experiences abroad increased drastically from 33 percent in 1996 to 44 percent in 2005. In the latter part of the industry growth, more experienced returnees arrived. For instance, by 2011-2013, the no experience category decreased to 14 percent, whereas the share of returnees with more than three years overseas experiences increased to 46 percent. Working experience in a developed country could help the migrants to acquire key scientific knowledge if they had

worked as professionals. They have a chance to become exposed to codified knowledge as well as tacit knowledge, which is rarely transferred to developing countries. If they have had a chance to become involved in management activities such as HR, R&D and marketing, it would be a definite improvement of their human capital.

Figure 5.6: Overseas Working Experiences of RSMs, 1996-2013



Source: Author's survey data (2013).

Of the total respondents of 126, over 65 percent were employed as professionals in various technical positions, and nine respondents held various managerial positions during their overseas stay. Importantly, five respondents were involved in entrepreneurial activities related to knowledge services before they returned to Sri Lanka. Moreover, REs have six and a half years of overseas working experiences, on average, compared to three years average of the RSEs.

5.6.4 Networking

Some scholars argue that REs underperform compared to their domestic counterparts due to the lack of local social networks (Chen, 2008; Obukhova et al., 2012). The returnees might experience a diminishing impact on the local networks when they stay abroad for a longer

period. However, it is less realistic to assume a similar effect on family networks of the skilled migrants. Although the returnees' networks tend to diminish over time, family members who did not migrate can be vital assets to regain those diminished networks. I capture the effect of local networks on the probability of being an entrepreneur in Table 5.5 using a proxy variable: having attended a popular school in a major city in Sri Lanka. However, the effect was not significant in all the three specifications.

Such proxy variables are not sufficient to capture the broader meaning of networking. Therefore, I analyze the relationships among founding members of the firms under study to examine the types of networks that have been effectively utilized by REs when they start new ventures in Sri Lanka.

Skilled migrants have a chance to develop networks during their overseas stay, in particular, when studying in foreign universities and working at MNCs in developed countries. In the KSI, many REs have effectively utilized these networks to start businesses in Sri Lanka. Table 5.10 shows various types of relationships observed among founding members of the nine firms under study. Four major types of networks were observed, namely, co-worker networks, foreign friends, diaspora networks and kinship networks. Co-worker networks refer to networking with ex-co-workers of the REs. If a returned entrepreneur and his/her co-founder have worked for the same company before they start the business, such relationships are classified as co-worker networks. If a co-founder is a foreign national from the same country in which the returned entrepreneur resided before returning to Sri Lanka, such relationships are termed as foreign friends. If one of the co-founders is non-residing Sri Lankan or a close relative of the REs, those relationships are classified as diaspora networks and kinship networks, respectively. Co-worker networks are the most commonly observed type of networking among the REs. REs have collaborated with their ex-co-workers, mostly from developed countries, to start their business in Sri Lanka. It is worth examining some concrete cases in detail to understand the importance of such ex-coworker relations.

Table 5.10: Types of Co-founder Networks

REs	Year of starting the business in Sri Lanka	Presence of co-worker relations		Presence of foreign friends	Presence of diaspora relations	Presence of kinship relations
		Foreign	Local			
EM1	1995	yes	No	yes	No	Yes
EM2	1997	no	No	no	Yes	Yes
EM3	1999	no	No	yes	No	Yes
SG2	2002	no	No	no	No	Yes
ExEEMF 1	2004	no	Yes	no	No	No
ExEEMV 2	2005	yes	No	no	Yes	No
SG1	2005	yes	No	no	No	No
SG3	2005	yes	No	no	No	No
ExEEMF 3	2010	yes	No	yes		No
Count of yes (out of nine)		5	1	3	2	4

Note: If at least one network type is present among founding members, the remark is yes, otherwise, no.

Co-worker network exists if cofounders have worked together prior to start the business.

Presence of diaspora relation means the presence of a Sri Lankan diaspora members in the founding team other than the REs.

Presence of kinship relationship means the presence of a closer relative such as father, mother, brother or sister in the founding team.

Source: Authors Survey data (2013).

Both EM1 and EM4 are the founding members of Virtusa in 1995. Prior to starting Virtusa and returning to Sri Lanka, both EM1 and EM4 were founding team members (employees) of INSCI Corporation in the U.S.A. The firm was co-founded by a friend of EM1 (hereafter DG) in 1989. DG was the Executive Vice President of the firm and EM1 held various positions such as Senior Vice President and Chief Technology Officer during his tenure at INSCI Corporation. One of the products developed by EM4 when she was working for INSCI Corporation was selected as the product of the year by the Association of Imaging and Information Management. In 1995, EM1, EM4, DG and his wife co-founded Virtusa, and today, it is the benchmarked firm in the KSI in Sri Lanka.

A similar story was found in the case of WSO2, one of the fastest growing firms in the industry. SG1 co-founded WSO2 together with his ex-coworker (hereafter PF) in 2005. Both

SG1 and PF worked for IBM from 1998 to 2005. In addition, SG1 and PF co-created the Web Services Invocation Framework while they worked for IBM Research. The firm co-founded by SG1 and PF competes with IBM in the middleware market.

Moreover, the co-founders of Ridgecrest Ltd. also have a similar background. When SG3 worked as the Managing Director of Schwab Soundview Capital Markets, a finance company registered in the U.S.A., RH was the Vice President of the company. Later, in 2005, both SG3 and RH co-founded the Ridgecrest in Sri Lanka. As these examples suggest, the REs are endowed with coworker networks that they have built in the host country, and later have effectively utilized these networks to start their business in Sri Lanka.

Some REs have co-founded their business together with foreign friends in the host country. For instance, when EM3 started the Codegen International, he collaborated with one of his friends (hereafter BP) in the U.K. Currently, BP is the Commercial Director of the company who handles the sales and marketing of the Codegen products. Cinergix was co-founded by SG2, a returned entrepreneur, together with NF and CS. SG2 and CS were graduate students of University Melbourne from 2005 to 2007 prior to starting the business in 2007. Therefore, in the case of Cinergix, relationships among classmates have been transformed into a business relation as the co-founders of the business.

In general, a diaspora network is a common mode that connects the developed country and the developing economies. In Sri Lanka, however, the role of diaspora is questionable due to the ethnically divided and non-cooperative nature among the diaspora members. However, there were cases that belonged to diaspora connections among the co-founders.

Kinship networks have emerged as another frequent type of networking among the founding members. For instance, among the six co-founders of Virtusa, four members are relatives. In the case of Codegen, EM3 and his brother KS co-founded the business in 1999. Moreover, EM2 has co-founded hSenid International together with his brother SS in 1997.

Further, SG2 co-founded the Calcey Technologies in 2002 together with his father, brother and spouse.

Kinship networks were a prominent type of networking among the EMs in the industry. Accordingly, in all the three cases in the category of Early Movers, namely, EM1 (EM4 also from the same firm), EM2 and EM3, at least one founding member is a relative of the returned entrepreneur. When EMs returned to Sri Lanka, the KSI was not well-known at the local and global levels. Therefore, REs have utilized their kinship relations to overcome the difficulty in finding business partners and also to strengthen the weakening local networks. However, the importance of family networks has declined for the second generation as reflected in Table 5.10. Finding business partners has become easy when the industry started growing, and the industry receives the attention of investors at local and global levels. None of the ex-employees has relied on any of the family networks when they started the businesses. Ex-employees have worked in the industry for a certain number of years before starting their business. Therefore, clearly, they have active networks both at international and local levels.

Transnational capital accrued through co-worker networks and other means have influenced the business formation in the KSI of Sri Lanka. When the industry growth is observable, co-worker networks have become a common way of starting new ventures. Yet, at the early stage of the industry growth, REs tended to rely more on kinship networks as a mode of regaining their lost connections in the home country. Later, once the industry started developing, the importance of kinship networks has diminished.

5.7 Policy-Driven or Market-Driven Brain Circulation

In the early experiences of brain circulation in Taiwan and South Korea, the government played an active role in promoting return migration. However, the Sri Lankan government has played a passive role in bringing Sri Lankan skilled migrants back to the country.

The Sri Lankan government has heavily invested in higher education and health while it is experiencing a severe outflow of skilled migrants. Moreover, the end of civil war in 2009 has encouraged the returning skilled migrants because of peaceful environment, political stability and rapid economic growth in the post-war period in the country. Therefore, the government has facilitated the returnees by providing macro-level stability.

Other than that, the Sri Lankan government has failed to intervene at a minimum level by activating dual citizenship granting process. Facilitating dual citizenship is important to encourage returnees to stay connected with their home countries. However, the policy to grant dual citizenship that was introduced to Sri Lanka in 1988 was not active from 2011 to 2015. In addition, a favorable industrial policy for investments such as tax holidays and special privileges if registered under the BOI Sri Lanka, have encouraged the REs, however, to a certain extent. These tax holidays are general incentives provided by the Sri Lankan government to attract FDIs. Yet, an aggressive policy that directly targets the returning entrepreneurs or RSEs as in the case of China has not been implemented in Sri Lanka.

The discussions with key informants revealed that the government has not implemented any policies to promote return migration or reverse brain drain in Sri Lanka, other than general incentives and promotions provided for foreign investors. The same finding was emerged through the survey of RSM. Among 126 respondents, no one agreed that they received any material or non-material benefits from the government. Therefore, it is clear that the brain circulation in Sri Lanka is not a policy driven process.

5.8 Chapter Summary

In this chapter, I examined the determinants of brain circulation; return decisions of skilled migrants in the KSI in Sri Lanka. In addition, the temporal nature of brain circulation and transnational capital of the returnees were analyzed. This chapter focused on the industry-specific nature of brain circulation using firsthand data collected through a survey of RSMs and success stories of 10 REs. The findings presented in this chapter are summarized below.

First, with regard to the profile of returnees, a large number of young migrants, predominately ethnic Sinhalese, and males have returned. Most of them have returned after higher education as fresh graduates with an average of four years of overseas working experiences. Many returnees are married and returned together with their families, many returnees were non-residing Sri Lankans and dual citizens, implying a permanent returning plan of the respondents. However, the profile of the REs were somewhat different from that of RSMs. Many senior returnees became entrepreneurs in the KSI. Many foreign citizenship or dual citizenship holders started their own businesses. Importantly, out of six returnees with doctorates, five become entrepreneurs.

Second, pull factors have driven the current flow of brain circulation in the KSI. Yet, to a much lesser extent, push factors have influenced the return decision of skilled employees. Among the pull factors, most agreed ones were socio-cultural determinants and post-war peace. The pattern of reasoning drastically differed for REs and RSEs. Family considerations were the most agreed motivational factor for RSEs. However, those for the REs were the patriotic feelings and social ties to the home country. In addition, REs agreed that growing business opportunities, economic growth, growing employment opportunities and government incentives influenced the decision to return. Based on a Chi square test, I found that the impact of four motivational factors, namely, growing business opportunities, post-war peace, patriotic feeling and social ties, and government incentives on return decision were significantly different for REs and RSEs.

Third, key meso-level factors, namely, wage premiums, impact of industry growth, and probability of a returnee becoming an entrepreneur, were analyzed. The KSI has generated wage premium for the returnees. RSMs sacrificed around US\$ 2,000 per month, when returning to Sri Lanka. However, their average post-return salary was almost similar to the salary of a senior professor in a national university in Sri Lanka. Therefore, the findings suggest that the KSI has generated wage premium for the returnees. Next, the growth of the

KSI has significantly motivated the return of female migrants, ethnic Sinhalese, postgraduate degree holders and employees with foreign working experiences. Importantly, a significant number of employees have returned since 2009, as the industry growth became visible. On the other hand, entrepreneurs returned when industry growth was not visible before the industry took off in 2009. Thus, the findings suggest that the industry growth is not a significant factor that motivates entrepreneurs to make the return decision. Further, the probability of a returnee becoming an entrepreneur after returning to Sri Lanka was also analyzed. Accordingly, age and nationality were significant determinants of entrepreneurship. General indicators of human capital such as years of working experience and level of education failed to predict the probability of becoming an entrepreneur correctly. This indicated the importance of transnational capital in the context of brain circulation research. Once the indicators of transnational capital such as years of working experience abroad and foreign education were introduced, the probability of becoming an entrepreneur was correctly predicted. Accordingly, the probability of a returnee becoming an entrepreneur was higher for foreign degree holders, for returnees who had done entrepreneurial activities abroad and for returnees whose parents are graduates.

Moreover, if the return decision is motivated by the growing employment opportunities within the KSI, such returnees have a lower probability of becoming an entrepreneur in the KSI. Similarly, those who are motivated by the peaceful environment of the country have a lower probability of becoming entrepreneurs. In contrast, returnees who are motivated by the growing business opportunities in the KSI were more likely to become entrepreneurs. Therefore, it is evident that RSEs and REs respond differently to industry growth.

Fourth, the probit estimation of Model 3 found that returnees who have worked in an OECD country are less likely to return permanently compared to the returnees who do not possess that experience. Moreover, returnees who had school-age children at the time of return tend to be permanent returnees. Importantly, the results suggested that the

entrepreneurs are less likely to return permanently compared to the skilled employees. Kaplan-Meier survival estimate of the returnees by their status; employee or entrepreneur identified that the probability of staying abroad after certain years of their stay abroad is higher for entrepreneurs. Therefore, it further confirmed that the temporal nature of the brain circulation is more applicable to entrepreneurs than to skilled employees. Moreover, qualitative analyses of ten success stories of REs found that the settlement decisions of returned entrepreneurs were affected by the market orientation of the business where the major clients are located, the type of products, and the importance of REs' involvement in the business process. Transitional entrepreneurship is promoted by the increased physical movements between the home country and the host country. On average, the number of times these REs travel between their host country and Sri Lanka per year was six times for entrepreneurs. Staying virtually in the home country has become economical and convenient, thanks to the advancement of communication technologies. Therefore, entrepreneurs tend to stay connected to the technological frontier and the customers to keep up with the rapidly changing technology and customer preferences.

Fifth, the transnational capital of RSMs were analyzed using the duration of overseas stay, years of foreign education, working experience abroad and networking. The average durations of overseas stay for entrepreneurs and employees were 13.5 and 5.6, respectively. Longer overseas stay enhances the value addition to one's human capital through the exposure to the developed-country conditions. Entrepreneurs tend to have stayed longer overseas compared to skilled employees. Further, REs tend to have higher educational attainments abroad than the skilled employees. On average, returned entrepreneurs studied up to masters' degree level, compared to the skilled employees who studied up to bachelor's degree level. In terms of working experiences abroad, over 65 percent of 126 respondents were employed as professionals in various technical positions and nine respondents have held various managerial positions during their overseas stay. Importantly, five respondents were involved

in entrepreneurial activities related to knowledge services before they returned to Sri Lanka. Moreover, REs had six and a half years of overseas working experiences, on average, compared to an average of three years for the RSEs. Four major types of networks were observed at the business formation of REs, namely, co-worker networks, foreign friends, diaspora networks and kinship networks. Co-worker networks are the most commonly observed type of networking among the REs. REs have collaborated with their ex-co-workers, mostly from developed countries, to start their business in Sri Lanka. Some REs have co-founded their business together with foreign friends in the host country. In general, a diaspora network is a common mode that connects the developed country and the developing economies. In Sri Lanka, however, the role of the diaspora was not significant due to the ethnically divided and non-cooperative nature among the diaspora members. Kinship networks are another frequent type of networking among the founding members, particularly among the early movers in the industry.

The Sri Lankan government has not implemented any direct policy to promote reverse brain drain other than macroeconomic management and providing tax incentives to promote FDI, in general. Therefore, it is clear that brain circulation in Sri Lanka is not a policy driven process.

CHAPTER 6: REs' Advantage and its Effects on the KSI in Sri Lanka

6.1 Introduction

The return migration theories and existing studies have not adequately explained the ways in which REs contribute to business expansion and industrial growth in the home country. In addition, recent debate has raised much attention among scholars as to whether these REs perform better than locally grown entrepreneurs who are not equipped with the transnational capital. As highlighted in Chapter Two, some scholars argue that REs underperform compared to their domestic counterparts due to institutional factors, lack of local social networks and mismatches between the new venture and the institutional environment in the home country. Therefore, this chapter examines the ways in which REs' advantage contributes to business expansion. In addition, the effect of brain circulation on the KSI will be analyzed.

Section 6.2 analyzes the ways in which REs' advantage contributes to the business expansion in the home country by employing case studies of two prominent firms in the KSI in Sri Lanka. The contribution of REs to increase the exports of knowledge services in the KSI is well-recognized as highlighted in Subsection 3.4.3 in Chapter Three. However, other ways that REs have contributed need to be identified. Therefore, this section applies a case study method to analyze the effects of REs' advantage on business expansion.

Then, Section 6.3 analyzes the effects of REs' advantage on the growth of the KSI in terms of export performance, business financing and diffusion of institutional know-how. Hypotheses three to five will be tested in this section using the randomly selected 61 firms in the KSI. Finally, the chapter summary is presented in Section 6.4.

6.2 Effects of REs' Advantage on Business Expansions

Various factors facilitate the rapid growth of a particular industry, and in many cases, the growth is fueled by a few high-performing firms known as "gazelles" in the industrial

development literature (Nichter & Goldmark, 2009). However, the growth process of the KSI in Sri Lanka or the gazelles in the industry have not been studied. Therefore, I selected two prominent firms founded by REs, namely, Virtusa by EM1 and WSO2 by SG1, in the KSI in Sri Lanka as case studies to analyze the REs' advantage and its contribution to the business expansion in the KSI in Sri Lanka.

Virtusa was co-founded by EM1 in 1995 when the KSI in Sri Lanka was at the formation stage, i.e., from 1995 to 2000 (see Subsection 3.4.3 for details). Therefore, Virtusa is considered as an early mover firm in the industry. In contrast, the KSI in Sri Lanka was booming both locally and globally when SG1 started WSO2 in 2005. For instance, Carmel & Tija (2005) identified Sri Lanka as an emerging software exporting nation at the global level in 2005 (as cited in Okada, 2010, p. 205). Therefore, WSO2 was recognized as a second mover firm in the industry. As explained above, these two case studies represent two distinctive stages of the industry growth of the KSI in Sri Lanka.

Subsections 6.2.1 and 6.2.2 describe the background of the cases, i.e. REs and the firms founded by them, and Subsection 6.2.3 presents findings from the case studies.

6.2.1 Case Study I: Early mover to the industry

6.2.1.1 The returned entrepreneur: EM1

EM1 is a Sri Lankan born dual citizen of both Sri Lanka and the U.S.A. EM1 completed his secondary education in Sri Lanka and immigrated to the U.S.A. in the early 1980s for his tertiary education. He earned his bachelor's degree, B.Sc. in Computer Science, from Syracuse University in the U.S.A. in 1988.

After the graduation, EM1 joined the Independent Election Corporation of America as a Project Manager. Later he became the Director of Software Engineering of the company (Pickering, 2003, January 11). In 1989, he joined the INSCI Corporation as a founding team member and, within a short period, became the Executive Vice President and Chief Technical

Officer of the company. As a member of the management team of INSCI Corporation, EM1 helped to make it a public company (Virtusa, 2014).

In 1995, EM1 returned to Sri Lanka and started Virtusa Corporation together with EM4 (his wife), and a co-worker at INSCI Corporation. However, he continued to stay permanently in the U.S.A., becoming a transnational entrepreneur. For the contribution EM1 made to the KSI in Sri Lanka, he was awarded the most prestigious Sri Lanka Sikhamani Award in 2005, which is awarded only to 200 living Sri Lankans at a time. Globally, his contribution to the KSI is well-recognized. For instance, EM1 was named as the "2013 Large Business Leader of the Year" by the Worcester Business Journal of Central Massachusetts, U.S.A., in recognition of his contribution to the IT industry.

6.2.1.2 Virtusa: The Firm Founded by a Returned Entrepreneur

Virtusa (NASDAQ: VRTU) was first registered in Sri Lanka as Software Solutions in 1995 as a tiny organization with three engineers and five directors. In its journey, the name has been changed several times. First, the Software Solutions was renamed as Technology Providers International and incorporated in Massachusetts, the U.S.A. (NASDAQ, 2007).⁴⁸ In 1997, the company achieved BOI status in Sri Lanka and established the head office in Boston, the U.S.A. Second, it was renamed as eRUNWAY Inc. in 2000 and continued to use that name until it was renamed as Virtusa Inc. in 2002.

Virtusa was a service provider in the BPO industry at the initiation and gradually moved to innovations and to develop software products. It mainly caters to financial institutions and their portfolio consists of software products and services such as providing digital engineering services, implementation of IT platform modernizations and other digital operations (Virtusa, 2018). In recent years, Virtusa is engaged in various innovations to meet customized needs of the clients. For instance, Virtusa has helped to develop a mobile application for a leading US

⁴⁸ Company profile of Virtusa as indicated in the Initial Public Offer documents submitted to NASDAQ. Also available at <http://www.nasdaq.com/markets/ipo/company/virtusa-corp-386130-54051>.

bank, which facilitates customers of the bank to take photos of a received check and immediately deposit into his/her bank account.⁴⁹

At present, Virtusa is recognized as the leading firm in the KSI in Sri Lanka for two main reasons. First, the firm provides employment for over 2,500 Sri Lankan employees in 2013, which was the largest number in the industry. Second, the firm is one of the few surviving firms that were established at the initial stage of the KSI (the mid-1990) in Sri Lanka. Moreover, Virtusa has been recognized globally for its rapid growth. For instance, in 2012, the Forbes named Virtusa in their "100 Best Small Public Companies in America" (Virtusa, 2014).

6.2.1.3 Rapid Growth of Virtusa

Virtusa achieved a tremendous growth in the global market since its incorporation in 1995. The growth can be traced in several ways. First, the total assets base of Virtusa has increased by 547 percent from 2004 to 2013. Table 6.1 presents the rapid growth of Virtusa in the last decade in terms of assets, revenue, profit and revenue per employee.

Table 6.1: Total Assets Profit and Revenue Growth of Virtusa, 2004-2013

Item	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth (%) 2004~2013
Total assets value ⁽¹⁾	47	50	59	99	181	187	216	246	275	304	547
Profit before tax ⁽¹⁾	-0.0	1	2	15	23	13	13	18	26	36	n.a.
Revenue ⁽¹⁾	43	60	77	125	165	173	278	218	164	333	674
Revenue per employee ⁽²⁾	n.a.	n.a.	34	35	39	n.a.	n.a.	44	n.a.	48	n.a.

Note: (1) US\$ millions; (2) Revenue/number of employees in US\$ 1,000s.

Source: Various financial reports published by Virtusa.

In terms of revenue, the firm has increased its revenue by over six-fold, in the last decade. Compared to the US\$ 43 million revenue in 2004, the company generated US\$ 333 million in 2013. Not only the revenue, but the revenue per employee has also increased continuously

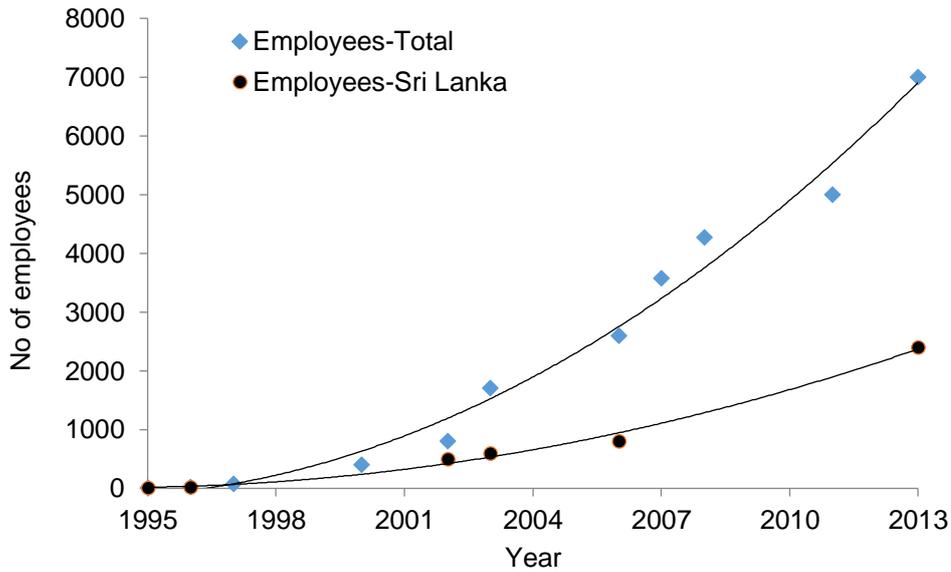
⁴⁹ Virtusa has developed highly innovative products for their high-end customers. A detail list of such products is available at <http://www.virtusa.com/resources/case-studies/>

over the last decade. The revenue per employee, which stood at US\$ 34, 000 in 2006, was US\$ 48,000 in 2013. Revenue per employee measures the revenue generated by an employee, on average, in a given year. An increasing trend in revenue per employee, which has increased by over 40 percent between 2006 and 2013, indicates that Virtusa is moving from low value-added operations to high value-added operations. Outsourcing operations such as call centers required a large number of heads (people) that can be employed at lower salaries. Yet, that kind of outsourcing operations does not generate high profit margins for the business, as many firms around the globe compete to attract such easy operations quoting low prices. However, value-added services such as software development that require highly skilled employees could generate high profit margins for the business, and thereby, earn higher revenues per employee.

Second, Virtusa achieved its growth in terms of profit and revenue in the early years by utilizing the existing IT graduates in Sri Lanka. However, due to insufficient supply of IT graduates in the country at that time, the firm established its second development center in Hyderabad, India in 1999. Currently, the firm is a global player that maintains its development centers in North America, Europe, South Asia and East Asia.

Third, the firm that started as a very small entity with three engineers employs more than 7,000 employees by 2013. The exponential growth of the number of employees in the company is depicted in Figure 6.1. About 2500 employees, which is more than 35 percent of the total employment of Virtusa, are stationed at the development center in Colombo. In addition, a large share of the employees are stationed at five development centers in India.

Figure 6.1: Employment Growth of Virtusa, 1995-2014



Source: Author's survey data (2013); Various Press Releases by Virtusa⁵⁰.

Fourth, Virtusa has gradually improved its service quality by maintaining the highest standards related to the process quality, information security and environmental safety. Table 6.2 shows a list of quality and security certifications earned by Virtusa. Although Virtusa has several Advanced Technology Centers (ATCs), only three of them have been accredited with the Capability Maturity Model Integration (CMMI) level-5 certification. Importantly, Virtusa is among the very few firms to hold CMMI level-5 certification in Sri Lanka. In addition, only the ATC in Sri Lanka and India are accredited with the four other quality certifications presented in Table 6.2. Among them, Information Security Management System certification (ISO/IEC 27001:2005), which is accredited by International Organization for Standardization (ISO) on security of the sensitive information handled by a firm, is an important certification in the BPO/KPO sector. In summary, Virtusa has improved its credibility in the KSI at the global level, while creating a world class ATCs in Sri Lanka.

⁵⁰ Available at <http://www.virtusa.com/news-room/press-releases/>

Table 6.2: Quality and Security Certificates Earned by Virtusa

Name of the certification	Level of achievement/compliance	Year of achievement	Qualified ATCs of Virtusa
Capability Maturity Model Integrated (CMMI)	CMMI level 5	2013	Colombo, Chennai and Hyderabad
Business Continuity Management System	BS 25999-2:2007	2012	Colombo, Chennai Hyderabad Bangalore Mumbai and Pune
Occupational Health and Safety Management System	BS OHSAS 18001:2007	2012	Colombo, Chennai Hyderabad Bangalore Mumbai and Pune
Information Security Management System	ISO/IEC 27001:2005	2012	Colombo, Chennai Hyderabad Bangalore Mumbai and Pune
Environment Management System	BS EN ISO 14001:2004	2012	Colombo, Chennai Hyderabad Bangalore Mumbai and Pune

Source: Author's survey data (2013); Various press releases by Virtusa.

Fifth, Virtusa is one of the leading exporters in Sri Lanka. In 2017, the firm ranked at 3rd among the best exporting brands in Sri Lanka (Brands Finance Lanka, 2017). Export performance of Virtusa was analyzed from the viewpoint of its Sri Lankan operations. A large share of Virtusa's sales is generated through the ATC in Colombo, because it is the largest development center that has been accredited with the highest level of quality certifications. The sales accrued to the Sri Lankan center should be considered as the export earnings in the Sri Lankan context. Although the revenue generated by each ATC of Virtusa is not known, its contribution to the Sri Lankan export earnings has been well-recognized.

Various organizations have recognized Virtusa as one of the best exporting firms in the KSI in Sri Lanka (see Table 6.3). The firm has been awarded the most outstanding exporter awards and exporter of the business and professional services by the most prestigious National Chamber of Exporters (NCE) of Sri Lanka, for three years from 2011 to 2013, consecutively. Moreover, in recognition of its contribution to the Sri Lankan economy, Virtusa was recognized as the most value-added exporter of the year in 2013. In 2014, Virtusa was recognized as the export brand of the year at the Brand Excellence Award, which was

organized by the Sri Lanka Institute of Marketing (SLIM). In 2015, the Brand Finance Lanka also awarded Virtusa as the most valuable IT exports brand in Sri Lanka.

Table 6.3: Awards Received by Virtusa for its Contribution to Sri Lankan Exports Sector

Institution	Award	Year
Brand Finance Lanka (Brands Annual 12 th edition)	Most valuable IT export brand in Sri Lanka	2015
Sri Lanka Institute of Marketing (SLIM) Brand Excellence Awards	Export ‘Brand of the Year	2014
National Chamber of Exporters Sri Lanka	Most Value-Added Exporter for the Year	2013
National Chamber of Exporters Sri Lanka	Exporter of the Business and Professional Services	2013
National Chamber of Exporters Sri Lanka	Most Outstanding Exporter	2013
National Chamber of Exporters Sri Lanka	Exporter of the Business and Professional Services	2012
National Chamber of Exporters Sri Lanka	Most Outstanding Exporter	2012
National Chamber of Exporters Sri Lanka	Exporter of the Business and Professional Services	2011
National Chamber of Exporters Sri Lanka	Most Outstanding Exporter	2011

Source: Various press releases by Virtusa. Available at <http://www.virtusa.com/news-room/press-releases/>

Section 6.2 presented the case of Virtusa and the details of EM1. The next subsection presents the case of WSO2 and the details of SG1.

6.2.2 Case Study II: Secondary mover to the industry

6.2.2.1 The returned entrepreneur: SG1

SG1 is a Sri Lankan citizen born in 1965. After completing secondary education in Sri Lanka, he immigrated to the U.S.A. in the early 1980s for his tertiary education. He earned his B.Sc. in Applied Mathematics and Computer Science degree in 1988 from Kent State University in the U.S.A. In the next year, he earned his M.Sc. in Applied Mathematics and Computer Science degree from the same university. He earned his doctorate in Computer Sciences from Purdue University, U.S.A. in 1994.

He started his career as a Visiting Professor of Purdue University in 1994 and in 1997, he joined IBM Research, New York as a research staff member. He continued his academic

career as a Visiting Professor of Polytechnic Institute of New York University while working for IBM Research.

In 2001, he permanently returned to Sri Lanka together with his family (see Section 5.4.1). Interestingly, he continued to work for IBM Research remotely staying in Sri Lanka. In 2003, he founded LSF, which is a company limited by guarantee and non-profit organization to promote OSD among young Sri Lankans. He ended his eight years' service at IBM Research in 2005, and in the same year, he started another firm WSO2, which is the first ever OSD firm in Sri Lanka.

6.2.2.2 WSO2: The Firm Founded by a Returned Entrepreneur and its Growth

WSO2 founded by SG1, is the leading innovative firm in the KSI in Sri Lanka. WSO2 was a software-product based company from its inception. WSO2 develops middleware products⁵¹ using OSD and compete, with the technology giants, IBM Corporation and Oracle Corporation in the international market. The first product introduced by WSO2 is popular as “Tungsten” which is a platform to develop applications on the internet (WSO2, 2015). At present, their product portfolio comprises of several products such as applications programming interface (API) management products and internet of things (IOT) related products.

The firm has been awarded locally and globally for its innovations in OSDs. To name a few,⁵² the awards portfolio includes the National Best Quality Software Award (NBQSA), awarded by the Sri Lankan Chapter of the British Computer Society and SD Times 100 award of SD Times of U.S.A. as the “leader in the software development industry” for several years.

WSO2 achieved a rapid growth in the global market since its incorporation in 2005. The growth can be traced in several ways. First, the number of customer transactions operated on

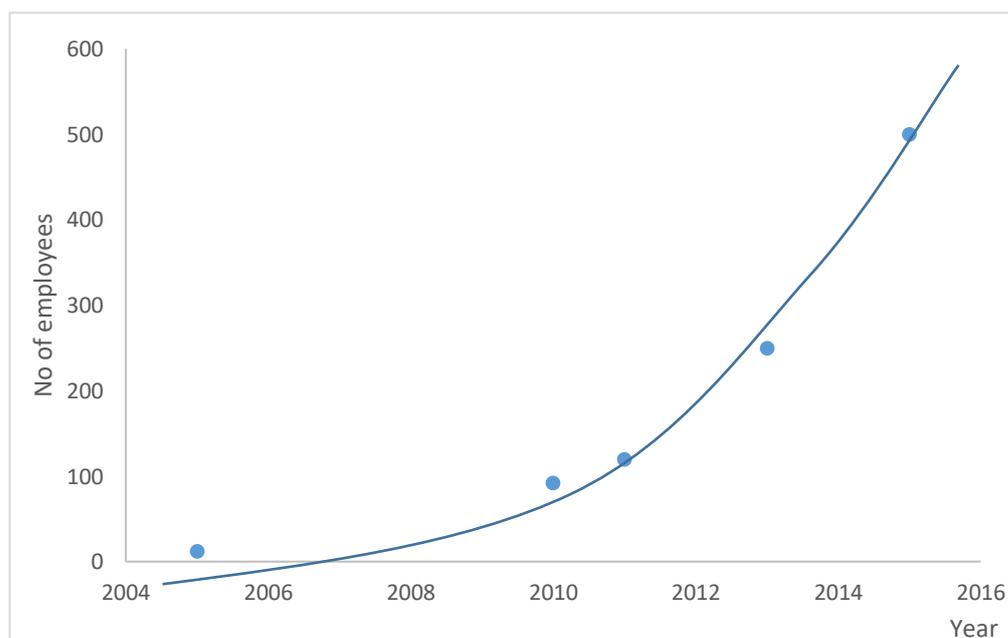
⁵¹ “an easily extensible software platform that let people build distributed applications” (Wijerathne, 2015). Also available at <https://wso2.com/blogs/thesource/2015/08/ten-years-and-flying-high/>

⁵² The list of awards received by WSO2 is presented in their website, which can be accessed through the following link: <https://wso2.com/about/awards/>. Accessed on 15/12/2014.

middleware platforms developed by WSO2 has increased from 500 billion in 2005 to 2.2 trillion transactions in 2014. WSO2 is an Opened Sourced Software (OSS) supplier. Therefore, its revenue is generated through customer subscriptions. In the last three years, customer subscriptions for the middleware products developed by WSO2 has increased significantly. According to the press releases of WSO2 (2019), the number of subscriptions in 2016 was 229. The number increased to 312 in 2017 and further to 406 subscriptions in 2018.

Second, the firm that started as a very small entity with 12 employees in 2005 has provided employment for more than 400 software and IT engineers by 2013. The rapid growth of the number of employees in the firm is depicted in Figure 6.2.

Figure 6.2: Employment Growth of WSO2, 2005-2015



Source: Author's survey data (2013); Various news releases by WSO2. Available at <https://wso2.com/about/news/>

Third, WSO2 has expanded its global footprint over the last decade. Although its activities were limited in the U.S.A. and Colombo at the inception, by now, it has established its offices in California in the U.S.A., London in U.K. and São Paulo in Brazil by covering North America, South America, Europe and Asia-Pacific regions. In addition, WSO2 serves

global multinational companies such as eBay, Boeing and British Airways, and some Sri Lankan business conglomerates such as JKH being a global player while catering to the domestic firms as well.

Fourth, WSO2 is recognized as one of the best export brands in Sri Lanka. The firm ranked at 10th place at the Brands Annual 2017 edition published by Brand Finance Lanka by suppressing most of the tea and textile and garment related export brands in Sri Lanka (Brand Finance Lanka, 2017). Subsection 6.2.3 analyzes the two case studies presented above.

6.2.3 Findings of the two case studies

The two cases, Virtusa and WSO2, have shown a rapid growth of the firms in local and global markets in the last decade. In this section, I discuss various ways in which REs contributed to the business expansion. Several elements were identified as potential advantages of the REs that contributes to business expansions. Those are, (a) establishing “global startups”⁵³; (b) use of co-worker networks to start firms; (c) export market orientation of the firms; (d) stay connected to the host country; (e) ability to raise seed capital from market sources; (f) the use of innovative ways to finance business expansions; and (g) act as knowledge transmitters. The following subsections will discuss each of these elements.

6.2.3.1 Establishing global startups

The KSI in Sri Lanka improved its international recognition as a knowledge service provider over the last few years. REs have contributed to this internationalization of the industry by establishing “global startups.” Virtusa started its operations with three engineers with the offices in Westborough, Massachusetts in the U.S.A. and a development center in Colombo, Sri Lanka. At the beginning, its US office was the basement of EM1’s house in Westborough, Massachusetts and the Sri Lankan office was a back room of his parents’ house in Colombo. Similarly, WSO2 started its operation in Sri Lanka with 12 employees in July

⁵³ Firms are identified as global startups if they involve in international business from the inception of the firm.

2005 and in the next month, the firm was officially launched at the OSCON⁵⁴ 2005 in Portland⁵⁵, Oregon, the U.S.A. Therefore, both REs have worked with employees in Sri Lanka and the U.S.A. from the inception of their firms.

This is in contrast to the strategy of traditional business firms in developing countries. Generally, locally grown firms leverage the advantages of local knowledge and protective policies in developing countries to expand its business operations in the local market. However, most of them fail to be competitive in the global market even after becoming big conglomerates in the domestic market.

6.2.3.2 Use of Co-worker Networks to Start the Firm:

The two case studies discussed above reveal that REs have collaborated with their ex-coworkers from the host country to start their firms. EM1 collaborated with DG who was his coworker at INSCI Corporation to start Virtusa in 1995. DG is a graduate of Stony Brook University, New York and had over two decades of experiences in marketing activities of various technology firms such as IBM when he joined INSCI Corporation in the early 1990s (Virtusa, 2014). Prior to establishing Virtusa in 1995, three of its co-founders,⁵⁶ EM1, EM4 and DG, were founding members and directors of the INSCI Corporation. While EM1 served as the Executive Vice President and Chief Technical Officer of INSCI Corporation, DG performed as the Executive Vice President and Chief Operating Officer. As members of the management team, both played a strategic role in making INSCI Corporation a public company in 1994 (Virtusa, 2014).

Coworkers were aware of the competencies of each other, thereby, were able to successfully launch a new business. As a coworker, DG was aware of the entrepreneurial and

⁵⁴ “OSCON is the place to gather with open source leaders and practitioners of every persuasion to exchange ideas and push the boundaries of vital open source technologies” <http://conferences.oreillynet.com/os2005/> .

⁵⁵ Extracted from a blogpost of SGI (2015).

⁵⁶ Virtusa had six co-founders at the inception in 1995. They were EM1, EM4 (EM1’s wife), EM1’s father, EM1’s mother, JG, and SG (JG’s wife).

managerial abilities of EM1. DG expressed his view on uncommon entrepreneurial ability of EM1 in an interview with the Worcester Business Journal (2012);

“My initial impression is that he was obviously a very, very talented engineer, but in addition to that, he had a level of business acumen that was uncommon, in my view, from folks that came up on the engineering side of things.”⁵⁷

The success of EM1 at INSCI created the opportunity to start a new firm with the support of DG.

The story remains the same at the inception of WSO2 as well. SG1 realized the potential of OSD, especially in the middleware development, while working with young software developers at LSF in Sri Lanka. However, to initiate the business idea, he needed a partner. He decided to join with PF, who was one of his co-workers at IBM. PF holds M.Sc. in computation from Oxford University and worked for IBM from 1997 to 2005. Prior to starting WSO2 in 2005, SG1 and PF worked together at IBM and co-created the Web Services Invocation Framework (WSIF) for IBM. In addition, SG1 briefly worked with PF on his book titled “The XML Files” (WSO2, 2013). It should be noted that middleware development needs expert knowledge on Extensible Markup Language (XML) and PF is an expert on that.

6.2.3.3 Export market orientation of the firms

REs are better positioned to access export market through the networks they have created with the host country. At the early stage, Virtusa exported more than 95% of its services to the U.S.A., which is the migrated country of EM1. For instance, in 1999, the Sri Lankan center fully catered to the U.S.A. clients such as INSCI Corporation, Unisys Corporation, Lotus Corporation and Edoc Inc. (Sunday Times, 2000, October 8). Among them, over 75%

⁵⁷ Also available at www.wbjournal.com/article/20130218/PRINTEDITION/302159982/canekeratne-leads-virtusa-into-key-role-aiding-it-transformations

of its services exported to INSCI Corporation, where EM1 was Vice President prior to establishing Virtusa.

Virtusa did not diversify export markets until it strongly established its footprints in the US market. Table 6.4 shows the market diversification of Virtusa from 2005 to 2014. Accordingly, in 2005, even after a decade of establishment, 96 percent of its sales generated from the US clients. However, by 2007, its share of sales generated from other regions, in particular from Europe, had increased significantly. The share of sales from the U.S.A. decreased to 70 percent while that from Europe accounted for 24 percent.

Table 6.4: Sales of Virtusa by Regions (Percentages), 2005-2007 and 2012-2014

Region	2005	2006	2007	2012	2013	2014
North America	96	86	74	78	75	70
Europe	3	14	26	18	20	24
Other	1	0	0	4	5	5

Source: Financial reports of Virtusa, various years.

Table 6.4 suggests two notable features of the firm: First, it indicates the export orientation of the firm. The domestic market share is negligible, compared to over 95 percent of the export revenue of the firm. Second, a larger share of the export revenue has been generated from the host country of the returned entrepreneur.

At the initiation of WSO2, SG1 targeted the global market for his business leads. Even by 2013, export earnings accounted for more than 95 percent of the total sales of WSO2. As he explained, one of the main advantages of being a returned entrepreneur is the ability to understand the foreign market correctly.⁵⁸ The U.S.A. has been the target market for technological startups including WSO2, where most of the potential clients are located. The middleware market is dominated by technology giants, namely IBM and Oracle. WSO2 competes with these giants by introducing open-source based middleware products. In other words, SG1 has tapped the market share of his ex-employer; IBM.

⁵⁸ At the interview with SG1 in 2013 at his residence in Colombo, Sri Lanka

6.2.3.4 Stay connected to the host country

The benefits of brain circulation occur when returnees strengthen the links between technology hubs in developed countries and emerging markets in developing countries. It is worth understanding how EM1 maintained a close connection with the technology hub in the U.S.A. to enhance the performances of Virtusa. As EM1 stated, outsourcing business has enabled him to carry out necessary research and development activities for its US clients at a lower cost, which reduces the risk of software development failures (Sunday Times, 2000, 8). EM1 has effectively utilized his networks with his ex-employee, INCI Corporation to enhance the export performances of Virtusa by maintaining a strong link with his host country. He realized that having connected to the technology frontier and the market is a key to thwart in the export market. After successfully having launched Virtusa in 1995, EM1 took a leave of absence for two years in 1998 and 1999, and co-founded another technology company, edocs Inc., which is a US-based company that produces electronic-account management software for MNCs (Pickering, 2003, January 11). After incorporating edocs, Virtusa became its main software development center and, later on, Virtusa mostly depended on software development projects offered by edocs (Virtusa, 2014). EM1 played a significant role as the co-founder at edocs. He was not just a founding member of edocs but also the Executive Vice President of Technology, who guided the technical direction of the firm. This clearly reflects the advantage of staying connected to the host country. If a diaspora member holds a key position in an international organization, they have the ability to influence the firm's decisions and connect the link between the technologically advanced firms in developed countries and firms in the home country.

Further, Virtusa maintained its head office in Westborough, Massachusetts as a strategic move to increase the client confidence on the firm. EM1 stated in an interview with Wharton School of University of Pennsylvania (WSUP), that security conditions in Sri Lanka during

the civil war period (1981-2009) have not been a concern for most of its clients in the U.S.A. as they dealt with the corporate head office in the U.S.A. (WSUP, 2002).

Policy makers and citizens in developed countries are highly concerned about the offshoring of business processes from developed to developing countries, even such offshoring activities generate cost benefits for the consumers and producers in developed countries. According to EM1, software engineers in Sri Lanka earned around one tenth of the salary of their US counterparts in 2002 (WSUP, 2002). Nonetheless, locating head office in the U.S.A. and listed in NASDAQ, U.S.A., Virtusa has escaped such criticisms. As he expressed, “they [clients in the U.S.A.] don’t have to feel that they are going into a foreign country” (WSUP, 2002).

Intention of SG1 to maintain his connection with the technologically advanced developed countries, in particular with the U.S.A., is reflected by the activities of WSO2, as well. Similar to Virtusa, WSO2 also maintained its head office in Mountain View, California, U.S.A. Importantly, under the guidance of SG1, WSO2 organized a conference, which is known as “WOS2Con,” to stay connected with the technologically advanced developed countries. This is the official conference organized by WSO2 to highlight various technological challenges in the digital transformation of businesses and potentials of their products to handle such challenges. From 2010 to 2017, WSO2 conducted 12 such conferences in four locations, namely, WOS2Con Asia in Colombo, WOS2Con the U.S.A. in San Francisco and WOS2Con Europe in London and Barcelona (WSO2, 2018). Out of the 12 conferences, four conferences were held in San Francisco, the U.S.A., which is the host country of SG1, whereas another four conferences have been held in Colombo, Sri Lanka. These conferences connect the technological hubs in developed countries such as the U.S.A., and facilitate the technological upgrading of firms in developing countries such as Sri Lanka.

When asked about how frequently he travels between the U.S.A. and Sri Lanka, his answer was short: “Very frequently.” Although SG1 returned permanently to Sri Lanka, these

frequent visits have helped him stay connected with his host country. Moreover, employees of WSO2 travel over 1,000 trips per year to attend such conferences and meeting, and meet their customers (WSO2, 2016).⁵⁹ These movements of employees also facilitate knowledge transfer from developed countries to Sri Lanka.

6.2.3.5 Ability to raise seed capital from market sources

The KSI is not capital-intensive compared to other industries. A small step with innovative ideas would lead to the establishment of a firm as a MNC. The historical development of the technological giants such as Microsoft, Apple and Facebook, also witnessed how initially small firms could grow. Although EM1 initiated the firm when the KSI in Sri Lanka was not known to outsiders, he managed to finance seed capital from a foreign partner that was his co-founder DG. In addition, EM1 relied on traditional non-market sources, i.e., from his parents in Sri Lanka, to finance the seed capital as well.

The experience of SG1, who entered into the industry when it was booming, was somewhat different. According to a media release by Wijeratne (2015)⁶⁰ to celebrate the 10th anniversary of WSO2, “Ten years ago, SG1 had a problem: he had an idea for a company, but not enough money.” The problems faced by SG1 at the inception of his business planning are common problems for entrepreneurs in knowledge-based industries. However, the strategies used by SG1 to overcome the financial problem was innovative in the context of Sri Lanka. SG1 chose a foreign partner, i.e., PF, as a co-founder to raise the seed capital for the business. PF’s father invested in the business.

In addition, SG1 and PF could secure a big investment as the seed capital from JC, who was recognized as the father of XML and from another angel investor (Wijeratne, 2015). It is worth noting how WSO2 successfully raised seed capital from angel investors from the U.S.A. As SG1 shared his experience with the Island newspaper;

⁵⁹ <https://wso2.com/10-years>

⁶⁰ <https://wso2.com/blogs/thesource/2015/08/ten-years-and-flying-high/>

"We started with US\$ 600,000 as seed capital to start the company. All we did was a presentation and we received the money. Everything was based on trust. There was no collateral, nor legal binding on personal assets" (The Island, 2011, June 5).

In this case, information asymmetry did not occur as the co-founders, SG1 and PF, and the investor, JC, were equally aware of the technology and the market potentials of the investment. Therefore, financing through angel investors was considered as an effective way to raise seed capital for technology start-ups. However, this method was new to the KSI in Sri Lanka in the mid-2000s.

6.2.3.6 Business financing through venture capitalists and angel investors

Financing of business expansion is not so easy as finding seed capital for business startups. Information asymmetry applies even at business expansions until the growth and success of the firm is become visible to the outsiders. In developed countries, innovative mechanisms such as venture capital financing is available for business financing. However, such innovative financing methods are not popular in developing countries due to less developed nature of the financial markets. However, REs tend to use venture capital financing and financing through angel investors to finance their business expansions.

It is interesting to explore how Virtusa raised capital from three venture capital firms from the U.S.A. and successfully listed in NASDAQ, U.S.A. Virtusa did not raise external funds at the early stage of its business. In the first five years Virtusa grew up to a large-scale business in Sri Lanka by leveraging internally generated funds. In 1999, the company employed 320 employees in total in which 250 software engineers were stationed in Sri Lanka. The firm was valued at US\$ 76 million in 2000, before it raised its first external funds from Sigma Partners, a US-based venture capital firm (De Silva, 2000). In year 2000, the firm received US\$ 13.5 million from Sigma Partners in exchange of 15 ownerships of the firm. In 2001, Virtusa received the second round of venture capital funds, which amounted to US\$ 22 million from two venture capitalists, namely, JAFCO Ventures and Charles River Ventures. In 2007,

Virtusa listed in NASDAQ stock market by offering 4,400,000 shares valued at US\$14 per share.

EM1 effectively utilized venture capital funds at the early stage of Virtusa's development while maintaining the control over the firm even after several rounds of external fund raising. In the process of raising venture capital from US venture capitalists, the credibility of the entrepreneur mattered. For instance, before JAFCO Ventures and Charles River invested money in Virtusa, they had closely monitored the performance of EM1 during his tenure as the Vice President of Edoc Inc. (Pickering, 2003, January 11). When skilled migrants work in international companies, it creates an opportunity to show their talent to the industry people. Thus, EM1's reputation and credible track record have secured the venture capital investment in Virtusa.

Moreover, one of the representatives of Sigma Partners mentioned its investment strategy in a recent newspaper interview as follows: "We are keen on investing in companies that have a strong product base and work on a model with front-end in the U.S.A. and back-end in India like Virtusa" (The Financial Express, 2004, March 1).⁶¹ This highlights the importance of registering as a US-based firm in order to raise capital from US-based venture capitalists. The same was highlighted by EM1 in WSUP (2002) as a strategy to gain customer confidence as a US firm has paid off in fund raising as well.

WSO2 led by SG1 also successfully raised US\$ 40.5 million venture capital funds within ten years of its inception. First, Intel Capital⁶² invested US\$ 4 million in 2006, the year when Sri Lanka was at the height of its civil war. The reasons for Intel Capital to invest in WSO2 despite such geographical risk factors are highlighted in the Success Stories Book of Intel as follows:

⁶¹ Also available at <http://archive.financialexpress.com/news/globespan-capital-sigma-partners-to-invest-11-million-in-virtusa-corp/100248>

⁶² This is the venture capital company of the Intel Corporation.

“They [investor] believed in the value of the product, the expertise of the CEO, and the potential of the company’s unique open source marketing approach” (Intel, 2014, p. 19).

Intel Capital considered the expertise of the CEO in addition to the value of the product and the potential of the products in the market. The investment of Intel Capital in WSO2 highlights two facts in relation to our discussion. First, the track records of the REs are important to secure investment from international venture capitalists. The investment came in less than one year of the initiation of WSO2. Therefore, it is reasonable to suggest that not only the performances of the CEO of WSO2 had mattered, but also his previous working experiences at the technology giant, IBM, should have counted. Second, venture capital funds help to overcome information asymmetries in the capital markets. Intel Capital as a leading high-tech company should have the expert knowledge to evaluate the value of the product as well as “potential of the company’s unique marketing approach” (Intel, 2014, p. 19). Therefore, the problem of information asymmetry has not arisen.

Then in 2011, US\$ 6.5 million was invested by Quest Software and Intel Capital by fueling the growth process of WSO2 and followed by a US\$ 10 million investment from Toba Capital, Cisco and Intel Capital in 2013. Finally, Pacific System Control Technology Incorporations and Toba Capital invested US\$ 20 million in 2015.

REs have relied on financing through new instruments such as venture capital financing, which is not popular in Sri Lanka. Both firms have successfully raised venture capital funds from foreign sources. Therefore, business expansions of the firms founded by REs have not been affected by capital market imperfections in Sri Lanka.

6.2.3.7 Act as Knowledge Transmitters:

REs can act as knowledge transmitters to transfer knowledge from technology hubs in developed countries to developing countries. The knowledge may be in the form of new technological innovations, new organizational innovations and institutional innovations.

By the early 1990s, many IT firms in the Silicon Valley were busy with finding solutions to the Y2K problem. In the endeavor to overcome the Y2K problem, a new business concept called “Business platforming” emerged. business platforming means connecting technologically advanced countries and developing economies to work on the same project.” Virtusa was born as an outcome of this successful innovation of the “business platforming.” As the returned entrepreneur EM1, who is the founder cum CEO of the Virtusa, reflects that “the inspiration for the business came from a deep passion and desire to accelerate software development by applying platforming principles executed through globally distributed software engineering teams” (Tremblay, 2011, October 24).⁶³

At its inception, Virtusa mainly focused on IT services to capitalize the advantages of platforming principles and the highly educated workforce in Sri Lanka. According to EM1⁶⁴ “it was a large, untapped resource pool” (WSUP, 2002). The “business platforming” was a common technique applied by investors from India and China. In 1995, however, it was an innovation in the context of the KSI in Sri Lanka. Thus, the concept of business platforming and the new way of doing business contributed to the industry growth in Sri Lanka by creating imitators and spinoffs of Virtusa. For instance, among the ten stories highlighted in Chapter 5 as successful REs, two REs had worked for Virtusa before they become entrepreneurs. They imitated the business platforming introduced by EM1 to thrive in the KSI in Sri Lanka.

EM1 has played a key role in introducing institutional know-how to the KSI in Sri Lanka. Among many, he introduced a flat management hierarchy within Virtusa in contrast to hierarchical organizational structures with several layers in the other industries in Sri Lanka. The corporate culture in Sri Lanka is formal and hierarchical due to the influence of over 100

⁶³ An interview with daily news writer Bob Tremblay on October 24,2011. Also available at <http://www.metrowestdailynews.com/article/20111024/News/310249932> (retrieved on May 16, 2014)

⁶⁴ Available at <http://knowledge.wharton.upenn.edu/article/in-a-global-economy-competition-among-bpo-rivals-heats-up/>

years of British colonial practices. However, the flat organizations does not have several layers, hence facilitates communications between the top layer and the bottom layer. An ex-employee⁶⁵ of Virtusa, who worked as a software engineer from 2005 to 2007 (Virtusa's workforce in Sri Lanka was about 800 employees during the period), revealed his experience about flat management hierarchy of the company; "I could approach EM1 directly for any matter I encountered, and it was thrilled to call our CEO by his name." However, by 2013, the firm had a matrix organization structure due to the large workforce of over 2500 employees. Yet, the matrix structure had very few layers compared to traditional corporations in Sri Lanka.

In addition, EM1 introduced a purely performances-based evaluation system to the employees. Therefore, two employees at the same rank would earn significantly different salaries based on their performances.⁶⁶ Although it was new to corporations in Sri Lanka in the mid-1990s, at present, this is a common culture of firms operating in the KSI.

SG1 contributed immensely to imparting new knowledge on OSD in Sri Lanka through LSF. OSD was at a development stage even in technological hubs such as Silicon Valley when it was first introduced to Sri Lanka in 2003. As the founder of LSF, SG1 played a key role in disseminating the OSD knowledge especially among engineering undergraduates of the country. Since its formation, LSF has been the catalyst to produce open source developers to the KSI in Sri Lanka. The contribution he made to upgrade the OSD in a developing country like Sri Lanka secured him a director position in the Open Source Initiative⁶⁷ from 2005 to 2007. In addition, WSO2con is a flagship event that disseminates new knowledge among firms in the KSI in Sri Lanka.

⁶⁵ Through a telephone interview with the respondent on 13/09/2013.

⁶⁶ At the interview with General Manager of Virtusa, at the Virtusa office in Colombo, Sri Lanka.

⁶⁷ "The Open Source Initiative (OSI) is a global non-profit organization focused on promoting and protecting open source software, development and communities" (OSI, 2014) Also available at <http://opensource.org/>

In this section I have analyzed the ways in which REs' advantage contributes to the business expansions and industry growth in the home country by employing two case studies of REs founded firms, namely, Virtusa and WSO2, in the KSI in Sri Lanka. These two cases suggest interesting channels that helped REs expand their businesses from very small-scale start-ups to large scale businesses.

REs, irrespective of the growth stage of the industry, are better positioned to access foreign market, raise capital from foreign sources and to transfer knowledge from technologically advanced host countries to home countries.

6.3 Effects of REs Advantage on Growth of the KSI

The KSI in Sri Lanka has achieved an impressive growth over the last decade (see Chapter 3 for details). As discussed in the previous section, REs' advantage has contributed to the business expansions in many ways. However, export orientation, ability to raise seed capital from market sources, using venture capital financing and financing through angel investors are not specific features for the firms founded by REs. Therefore, in this section, I compare the export performances, business financing and diffusion of institutional know-how of locally grown firms and those of REs founded firms.

6.3.1 Export performances

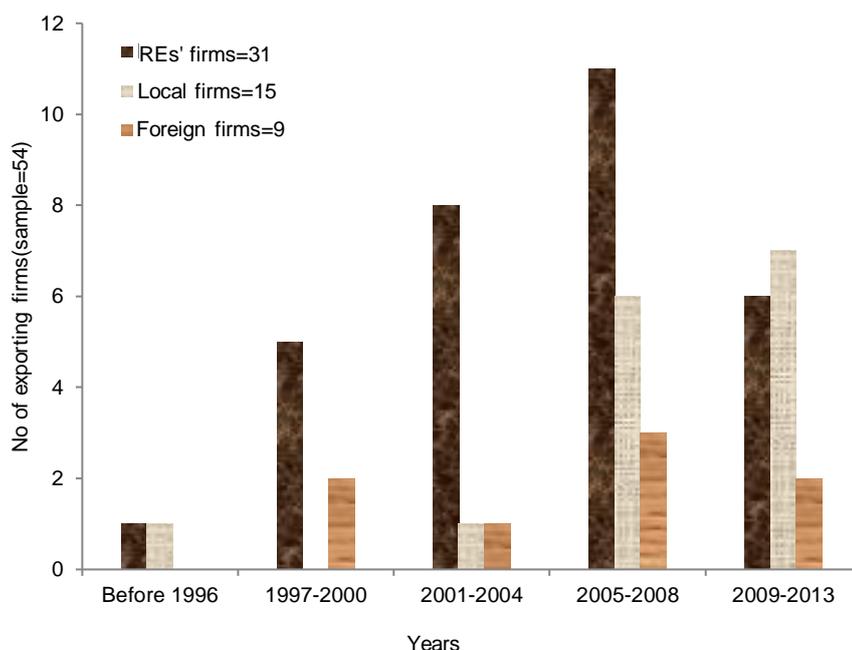
This subsection compares the export performances of REs' firms and local firms.

Export performances of the KSI is remarkable, as highlighted in Chapter Three. Surprisingly, 39 firms out of the surveyed 61 firms started as international businesses from the day of incorporation. In addition, 30 firms fully cater to the international markets.

Figure 6.3 shows an increasing number of firms in the export market that are classified as REs' firms, local firms, and foreign firms. Accordingly, in the sample, 31 exporting firms are REs' firms, whereas 15 are local firms, and nine are foreign firms. Seven firms fully cater to the local market. Until 2005, over 38 of exporting firms were REs' firms. Later, the percentage of local firms has dramatically increased from 11 prior to 2005 to 28 percent in

2013. Therefore, as indicated in the figure, REs' firms contributed to the internationalization of the industry from 1995 to 2005, and the local firms contributed to increasing the export propensity at the later stage.

Figure 6.3: Exporting Firms in the KSI in Sri Lanka by Ownership, 1996-2013



Note: Ownership type (a) as referred in Table 2
 Source: Author's survey data (2013).

Table 6.5 presents the estimated results of export market intensities for equations (4.16), (4.17) and (4.18) in columns 4(I), 4(II) and 4(III), respectively. In addition, export client intensities estimated for equations (4.19), (4.20) and (4.21) are also presented in columns 5(I), 5(II) and 5(III), respectively in Table 6.5. Table 6.6 presents the estimated results of exporters from the beginning and exporter status. The estimated results of equations (4.22), (4.23) and (4.24) are presented in columns 6(I), 6(II) and 6(III), respectively, in Table 6.6. Moreover, columns 7(I), 7(II) and 7(III) of Table 6.6 show the estimated results of equations (4.25), (4.26) and (4.27), respectively. The reported t-statistics in the parenthesis in Tables 6.5 and 6.6 are based on robust standard errors. All the models in Table 6.5 successfully passed the overall F test, whereas the models in Table 6.6 tested using F test and Hosmer-Lemeshow chi² test.

Table 6.5: Determinants of Export Market Intensity and Export Client Intensity

Dependent variables	Model 4: Export market intensity			Model 5: Export client intensity		
	4(I)	4(II)	4(III)	5(I)	5(II)	5(III)
<u>Independent variables</u>						
Firm size (log of workforce)	7.376 (0.943)	9.220 (1.263)	9.189 (1.238)	7.556 (0.915)	9.134 (1.180)	10.65 (1.359)
Firm age	-3.407** (-2.296)	-3.564** (-2.417)	-3.652*** (-2.968)	-3.386** (-2.098)	-3.514** (-2.198)	-3.679*** (-2.729)
Pure-product based firm	-2.251 (-0.124)	-4.669 (-0.251)	8.858 (0.485)	3.178 (0.166)	0.672 (0.0345)	14.65 (0.754)
Pure-project based firm	16.39 (0.765)	17.51 (0.853)	20.49 (1.013)	23.74 (1.041)	24.46 (1.129)	28.42 (1.304)
MNCs (yes=1)	115.0*** (3.946)	102.1*** (3.753)	91.79*** (3.594)	117.2*** (3.834)	105.2*** (3.708)	96.21*** (3.624)
Presence of foreign entrepreneur (yes=1)	25.45 (1.346)	38.70** (2.023)	23.17 (1.293)	27.88 (1.401)	40.63** (2.023)	25.27 (1.338)
Return entrepreneur (Presence of REs =1)	40.43** (2.359)			38.35** (2.112)		
Return ratio (Ratio of REs)		50.73** (2.592)			50.36** (2.448)	
Age of the CEO			0.319 (0.343)			0.0832 (0.0816)
Gender of the CEO (male=1)			8.883 (0.514)			6.618 (0.349)
CEO has foreign education only (yes=1)			31.15 (1.018)			34.36 (1.061)
CEO has foreign working experience only (yes=1)			94.10*** (3.823)			97.43*** (3.569)
CEO has studied and worked abroad (yes=1)			33.01** (2.252)			29.15* (1.833)
Constant	27.54 (0.913)	23.58 (0.776)	-2.511 (-0.0678)	20.67 (0.650)	16.58 (0.519)	-2.273 (-0.0565)
Sigma	51.18*** (7.883)	51.10*** (7.906)	46.38*** (7.986)	54.78*** (8.445)	54.38*** (8.307)	50.04*** (8.501)
Probability>chi2	0.00	0.00	0.00	0.00	0.00	0.00
Observations	61	61	58	61	61	58
Left/right censored outcomes	7/20	7/20	6/19	7/20	7/20	6/19

Notes: Estimated results of equations (4.16), (4.17) and (4.18) are presented in columns, 4(I), 4(II) and 4(III), respectively, whereas equations (4.19), (4.20) and (4.21) are presented in columns 5(I), 5(II) and 5(III), respectively. Numbers in parentheses are t-statistics that based on the robust standard errors. ***, **, * indicate the statistical significance at the 1%, 5% and 10%, respectively.

Source: Author's survey data (2013).

Table 6.6: Determinants of Exporter from the Beginning and Exporter Status

Dependent variables	Model 6: Exporter from the beginning			Model 7: Exporter status		
	6(I)	6(II)	6(III)	7(I)	7(II)	7(III)
<u>Independent variables</u>						
Firm size (log of workforce)	0.118** (2.027)	0.128** (2.305)	0.0919 (1.450)	-0.0324 (-0.571)	-0.00377 (-0.0679)	0.0265 (0.552)
Firm age	-0.050*** (-3.326)	-0.050*** (-3.254)	-0.040** (-2.505)	-0.0249** (-2.438)	-0.0247** (-2.019)	-0.0387** (-1.992)
Pure-product based firm	-0.134 (-0.939)	-0.134 (-0.940)	-0.198 (-1.214)	-0.148 (-0.766)	-0.170 (-0.911)	0.0327 (0.222)
Pure-project based firm	0.187 (1.372)	0.189 (1.415)	0.136 (0.907)	0.0745 (0.405)	0.0846 (0.451)	0.309* (1.896)
MNCs (yes=1)	0.468*** (3.859)	0.443*** (3.591)	0.437*** (3.682)	0.861*** (4.622)	0.807*** (4.429)	
Presence of foreign entrepreneur (yes=1)	-0.157 (-1.065)	-0.0430 (-0.298)	-0.205 (-1.244)	0.174 (0.996)	0.305* (1.681)	0.324** (2.259)
Return entrepreneur (Presence of REs =1)	0.274** (2.197)			0.437** (2.258)		
Return ratio (Ratio of REs)		0.253* (1.704)			0.438** (2.119)	
Age of the CEO			-0.00135 (-0.174)			0.0128 (1.620)
Gender of the CEO (male=1)			0.387 (1.378)			-0.171 (-0.888)
CEO has foreign education only (yes=1)			0.232* (1.718)			0.413** (2.246)
CEO has foreign working experience only (yes=1)			0.192 (1.347)			0.772*** (3.103)
CEO has studied and worked abroad (yes=1)			0.380*** (2.826)			0.384*** (3.344)
Probability>chi2	0.01	0.01	0.04	0.00	0.00	0.01
Observations	61	61	58	61	61	58
Hosmer-Lemeshow chi2	0.90	0.86	0.91	0.28	0.70	0.23

Notes: Estimated results of equations (4.22), (4.23) and (4.24) are presented in columns 6(I), 6(II) and 6(III), respectively, whereas equations (4.25), (4.26) and (4.27) are presented in columns 7(I), 7(II) and 7(III), respectively. Numbers in parentheses are t-statistics that based on the robust standard errors. ***, **, * indicate the statistical significance at the 1%, 5% and 10%, respectively.

Source: Author's survey data (2013).

Younger firms have a higher export intensity (both market and clients) as witnessed by highly significant and negative coefficient of the *firm_age* across the models in Table 6.5.

Moreover, as indicated in Table 6.6, younger firms have a higher probability of starting as exporting entities. Highly significant and negative coefficient of the *firm_age* in columns 7(I), 7(II) and 7(III) (Model 7) indicate that the younger firms have a higher probability to generate total sales through exports compared to the older firms. In addition, an increasing trend of BPO and KPO has generated more exporting opportunities for newcomers, which was not available for the entrepreneurs in the KSI in the early 1990s and before. Moreover, growing opportunities in the mobile application market, easy access to internet resources such as cloud computing, and greater flexibilities in online transactions have made exporting easier than before.

In columns 6(I), 6(II) and 6(III), positive and highly significant coefficients of the *firm_size* suggest that larger firms have a higher probability of starting as exporting entities. Except in those models, firm size is not a significant determinant of export performances of knowledge services as indicated by the insignificant *firm_size* variable in Models 4,5 and 7. In the case of firms, who are predominantly involved in the outsourcing of standardized services such as call center operations and the processing of documents, size may be a critical factor to access the market. Therefore, larger firms should be able to become exporters from the beginning if involved in the knowledge services, which have the advantage of scale economies. However, for innovative firms with their own software products, size may not be a critical factor.

In Sri Lanka, the KSI largely caters to niche markets and high value-added operation due to lack of skilled people in large numbers. During my preliminary fieldwork in Sri Lanka, most of the resource persons highlighted that Sri Lanka cannot compete with India in terms of *numbers*; however, it might be possible to compete in terms of *quality*. If a foreign client wants to establish their back-office operations with 2,000 heads, Sri Lanka is not in a position to attract that investment because it is not possible to find 2,000 qualified people in a short

period of time. However, Sri Lanka is much favored than India attracting investments that requires a few but high caliber employees to deliver high value products/services.

I employ two control variables, namely, *MNCs* and *presence_of_a_foreign_entrepreneur*, in Models 4 to 7. The former refers to the branches and subsidiaries of foreign MNCs, whereas the latter refers to the presence of foreign investors such as angel investors or venture capitalists in a firm. As expected, positive and highly significant coefficients of the *MNCs* variable in Table 6.5 shows the advantage of those firms in terms of export intensity. Similarly, these firms have a higher probability to become exporters from the beginning and generate total sales from exports as reflected by highly significant and positive coefficients of *MNCs* in Table 6.6. In contrast, the coefficient of the *presence_of_a_foreign_entrepreneur* is not significant in several models in Tables 6.5 and 6.6. However, in columns 4(II), 5(II) and 7(II), the variable has a positive and significant effect on the export performance of a firm.

I test the significance of the dummy variable *return_ent* in Table 6.5 and 6.6. The variable *return_ent* has a positive and significant effect on export market intensity of a firm as indicated in (see Column 4(I) in Table 6.5), in which the presence of a returned entrepreneur enhances the export market intensity by over 40 percent when all the other variables are held constant. The coefficient of *return_ent* in Column 5(I) also has a similar effect on the export client intensity of a firm. In addition, REs' firms have a higher probability of starting as exporting firms, as well. This is indicated by the positive and highly significant coefficient of *return_ent* in Column 6(I). Moreover, a firm has a higher probability to generate total sales through exports if at least one of their directors is a returned entrepreneur. More precisely, the presence of the returned entrepreneur increases the probability of generating total sales from foreign sources by 44 points compared to the reference category of local entrepreneurs. Therefore, based on the four indicators I employ to measure the export performance of firms, the result of the analysis fails to reject the *Hypothesis 3.1* that the presence of a returned entrepreneur enhances the export performance of knowledge services firms in Sri Lanka.

I test the significance of the coefficient of *return_ratio* in tables 6.5 and 6.6. The variable *return_ratio* also has a positive and significant impact on the export market intensity and export client intensity of the firms as indicated by equations 4(II) and 5(II) in Table 6.5. Accordingly, a higher ratio of REs in the director board increases the export market and client intensities of the knowledge services firms. As per the findings presented in columns 6(II) and 7(II) in Table 6.6, firms with higher representation of REs in the management board have a higher probability to become an exporter from the beginning and generate total sales through exports. All the four indicators of export performance support the claim that firms with a higher representation of REs in the director board have greater export performance. Therefore, the result of the analysis fails to reject the *Hypothesis 3.2* presented in Chapter Four.

Both *return_ent* and *return_ratio* support that the local entrepreneurs underperform than REs in terms of export performance. In order to test the significance of transnational capital on export performances, I analyze the determinants of export performances by employing the estimated results of equations (4.18), (4.21), (4.24) and (4.27). I focus on the coefficients of the *characteristics_CEO* variable, which include age of CEO, gender of CEO and transnational capital of CEO.

Transnational capital (see Section 5.6) accrued by CEOs through foreign working experiences and foreign education have helped firms in the KSI achieve more superior export performance than the reference category of local counterparts. The reference category represents the locally grown firms where the CEO is not a returned skilled migrant. If the CEO of a firm possesses both working experiences and overseas education, the firm tends to have higher export market intensity and export client intensity compared to the reference category. This is reflected by the positive, and significant coefficients of *CEO who has studied and worked abroad* in columns 4(III) and 5(III) in Table 6.5. Similarly, if the CEO possesses both qualifications, these firms have a higher probability to start as exporting firms

and also to generate total sales through exports (see columns 6(III) and 7(III) in Table 6.6). Higher education in a developed country enhances technical know-how, knowledge of new ways of doing things. If the same person continues to work in a developed country, added-values through years of experience enhances business networking, in particular. Therefore, both foreign education and working experience enhance the transnational capital of the skilled migrants.

It should be noted that of majority of returned CEOs have both working experiences and overseas education. Therefore, if the CEO has a single qualification; working experiences or education abroad, analysis tends to produce mix results. As reflected in Column 4(III), if the CEO possesses only overseas working experience, those firms tend to have a higher export market intensity compared to the reference category whereas having only overseas education does not have a significant effect on the same. The result is the same in the case of export client intensity in Model (5-c). If a skilled migrant has a chance to work in a developed country, it opens up many ways for networking and effective business relationships. However, a skilled migrant who returned after his/her studies might not have such accumulated business networks. However, in Column 6(III) the findings are contradictory to the columns 4(III) and 5(III). If the CEO possesses only foreign educational qualification, those firms have a higher probability to become exporters from the beginning. In the Column 7(III), all the three coefficients related to overseas working experience and education are positive and highly significant indicating a strong effect on exporter status.

The above analysis convincingly supports the claim that the export performance of REs' firms dominates that of locally grown firms due to the accumulated transnational capital. Therefore, the results of the analyses fail to reject the *Hypothesis 3.3* that the transnational capital accrued by the REs have enhanced the export performances of knowledge services firms.

6.3.2 Business financing

Table 6.7 shows the sources of business financing of the responding firms. Personal savings have predominantly been used to finance the seed capital by the entrepreneurs in the KSI in Sri Lanka. According to Nichter and Goldmark (2009), this is a typical way of financing seed capital by business firms across the globe, which is not different in Sri Lanka as well. For instance, a survey on Sri Lankan startups revealed that nearly 70 percent of the sample of 225 entrepreneurs have used non-market sources to finance the seed capital of their startups (SLASCOME, 2016).

Table 6.7: Sources of Business Financing by Knowledge Services Firms (sample=61)

Source of financing	Seed Capital Financing (percentages)			Financing of Business Expansions (percentages)		
	Local Sources	Foreign Sources	Sub-total (a)	Local Sources	Foreign Sources	Sub-total (b)
Savings	51	33	84	n.a	n.a	n.a
Support from relatives	16	5	21	2	0	2
Parent company financing	8	11	19	7	13	20
Business angels	2	7	8	5	15	20
Formal financial sector	5	0	5	13	0	13
Venture capital finance	2	0	2	0	3	3
Retained profit	n.a	n.a	n.a	30		30

Note: The numbers in the cell represent the percentage of firms that have used such services. The total does not sum up to 100 as the responding firms have used multiple financing sources.

Source: Author's survey data (2013).

About 30 percent of the responding firms have utilized retained profits for the financing of business expansion. This implies three aspects of the industry. First, the use of retained profit shows the protective nature of raising capital. Although there are cost-effective ways for business financing such as equity financing, it might influence the ownership structure of the firm. Moreover, raising external funds is not easy because of the capital market imperfections as discussed in Chapter 2. Second, the use of retained profits indicates the profitability of the industry. The skill-intensive nature of the industry has made it easy to expand the operation simply increasing the employment. Finally, like Beck and Demirguc-Kunt (2006) explained,

profit reinvestment reflects the investor confidence on intellectual property rights and the legal system of the country. Therefore, it further reflects the growth prospect of the industry, as well.

Among the various sources that have been utilized as the financing sources, savings brought back by the entrepreneurs was the common source of financing. Although the savings brought back by the entrepreneurs solves the capital market imperfection to a certain extent, the striking number is the business financing through foreign angel investors (business angels). The Silicon Valley model of business financing (business angels and venture capital financing) is not well-pronounced in developing countries. However, 29 percent of the responding firms have accessed to business angels in which 76 percent are from foreign sources. Nevertheless, venture capital financing remains unattractive for the knowledge services firms in the KSI, and this may be due to the emerging nature of the venture capital industry in the country.⁶⁸

Table 6.7 indicates that firms in the KSI have utilized advanced financial tools such as business angels and venture capital financing to overcome the market imperfection in the financial sector of Sri Lanka. However, in order to assess the advantage of REs in raising capital from foreign sources, I estimate Model 8 (equations (4.28), (4.29) and (4.30)) and Model 9 (equations (4.31), (4.32) and (4.33)) presented in Chapter Four. Table 6.8 reports the estimated marginal effects of the regressors together with t-statistics, which are based on robust standard errors. The columns 8(I), 8(II) and 8(III) present the estimated results of equations (4.28), (4.29) and (4.30), respectively. In addition, equations (4.31), (4.32) and (4.33) are presented columns 9(I), 9(II) and 9(III), respectively. All models successfully passed the overall specification test (the F-test) and Hosmer-Lemeshow specification test, except in Column 9(I).

⁶⁸ KSI in Sri Lanka achieved a rapid growth in the last decade. However, venture capital firms have not such a rapid growth. I found only very few venture capital firms in Sri Lanka in 2013, and the existing firms also were at early stage of their business.

Table 6.8: Determinants of Accessing Foreign Capital

Dependent variables	Model 8: If seed capital raised from foreign source=1			Model 9: If capital raised from foreign source=1		
	8(I)	8(II)	8(III)	9(I)	9(II)	9(III)
<u>Independent variables</u>						
Firm size (log of workforce)	0.106* (1.686)	0.135** (2.215)	0.139* (1.687)	0.0472 (0.845)	0.0770 (1.393)	0.0482 (0.628)
Firm age	0.0101 (0.969)	0.00894 (0.849)	0.0145 (1.405)	0.00721 (0.686)	0.00672 (0.598)	0.00226 (0.321)
Pure-product based firm	-0.0913 (-0.484)	-0.161 (-0.830)	0.000214 (0.00105)	-0.0535 (-0.311)	-0.153 (-0.742)	0.141 (0.788)
Pure-project based firm	0.125 (0.591)	0.128 (0.573)	0.257 (1.188)	0.0152 (0.0805)	0.0388 (0.174)	0.122 (0.644)
Presence of foreign entrepreneur (yes=1)	0.539*** (2.752)	0.627*** (3.467)	0.466*** (2.720)	0.657*** (2.759)	0.730*** (3.528)	0.615*** (3.252)
Return entrepreneur (Presence of REs =1)	0.495*** (3.076)			0.522*** (2.702)		
Return ratio (Ratio of REs)		0.781*** (3.678)			0.856*** (3.859)	
Age of the CEO			0.0109 (0.905)			0.0237** (2.539)
Gender of the CEO (male=1)			-0.316 (-1.047)			-0.258 (-1.323)
CEO has foreign education only (yes=1)			0.515** (2.125)			0.236 (1.235)
CEO has foreign working experience only (yes=1)			0.414 (1.085)			0.229 (0.644)
CEO has studied and worked abroad (yes=1)			0.743*** (4.656)			0.672*** (5.159)
Probability>chi2	0.00	0.00	0.00	0.01	0.00	0.00
Observations	61	61	58	61	61	58
Hosmer-Lemeshow chi2	0.15	0.74	0.98	0.00	0.27	0.92

Notes: Estimated results of equations (4.28), (4.29) and (4.30) are presented in columns 8(I), 8(II), 8(III), respectively, whereas equations (4.31), (4.32) and (4.33) are presented in columns 9(I), 9(II) and 9(III), respectively. Numbers in parentheses are t-statistics based on the robust standard errors and ***, **, * indicate the statistical significance at the 1%, 5% and 10%, respectively.

Source: Author's survey data (2013).

The present study extends the validity of the nexus between the firm size and the probability of raising foreign capital by expanding its scope into the foreign seed capital as well. However, columns 9(I), 9(II) and 9(III) in Table 6.8 show that there is no any

relationship between firm size and raising foreign capital, in general. Further, the presence of a foreign entrepreneur has a positive and highly significant impact on the dependent variables in models 8 and 9.

REs are not bound by the capital market imperfection in Sri Lanka. They tend to bring their own funds from abroad or try to access foreign capital. After controlling for firm age, firm size, foreign ownership and the nature of the business, REs have a higher probability to seek foreign capital sources to finance their seed capital and other financing needs compared to the local counterparts. The coefficient of *return_ent* in columns 8(I) and 9(I) are positive and highly significant. Moreover, *return_ratio* in columns 8(II) and 9(II) provide the same results. In columns 8(III) and 9(III), I test the relationship between CEOs characteristics and the probability of seeking foreign capital with special focus on the coefficient of the *characteristics_CEO* variable.

As Table 6.8 shows, CEOs who have studied and worked abroad have a higher probability to seek foreign capital, in general, and foreign seed capital, in particular, than the CEOs who have no such exposure. If the CEOs have only foreign working experiences, their ability to raise foreign capital is not significantly different from the reference category. However, if the CEOs have only overseas education, those firms have a higher probability to raise seeds capital from foreign sources than the reference category. Therefore, as a whole, findings in Table 6.8 provide strong evidence to support the hypotheses 4.1, 4.2 and 4.3.

Similarly, venture capitalists also help the KSI firms overcome the capital market imperfections in a similar way. The Sri Lankan venture capital industry is still at the infancy level compared to that of Israel, Taiwan and India. However, REs in the KSI of Sri Lanka have effectively utilized the existing venture capital market in developed countries to overcome the capital market imperfections. In addition to the institutional know-how on financing technology business such as venture capital financing, reputation that has been

gained by the REs at the global level, also enhances their ability to raise funds from the venture capitalist and angel investors.

6.3.3 Diffusion of institutional know-how

REs transfer institutional know-how from the technologically advanced developed economies to the developing economies. This may be in the form of venture capital finance, merit-based promotion, transparent corporate governance, teamwork culture and minimal hierarchy in the organizational structure (Saxenian, 2007). I test the correlation between the presence of a returned entrepreneur in a firm and application of institutional innovations using four indicators. The test results are presented in Table 6.9.

According to the test statistics, there was no significant difference between REs' firms and other firms in terms of applying institutional know-how. Both Person Chi-square test and the Fishers' Exact test provided similar results. Traditionally, the Sri Lankan corporate sector had a formal structure characterized by seniority-based promotion and hierarchical organizations, which was introduced by the colonial rulers. Therefore, locally-grown firms should have the similar type of structure and human resource management methods in their firms. However, some of the locally-grown firms have also applied institutional know-how such as an open door policy to handle employee grievances, teamwork approach for product development and project implementations, and performance-based promotion. In the meantime, some REs' firms have not applied such institutional innovations. For instance, while 28 percent of the REs' firms have applied purely performance-based approach in promoting employees, 18 percent of other firms also have applied the same human resource management principle. On the other hand, while 28 percent of other firms have not applied the same principle in promoting employees, a similar number of REs' firms also have not applied the same principle. The KSI in Sri Lanka is concentrated in Colombo and its suburbs. In addition, these firms compete to attract the limited number of skilled employees in the country. Therefore, switching jobs from one firm to another is not rare. Thus, it is reasonable to assume that the

application of these institutional innovations in locally grown firms is a result of knowledge spillover from the REs' firms and MNCs to the local firms.

Table 6.9: Relationship between Diffusion of Institutional Know-how and Presence of REs

Description		<u>Presence of a REs</u>		<u>Pearson Chi Square Test</u>		<u>Fisher's Exact Test</u>	
		No	Yes	Statistic	Probability	Two sided	one sided
Promotions of employees are purely based on performances	No	28%	26%	0.9123	0.34	0.441	0.243
	Yes	18%	28%				
Firm has a team work culture	No	16%	20%	0.0028	0.96	1	0.586
	Yes	30%	34%				
Firm has a very flat management hierarchy	No	25%	31%	0.0985	0.75	0.8	0.478
	Yes	21%	23%				
Firm applies open door policy to handle employee grievances	No	11%	10%	0.4199	0.52	0.547	0.368
	Yes	34%	44%				

Source: Author's survey data (2013).

On the other hand, REs from other developing countries (South-South migration) might not have exposed to such institutional know-how. Therefore, firms tend to apply the traditional work ethics and techniques prevailing in the corporate sector in Sri Lanka if CEOs are not endowed with such institutional know-how. Therefore, the results of the test rejects Hypothesis 5 of this research.

6.4 Chapter Summary

In this chapter, first, I analyzed the ways in which REs' advantage contributed to business expansions in the KSI in Sri Lanka using two case studies of knowledge services firms founded by two prominent REs. Second, employing the survey data of 61 firms, I compared the export performances, business financing and diffusion of institutional know-how of locally grown firms and firms founded by REs. A summary of the findings of this chapter is presented below.

The first case study on Virtusa, which is the firm founded by the returned entrepreneur EM1, is considered as an early mover firm as the firm was incorporated at the formation stage of the KSI in the mid-1990s. On the contrary, the second case study on WSO2, which is the

firm founded by the returned entrepreneur SG1, is a second mover firm as it was incorporated in 2005 when the industry was achieving a rapid growth at local and global levels. The two cases, Virtusa and WSO2, have shown a rapid growth in local and global markets in the last decade. The two case studies demonstrate several advantages of the REs that contributes to business expansions. Those were: (a) establishing “global startups”; (b) use of co-worker networks to start firms; (c) export market orientation of the firms; (d) stay connected to the host country; (e) ability to raise seed capital from market sources; (f) the use of innovative ways to finance business expansions; and (g) act as knowledge transmitters. The details are as follows.

First, REs established global startups by internationalizing the business operations at the formation stage of the industry in the mid-1990s, thereby facilitating the internationalization of the KSI at its early stage. Second, REs have effectively utilized co-worker networks to start their firms. These co-worker networks have helped the returnee firms to achieve the required seed capital and technical competencies at the start of the firm. Third, the export orientation of REs founded firms have contributed to the internationalization of the KSI in Sri Lanka. The same has influenced the growth of the industry and its international recognition as a knowledge service destination. Fourth, firms funded by REs stay connected to the technology hubs in developed countries. This connection helps firms access updated knowledge on technical know-how and their customers in developed countries. Fifth, REs have the ability to raise seed capital from *market sources* such as through angel investors and from business partners. This is significant in a situation where most of the new firms rely on *non-market sources* to finance the seed capital. Sixth, REs use innovative financial instruments such as venture capital financing to overcome capital market imperfections in Sri Lanka. Finally, these REs and their firms act as knowledge transmitters, and they transfer institutional know-how from developed countries, in particular, from the U.S.A. to Sri Lanka. These knowledge transfers facilitated business expansions of their own firms and the growth of the industry.

As highlighted above, REs' advantage has contributed to business expansions in many ways. However, export orientation, ability to raise seed capital from market sources, using venture capital financing and angel investors to finance business expansions may not be specific features for the firms founded by REs. Therefore, the export performances, business financing and the diffusion of institutional know-how were compared between locally grown firms and firms founded by REs.

I employed four indicators to measure export performance: export market intensity, export client intensity, exporters from the beginning and exporter status. The results of the regression analyses are as follows: First, REs' firms have higher export market intensity and client intensity than locally grown firms. Second, RE's firms have a higher probability of becoming a fully exporting firm compared to the locally grown firms. Additionally, REs' firms have a higher probability of growing as global firms. The advantages of the REs' firms have arisen through the accumulated transnational capital of the REs.

Then, I analyzed REs ability to access seed capital from foreign sources and access to capital from foreign sources as business financing indicators. REs have effectively utilized foreign capital market and new instruments, in particular, finance through business angels, to finance their businesses. Knowledge about new ways of financing knowledge services brought back by REs has helped to overcome capital market imperfections in the country. Few firms had access to local venture capitalists to finance their businesses. Availability of firms specialized in venture capital financing is a positive indication of the development of a supportive financial infrastructure in Sri Lanka.

Besides, the relationship between the presence of REs and the diffusion of institutional know-how was also analyzed. There was no significant difference between REs' firms and other firms in terms of applying institutional know-how such as merit-based promotion, teamwork culture, having a flat hierarchy in the organization and open-door policy to handle employee grievances.

CHAPTER 7: Conclusions

7.1 Introduction

The present study analyzed the relationship between brain circulation and industry growth with special reference to the Knowledge Services Industry (KSI) in Sri Lanka. In this study, I examined the relationship between brain circulation and industry growth by answering two sub-research questions with the help of five hypotheses and nine econometric models.

The first sub-question addresses the factors that have motivated brain circulation in the KSI in Sri Lanka with special emphasis on the temporal nature and transnational capital of returnees. A survey of RSMs was employed to find the factors that motivated the brain circulation and the temporal nature. Transnational capital of the returnees was analyzed using the survey of RSM and qualitative information on 10 successful REs in the industry. The second sub-question addresses the advantages of being a returned entrepreneur and its effects on business expansions. Two firms founded by REs' were employed for this purpose. In addition, I analyze the effect of REs advantage on industry growth using the data obtained through the Survey of Firms. Here, I compared the export performances, business financing and institutional know-how of local firms and those firms founded by REs.

The rest of this chapter is structured as follows. In Section 7.2, a summary of the main findings of the study are presented. Section 7.3 synthesizes the findings of this study and the empirical findings. A new framework to analyze the return decision of skilled migrants is presented in this section. In addition, the section discusses the advantages of REs and whether their firms perform better than locally grown firms in terms of exporting knowledge services and accessing overseas capital markets. Section 7.4 proposes the policy implications, followed by discussions on further research in Section 7.5.

7.2 Main Findings of the Study

This section presents the key findings of the study. First, I present the determinants of brain circulation, its temporal nature and transnational capital of the returnees. Second, it

discusses the ways in which REs' advantages contributed to business expansions in the KSI in Sri Lanka. Further, it compared the export performances, business financing and diffusion of institutional know-how of locally grown firms and the firms founded by REs.

Pull factors have driven the current flow of brain circulation in KSI. Yet, to a much lesser extent, push factors have influenced the return decision of skilled employees. Among the pull factors, the most common ones were socio-cultural determinants and post-war peace. Based on Chi square test, I found that the impact of four motivational factors; growing business opportunities, post-war peace, patriotic feeling and social ties, and government incentives on return decision were significantly different for REs and RSEs.

Wage premium generated for the returnees is a key determinant at the meso level. The growth of KSI has significantly motivated the return of female migrants, ethnic Sinhalese, postgraduate degree holders and employees with foreign working experiences. Importantly, a significant number of employees returned when the industry growth became visible. On the other hand, entrepreneurs returned even when industry growth was not so remarkable. Thus, it is conclusive that the industry growth is not a significant factor that motivates entrepreneurs to make the return decision.

The analysis of the determinants of entrepreneurship found that age and nationality are significant determinants of entrepreneurship. General indicators of human capital such as years of working experience and level of education failed to correctly predict the probability of a returnee becoming an entrepreneur. This indicated the importance of transnational capital in the context of brain circulation research. Accordingly, the probability of a returnee becoming an entrepreneur was higher for foreign degree holders, for returnees who have had entrepreneurial activities abroad, and for returnees whose parents are graduates. Moreover, if the return decision is motivated by the growing employment opportunities within the KSI, such returnees have a lower probability to become an entrepreneur in the KSI. Similarly, those who are motivated by the peaceful environment of the country have a lower probability

of becoming an entrepreneur. In contrast, returnees who are motivated by the growing business opportunities in the KSI were more likely to become entrepreneurs.

Brain circulation has emerged as a temporal process for entrepreneurs, whereas it is a permanent process for skilled employees. Further, returnees who have worked in an OECD country are less likely to return permanently compared to the other returnees. Moreover, returnees who had school-age children at the time of returning tend to be permanent returnees. Qualitative analyses of ten success stories of REs found that the settlement decision of a returned entrepreneur was affected by the market orientation of the business where the major clients are located, the type of products, and the importance of REs' involvement in the business process. Transitional entrepreneurship is promoted by the increased physical movements between the home country and the host country. Staying virtually in the home country has become economical and convenient, thanks to the advancement of communication technologies. Therefore, entrepreneurs tend to stay connected to the technological frontier and the customers to keep up with the rapidly changing technology and customer preferences.

The estimated transnational capital was greater for entrepreneurs in terms of the duration of overseas stay, years of foreign education and working experience abroad. Entrepreneurs tend to have stayed longer overseas compared to skilled employees. Further, REs tend to have higher educational attainments and overseas working experiences than the skilled employees. Four major types of networks were observed at the business formation of REs; co-worker networks, foreign friends, diaspora networks and kinship networks. Co-worker networks are the most commonly observed type of networking among the REs. REs have collaborated with their previous co-workers, mostly from developed countries, to start their businesses in Sri Lanka. Some REs have co-founded their businesses together with foreign friends in the host country. In general, a diaspora network is a common mode that connects the developed country and the developing economies. In Sri Lanka, however, the role of the diaspora was

not significant due to ethnic division and a lack of cooperation among the diaspora members. Kinship networks have emerged as another frequent type of networking among the founding members. Kinship networks were a prominent type of networking among the early movers in the industry.

Two case studies selected in this research, Virtusa and WSO2, have shown rapid growth in local and global markets during the last decade. The two case studies demonstrate several advantages of the REs that contribute to business expansions. Those were: (a) establishing “global startups”; (b) the use of co-worker networks to start firms; (c) export market orientation of the firms; (d) stay connected to the host country; (e) ability to raise seed capital from market sources; (f) the use of innovative ways to finance business expansions; and (g) act as knowledge transmitters. The details are as follows.

First, REs established global startups by internationalizing the business operations at the formation stage of the industry in the mid-1990s, thereby facilitating the internationalization of the KSI. Second, REs have effectively utilized co-worker networks to start their firms. These co-worker networks have helped the returnee firms achieve the required seed capital and technical competencies at the launch of the firm. Third, the export orientation of the firms founded by REs have contributed to the internationalization of KSI in Sri Lanka. The same has influenced the growth of the industry and its international recognition as a knowledge service destination. Fourth, firms funded by REs stay connected to the technology hubs in developed countries. This connection helps firms access updated knowledge on technical know-how and their customers in developed countries. Fifth, REs have the ability to raise seed capital from *market sources* such as through angel investors and from business partners. This is significant in a situation where most of the new firms relies on *non-market sources* to finance the seed capital. Sixth, REs use innovative financial instruments such as venture capital financing to overcome capital market imperfections in Sri Lanka. Finally, these REs and their firms act as knowledge transmitters, and they transfer institutional know-how from

developed countries, in particular, from the U.S.A. to Sri Lanka. These knowledge transfers facilitated business expansions of their own firms and the growth of the industry in general.

As highlighted above, REs' advantages have contributed to business expansion in many ways. However, export orientation, ability to raise seed capital from market sources, using venture capital financing and angel investors to finance business expansions may not be specific features for the firms founded by REs. Therefore, the export performances, business financing and the diffusion of institutional know-how were compared between locally grown firms and firms founded by REs. The findings of the regression results are as follows.

First, REs' firms have higher export market intensity and client intensity than locally grown firms. Second, RE's firms have a higher probability of becoming a fully exporting firm compared to the locally grown firms. Additionally, REs' firms have a higher probability of growing as global firms. The advantages of the REs' firms have arisen through the accumulated transnational capital of the REs. Similarly, REs have effectively utilized foreign capital market and new instruments, in particular, finance through business angels, to finance their businesses. Knowledge about new ways of financing knowledge services brought back by REs has helped to overcome the capital market imperfections in the country. Few firms had access to local venture capitalists to finance their businesses. Availability of firms specialized in venture capital financing is a positive indication of the development of supportive financial infrastructure in Sri Lanka. There was no significant relationship between the presence of REs and the diffusion of institutional know-how, i.e., merit-based promotion, teamwork culture, having a flat hierarchy in the organization and open-door policy to handle employee grievances in a firm.

7.3 Discussions and Syntheses

This section synthesizes the findings of this study in the context of the existing literature. First, a significant brain circulation has occurred within the KSI of Sri Lanka, in particular, since 2009. Therefore, the present study provides further empirical evidence to support the

concept of brain circulation proposed by Saxenian and others (for instances, Gaillard & Gaillard, 1998; Johnson & Regets, 1998; Saxenian & Hsu, 2001; Wickramasekara, 2003; Teferra, 2005; Kuznetsov, 2006; Faodi, 2006; Saxenian, 2007). However, as argued by opponents of this concept (Zhang, 2003; Finn, 2005; Docquier & Rapoport, 2011), brain drain is still a significant issue in most of the other sectors in Sri Lanka. Brain circulation is happening in certain industries in developing countries such as the KSI in Sri Lanka, as in the ICT industry in Taiwan, the KSI in India and the IT industry in Israel. What is common is that these are knowledge-intensive and IT-oriented industries.

Second, theoretically, return migration is explained as a negatively selected process (for instance, Yahirun, 2009; Yendaw, 2013). If the return migration is negatively selected, push factors such as assimilation issues or economic downturn in the host country become the determinants of return decisions. However, in the KSI in Sri Lanka, pull factors have significantly influenced the return decision of the skilled migrants. In contrast to the empirical findings of return migration theory, the present study found that home-country conditions have driven the brain circulation within KSI. More precisely, the return decision of the skilled migrants is positively selected.

Therefore, as Iredala et al. (2003) and Saxenian (2007) argued, macroeconomic stability is important to promote brain circulation in developing countries. However, in addition to peace and stability, the growth of KSI has been a critical success factor of brain circulation in Sri Lanka. The results also confirmed that the macroeconomic factors are necessary but not sufficient to promote brain circulation in developing countries.

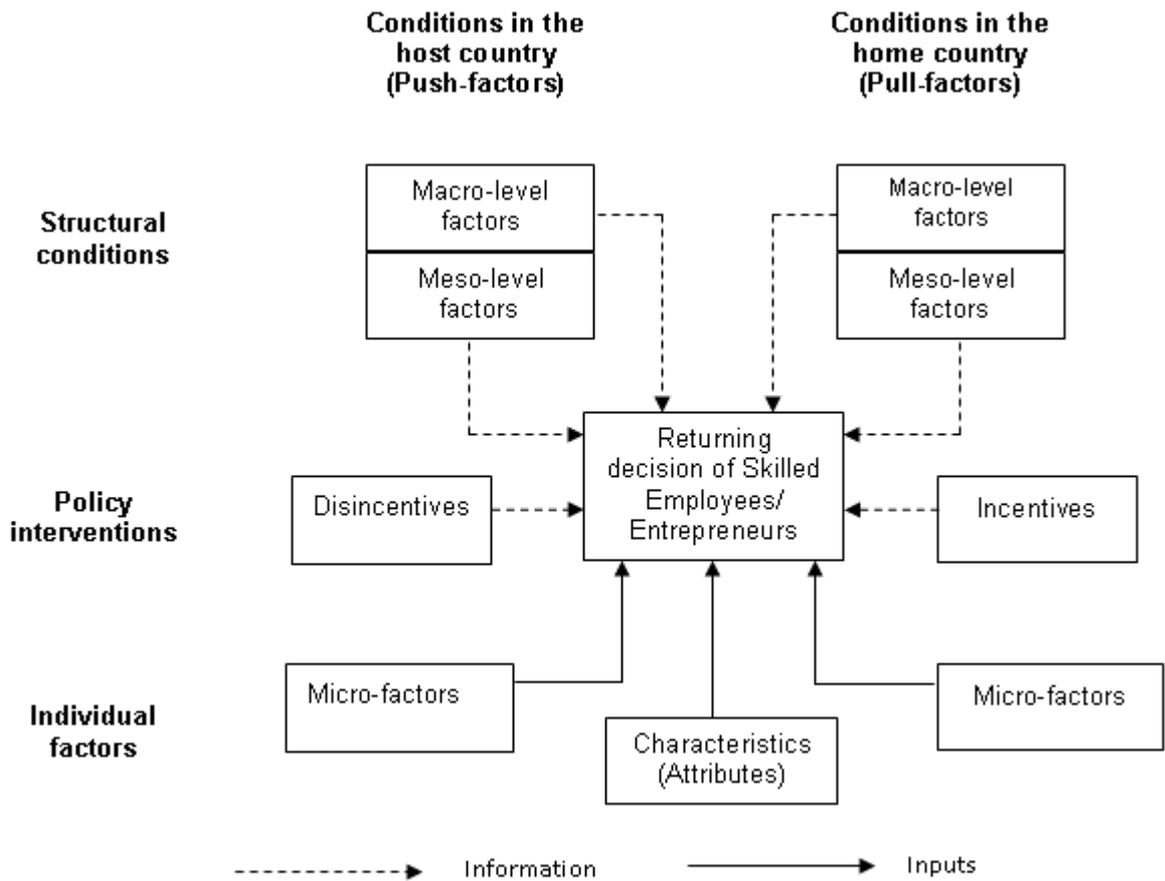
Third, as presented in the previous section, skilled employees and entrepreneurs respond to the growth of the KSI differently. Skilled employees have returned since 2009, when the growth of KSI become observable. Therefore, it is agreeable that rapidly growing industries in the home country are necessary to encourage the reverse flow of skilled employees as growing industries generate employment opportunities and a wage premium for the returning

skilled employees. Moreover, as predicted by Starc et al. (1997), highly educated and experienced returnees returned when the industry growth became visible in Sri Lanka. However, in contrast to the prediction of Starc et al. (1997), most of the highly educated and experienced entrepreneurs had returned before the industry started taking off in 2009. Also, in the absence of macro-level conditions such as peace and stability in the country. Therefore, as REs in Taiwan contributed to establishing the ICT industry (Saxenian & Shu, 2001), REs established the KSI in Sri Lanka. Factors such as industry growth and wage premium have not been the primary concerns of these REs, however. Instead, they have been motivated by the growing investment opportunities in the global BPO/KPO industry for a skill-based country like Sri Lanka.

The conceptual framework proposed by Black et al. (2004, p. 13) is not suitable to analyze the return decision of skilled migrants. In the context of brain circulation, factors determining the return decision of skilled employees and entrepreneurs are not the same. While South Korea and Jamaica tried to attract skilled employees by creating various job opportunities, Taiwan and China targeted returning entrepreneurs through their business promotion strategies. In the present study, I found that factors motivating the return decision of REs and RSEs are not the same. In addition, accumulated transnational capital was greater for REs. Moreover, the temporal nature of brain circulation was more applicable to REs. Therefore, the framework should take the differences between RSEs and REs into account.

The return decision may be affected by the conditions in the host country (push factors) or the conditions in the home country (pull factors). Both push factors and pull factors can be sub-divided into structural conditions, policy interventions, and individual factors. While structural conditions and policy interventions provide information, characteristics of the returnees and micro-level factors such as social relations provide inputs for the returnees' decision (Black et al., 2004).

Figure 7.1: Factors Determining the Return decision of Skilled Migrants



Source: Developed by author based on Black et al. (2004, p. 13) and findings.

In the conceptual framework proposed by Black et al. (2004), structural factors referred to the macro-level factors such as peace and economic stability. However, I found that meso-level factors, in particular, the growth of a particular industry, significantly affect the return decision of the skilled migrants. Therefore, structural factors should be divided into two components as macro-level and meso-level factors. Then, Black et al. (2004) did not separate the home country and the host country conditions in their framework. For instance, they identified policy interventions commonly as “incentives & disincentives.” However, in the proposed framework in Figure 7.1, I separated policy interventions as “disincentives” of a host country and “incentives” of a home country. Further, Black et al. (2004) referred to

demographic factors such as gender and age, and social factors such as family relations under the category of individual factors. I defined individual factors as micro-level factors that refer to social, cultural and family related factors. Demographic factors are defined as characteristics (attributes) of the returnee.

Fourth, some scholars recognized permanent and temporary returnees as vital segments of brain circulation (Blitz, 2005; Saxenian, 2005; Faodi, 2006). However, recent scholars have limited the scope of brain circulation to temporary returnees (Kuznetsov, 2006; Harvey, 2009; Blachford & Zanhg, 2014). Therefore, the proponents of brain circulation have provided inconsistent views regarding the return decisions of skilled migrants; whether it is permanent or temporal. I found that the temporal nature of brain circulation might be true but does not apply commonly to both skilled employees and entrepreneurs. Entrepreneurs are less likely to return permanently compared to the skilled employees since the location does not become an obstacle to their investment activities.

Fifth, findings of the literature are mixed on the effects of firm age on the export performance of a firm. Among eight studies reported by Sousa et al. (2008), which employed firm size as a determinant of export performance, four studies have found a significant positive relationship while the others have reported non-significant relationship between the two variables. In a recent study on firms across Africa, Boly et al. (2014) found that larger firms have a higher probability to become exporters and to have greater export intensity than the smaller ones. However, Boly et al. (2014) have employed a sample that includes manufacturing and construction firms as well. I argue that firm size may be a significant determinant of export performances in manufacturing and construction industries due to economies of scale and requirement of huge capital investment. However, in the service sector, and in knowledge-based industries in particular, firm size may or may not be a significant determinant of export performance.

Sixth, in China and Taiwan, scholars have found that REs underperformed compared to the local entrepreneurs due to diminished social capital of the skilled migrants (Chen, 2008; Wang, 2014). However, in the Sri Lankan KSI, kinship networks have effectively been utilized by REs to revitalize the diminishing networks in the home country. This finding contributes to the recent debates on whether the REs or local entrepreneurs perform better. Chen (2008), Wang (2014), and Obukhova et al. (2012) argued that REs underperform compared to local entrepreneurs due to lack of local social capital. However, on the contrary, local entrepreneurs underperform compared to REs firms in the KSI in Sri Lanka. Findings of this study support the arguments of Saxenian and others and reject the claim made by Chen (2008) and Obukhova et al. (2012) that REs underperform compared to their local counterparts. Moreover, I argue that transnational capital, which is added value to human capital through foreign studies, experiences, and networking (as defined in Chapter One) need to be taken into account in analyzing the effect of brain circulation. Therefore, REs' advantage in exporting the knowledge services has contributed to the recent export boom in the KSI.

Moreover, Sousa et al. (2008) also found that the service sector has been neglected in the studies related to determinants of export performance. Findings of the present analysis broadens the understanding of the determinants of export performance in service-oriented industries, as well.

Finally, large firms have easy access to seed capital from foreign sources compared to the smaller firms. A common finding in the business financing literature is that large firms have a comparative advantage over small firms in raising capital (for instance, Akoten et al., 2006). Even though there are many studies on the sources of business financing, the ability of a firm to raise foreign capital has not received much attention. In general, private companies who are listed in a share market can utilize various financial instruments to generate foreign funds. However, it is not well studied as to how non-listed private companies access foreign capital.

In conclusion, the advantage of REs in raising foreign capital has contributed to overcoming the capital market imperfections that usually hinder the industry of the knowledge-based industries.

7.4 Policy implications

Policy implications of this research are two folds. First, I propose policies to promote the return of entrepreneurs, followed by policies to promote the return of skilled employees. Brain circulation is driven by favorable conditions in the home country or pull factors. However, as highlighted in this dissertation, different policies should be drafted to promote the return of skilled employees and entrepreneurs.

Entrepreneurs in KSI returned to Sri Lanka once they observed growing business opportunities in the home country in the mid-1990s. Entrepreneurs may return with their own business ideas, voluntarily. However, instead of being passive, governments should be actively involved in this process by maintaining an active and a regular dialog with its skilled migrants. It is important to stay informed of the skilled migrants who have a potential to become entrepreneurs on possible investment opportunities in the home country. Developing countries provide special benefits for MNCs such as tax concessions as a way to attract FDIs. Similarly, developing countries can draft special investment policies to attract investments from skilled migrants.

At the formation stage of an industry, entrepreneurs are willing to accept an extra risk as they can capitalize the advantages of being an early mover to an industry. In knowledge intensive industries, cost of failure also is not so high for early movers. However, to encourage such early movers, government's role is to provide or promote investments in the industry-specific human capital and industry-specific infrastructure. The success of the KSI in Sri Lanka should be partially attributed to the early change in the ICT education in Sri Lanka such as allowing private investments in ICT education and introducing IT degrees in the mid-1980s. Industry related instruments included the enactment of Information and Intellectual

Property Right related Acts and the improvements in IT-related infrastructure. Therefore, developing country should invest in human capital and IT-related infrastructure to create favorable conditions for knowledge intensive industries. REs can should be promoted to invest in such human capital and industry-specific infrastructure at the early stage of the industry growth.

At the time industries are growing, the stock of industry-specific human capital tends to be diminished, and thereby the industry may generate wage premium for employees. The same might have happened to other industry-related inputs. However, this process would increase the cost of failures of the second movers compared to the early movers.

The KSI in Sri Lanka is facing this challenge at present. The industry is now home for world-class firms such as Intel, Virtusa, WSO2, WSN and HSBC. These global firms are equipped with lucrative office premises in Colombo and its suburbs. Due to the small workforce and limited opportunities in the tertiary-level education in Sri Lanka, a demand for quality graduates has surpassed the local supply. As a result, high caliber IT graduates sign their employment agreements, in some cases, when they are in the final year of their undergraduate studies. The consequences are two-fold. First, secondary movers to the industry have to spend a huge amount for lucrative office premises to attract talented graduates. Second, secondary movers have to be satisfied with low-skilled graduates, who fail to find an employment opportunity in a leading firm. Both consequences negatively affect business expansion in the industry. In the former case, higher investment in physical properties increases the cost of failure and in the latter, low-quality employees become a burden to innovations and subsequent growth of the firms.

The cost of failures for such secondary movers can be curtailed by promoting business incubator programs and constructing knowledge parks where REs can share common cost items such as office rent, the cost of uninterrupted electricity, and the cost of reliable internet supply. In the KSI in Sri Lanka, there are two initiatives to provide this kind of pooled

resources for entrepreneurs, namely, Orion City IT Park and Tripoli Knowledge Park. It is necessary to consider these IT-related infrastructure issues in the industrial policy of the country. Therefore, I recommend developing such knowledge parks and incubator programs, dedicated for REs.

In the context of Sri Lanka, macro-level factors such as political stability and peace were the necessary conditions to promote the returning of skilled employee. However, macro factors are not sufficient to achieve a persistent flow of skilled migrants back to the country. The present study found that RSEs in Sri Lanka are attracted by growing employment opportunities and wage premiums in the KSI. Employment opportunities and wage premiums can be generated only when the industries are growing. Therefore, governments should be actively involved in the process of disseminating information on employment opportunities in growing industries through a constant dialog with its diaspora.

Sri Lanka is in the process of relaxing its immigration laws to facilitate skilled immigrants as a measure to overcome the shortage of skilled people in some industries. However, these initiatives have created a tension among locals. Developing countries can first attract its skilled migrants to overcome skilled shortages. Simply, developing countries should keep skilled migrants informed about possible employment opportunities in the home country. In addition, as a part of the immigration policy of the country, developing country governments can relax their immigration laws on dual citizens and skilled migrants.

As highlighted in Section 7.2, highly educated and experienced skilled employees returned when KSI was experiencing a rapid growth. The returning decision of these skilled employees was more permanent and driven by growth of the KSI. Incentives in the absence of industrial growth would not attract highly educated and experienced migrants. The attracted migrants will not continue to stay in stagnated industries and isolated locations as it was the case in Jamaica. Therefore, it is not recommended to provide material or non-material benefits to encourage the return of skilled migrants.

As highlighted in this research, not only the permanent returnees, but also temporary returnees (transnational entrepreneurs) helped to achieve a beneficial brain circulation within the KSI. Nonetheless, developing countries in general aim to promote permanent types of returnees only. This is a common trend for both REs and RSEs. Therefore, it is recommended to focus on both permanent returnee-reverse brain drain as well as temporary returnees-diaspora to achieve brain circulation that would benefit developing countries.

Success stories of brain circulation is apparently discussed in relation to the technology and knowledge intensive industries. Therefore, promoting knowledge-based industries in developing countries is encouraged to achieve a sustainable return flow of skilled migrants.

7.5 Suggestions for Further Research

This section suggests areas that need to be further analyzed to better understand brain circulation in general and the relationship between brain circulation and industry growth in particular. The recent evidence on brain circulation is not diverse enough to generalize the findings. Most of the recent case studies are from a few countries such as India, China, Taiwan and Israel, and from IT or ICT related industries. The present study has extended the discussion to Sri Lanka and the KSI. However, further evidence from different countries and different industries would be helpful to validate the concept of brain circulation.

This is the first comprehensive study on industry-specific nature of brain circulation. However, the scope of this research is limited to the industry-specific nature of brain circulation. Technology and knowledge intensive nature of brain circulation is apparent in the limited literature on brain circulation. The empirical findings are limited to technology related industries such as the ICT industry in Taiwan, the IT industry in Israel and the IT/ITeS industry in India. Therefore, in future research, it would be interesting to examine differences in the patterns of brain circulation between the knowledge-intensive industries and more conventional industries such as manufacturing and agriculture.

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Appendix

Table 5A: Test Statistics for Multicollinearity and Summary Statistics of the Variables; Model 1

Variable Name	VIF*	N	M	SD
Dummy dependent variable: If returned before 2009=1, zero otherwise		125	0.34	0.48
<u>Independent variables</u>				
Age		125	30.24	6.81
De-meaned age (Age-Mean age)	3.59	125	-	6.81
Age square		125	960.50	492.60
De-meaned age square	2.43	125	46.04	120.50
Gender (Dummy variable: Male=1)	1.16	125	0.85	0.36
Ethnicity (Dummy variable: Non-Sinhalese=1)	1.15	125	0.14	0.34
Civil status (Dummy variable: Unmarried=1)	1.59	125	0.34	0.47
Nationality (Dummy variable: Sri Lankan=1)	1.46	125	0.83	0.38
Non-degree holders (Education dummy: Yes=1)	1.72	125	0.16	0.37
Maximum bachelor's degree (Education dummy: Yes=1)	1.69	125	0.52	0.50
Maximum postgraduate degree (Base category of education dummies)		125	0.32	0.47
Working experience abroad (Dummy variable: yes=1)	1.52	125	0.75	0.43
Having a school age children at the time of returning (DV: Yes=1)	1.45	125	0.22	0.41
Returnee's status by 2009 (Dummy variable: Entrepreneur=1)	1.3	125	0.14	0.34
Mean VIF	1.73			
Condition Indices	12.26			

Note: Respondents information at the time of the respondents returning to Sri Lanka, if not specifically mentioned. *Variance Inflation Factor for multicollinearity test. In order to avoid the negative consequences of multicollinearity between age and its square term, I included demeaned data (variable centering) in the model. Demean age was calculated by $\bar{x} - x_i$.

Table 5B: Test Statistics for Multicollinearity and Summary Statistics of the Variables; Model 2

Variable	VIF			N	M	SD.
	(I)	(II)	(III)			
Dummy dependent variable: If entrepreneur=1, zero otherwise				125	0.176	0.382
<u>Independent Variables</u>						
Age				125	35.312	8.568
Age square				125	1319.78	679.79
De-meaned age (Age-Mean age)	4.18	2.27	2.17	125	0.114	8.568
De-meaned age square	1.63	1.66	1.67	125	72.85	120.35
Gender (Dummy variable: Male=1)	1.17	1.17	1.16	125	0.848	0.360
Nationality (Dummy variable: Sri Lankan=1)	1.47	1.55	1.58	125	0.832	0.375
Maximum bachelor's degree (Education dummy: Yes=1)	2.51			125	0.456	0.500
Maximum postgraduate degree	2.58			125	0.408	0.493
Maximum foreign bachelor's degree (Education dummy: Yes=1)		1.37	1.38	125	0.232	0.423
Maximum foreign postgraduate degree (Education dummy: Yes=1)		1.33	1.34	125	0.272	0.446
Working experience total	3.27			125	9.662	6.976
Working experience abroad		1.8		125	3.598	3.981
Working experience in a OECD country			1.79	125	3.152	4.105
Entrepreneurial activities abroad	1.47	1.46	1.46	125	0.088	0.284
Graduate parents (If father/mother has degree or above qualifications=1)	1.13	1.13	1.13	125	0.432	0.497
Attended popular school in a major city	1.12	1.12	1.14	125	0.632	0.484
Employment opportunities (agreed=1)	1.63	1.6	1.63	125	0.632	0.484
Business opportunities (agreed=1)	2.02	2.02	2.02	125	0.648	0.479
Peaceful environment (agreed=1)	1.33	1.36	1.36	125	0.624	0.486
Patriotic feeling and social ties to home country	1.24	1.24	1.23	125	0.504	0.501
Mean VIF	1.91	1.5	1.5			
Condition Indices	18.42	15.97	15.7			

Note: Respondents information at the time of the survey, if not specifically mentioned. In order to avoid the negative consequences of multicollinearity between age and its square term, I included demeaned data (variable centering) in the model. Demean age was calculated by $\bar{x} - x_i$.

Table 5C: Test Statistics for Multicollinearity and Summary Statistics of the Variables; Model 3

Variable Name	VIF*	N	M	SD
If returned permanently=1, zero otherwise		125	0.82	0.39
<u>Independent Variables</u>				
Age		125	35.31	8.57
Age square		125	1,319.78	679.79
Demeaned age (Age-Mean age)	2.84	125	0.11	8.57
Demeaned age square	2.07	125	72.85	120.36
Gender (Dummy variable: Male=1)	1.09	125	0.85	0.36
Civil status (Dummy variable: Unmarried=1)	1.76	125	0.34	0.47
Nationality (Dummy variable: Sri Lankan=1)	1.64	125	0.83	0.38
Non-degree holders (Education dummy: Yes=1)	1.23	125	0.14	0.34
Max. bachelor's degree (Education dummy: Yes=1)	1.21	125	0.46	0.5
Max. postgraduate degree (Base category of education dummies)		125	0.41	0.49
Working experience in a OECD country (Years of experience)	1.7	125	3.15	4.11
Having a school age children at the time of returning (DV: Yes=1)	1.34	125	0.22	0.41
Returnee's status by 2013 (Dummy variable: Entrepreneur=1)	1.5	125	0.18	0.38
Mean VIF	1.64			
Condition Indices	11.87			

Note: Respondents information at the time of the survey, if not specifically mentioned. In order to avoid the negative consequences of multicollinearity between age and its square term, I included demeaned data (variable centering) in the model. Demean age was calculated by $\bar{x} - x_i$.

Table 6A: Test Statistics for Multicollinearity and Summary Statistics of the Variables; Model 4~9

Variable	N	M	SD			
<u>Dependent variables</u>						
Export market intensity	61	63.29	39.77			
Export client intensity	61	60.71	41.80			
Exporter from the beginning	61	0.328	0.473			
Exporter status	61	0.639	0.484			
Access to seed capital from foreign source	61	0.525	0.503			
Access to capital from foreign source	61	0.590	0.496			
	VIF (variance inflation factor)					
<u>Independent variables</u>	(a)	(b)	(c)			
Firm size	1.63	1.56	1.9	61	4.01	1.421
Firm age	1.25	1.25	1.42	61	9.23	7.302
Pure-product based company	1.4	1.42	1.63	61	0.344	0.479
Pure-project based company	1.56	1.56	1.6	61	0.279	0.452
Fully-foreign owned subsidiary	2.02	1.61	1.53	61	0.147	0.358
Presence of foreign entrepreneur	1.71	1.64	1.75	61	0.393	0.493
Presence of returned entrepreneur	1.49			61	0.541	0.502
Ratio of REs		1.21		61	0.345	0.379
Ratio of foreign entrepreneurs				61	0.262	0.376
Ratio of local entrepreneurs				61	0.393	0.434
Age of the CEO			1.54	58	44.31	9.179
Gender of the CEO			1.26	58	0.914	0.283
CEO has foreign education only			1.42	58	0.121	0.329
CEO has foreign working experience only			1.24	58	0.052	0.223
CEO has studied and worked abroad			1.49	58	0.465	0.503
CEO has not studied or worked abroad (reference group)				58	0.362	0.485
Mean VIF	1.58	1.46	1.53			
Condition Indices	11.26	11.09	20.28			