Abstract

Reverse brain drain (RBD) is an interesting area to look at the movement of professionals involving developed and developing countries. The basic idea of RBD is that the professionals who are intellectual elites migrated to the industrialized nations represent a potential human resources for the socioeconomic development of their home countries. Following the brain gain hypothesis, every ‘brain drain’ is a potential ‘brain gain’. However, there is inconclusive evidence on RBD that may hinder further effort to tap the skills and experiences of the talented personnel. Based on human capital theory this conceptual paper specifically aims to i) examine the meaning of reverse brain drain (RBD) and its relevant constructs such as brain drain, brain gain, brain mobility and brain exchange; ii) illustrate evidence of best practices of RBD in selected developing countries such as Korea, Taiwan, China, and India that have been successful in dealing with RBD; and iii) suggest strategies for Malaysia, who is just beginning to embark on RBD programs, in line with the goals of the New Economic Model of the country. Implications for HRD are put forth.

Stream: Comparative and cross-cultural dimensions of HRD

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Introduction

Asian countries, such as Korea, Taiwan, India, and China, have successfully transformed their “brain drain” experience to “brain gain.” Malaysia is now trying to emulate the efforts of these nations in encouraging its professionals to return from living and working abroad in a phenomenon called reverse brain drain (RBD). Following the brain gain hypothesis, every brain drain is a potential brain gain (Hunger, 2002).

An important aspect of RBD is that it involves the movement of professionals among both developed and developing countries. RBD refers to the transnational remigration of highly skilled workers or professionals from developed to less developed countries when the latter is considered to be their country of origin (Chacko, 2007; Malhotra, 2009). The term RBD emerges to explain the consequences of brain drain, which include loss to or a destructive impact on the home country of these migrants. RBD is synonymous with brain gain, an optimistic term used to denote the huge economic and social benefits for both the sending and receiving countries if proper policies and management of talents are in place in both countries (Brzozowski, 2008; Mayr & Peri, 2008; UNESCO, 2011).

Historically, the term “brain drain” was used in the 1950s to 1970s to refer to researchers, scientists, engineers, and technopreneurs (RSETs) from less developed countries, such as Korea, India, China, Taiwan, and Malaysia, as well as South American and Eastern European countries, who migrated to industrialized countries such as the United States, the United Kingdom, Australia, Germany, and Canada because of better employment opportunities (Straubhaar, 2000; Findlay, 2001; Khadria, 2002; Donald & Yan, 2005). This ongoing phenomenon is, however, has proven to be almost impossible to stop and has resulted in a new line of thinking that has gained ground over the past four decades and has significantly shifted the emphasis away from the concept of brain drain to brain gain or RBD. The basic idea of RBD is that RSETs who are intellectual and technical elites and who have
migrated to the more industrialized countries represent a potential resource for the socioeconomic development of their home countries (Hunger, 2002; Batista, Lacuesta, & Vicente, 2007). RBD began to occur in 1990s as results of professionals returning to their home countries to take advantage of the new growth and employment opportunities. Hence, many developing countries began to look at their skilled overseas diaspora as an asset that could be tapped for nation development (Hunger, 2002; Rosenzweig, 2007). Malaysia is no exception to this trend.

This paper addresses the following research questions: (1) What are the strategies adopted by countries such as Korea, Taiwan, China, and India that have been successful in attracting their RSETs through RBD, and (2) what preparations and proactive actions does Malaysia need to undertake to successfully persuade their RSETs to return? Hence, this paper aims to delineate the best practices in the above countries’ RBD programs and to formulate strategies for Malaysia in emulating the best practices of RBD in Korea, Taiwan, China, and India. This article is significant to human resource development (HRD) as it explains the roles and responsibilities of various institutions in the development of their RSETs at all stages, from planning, implementing, and sustaining them in Malaysia. The analysis is also significant as it gives insights on Malaysia’s role in dealing with the country’s professionals abroad as well as its implications to global HRD.

This article relies on literature reviews on RBD and its relevant constructs of brain drain and brain gain. In conducting the literature review, we used a variety of sources that include policy papers, journal articles, research reports, and country case studies. Various university databases were used to access these documents, such as Springer, Proquest, SAGE, Emerald, EBSCOHost, Science Direct, and Blackwell Synergy.

The article is organized as follows: First, the definitions of RBD and brain drain are given by tracing the origin of the two phenomena from an international perspective. Second,
human capital theory is discussed as the underlying theory of RBD. Third, an analysis is made of RBD in countries such as Korea, Taiwan, India, China, and Malaysia in terms of strategies for attracting professionals, including the push and pull factors. The paper continues with a review of RBD in Malaysia and initiatives undertaken by government institutions such as the Talent Corporation (TC), Ministry of Science, Technology, and Innovation (MOSTI), and other science-based organizations, as well as suggested strategies based on the experience of the selected countries. The paper ends with a conclusion and recommendations for practice in global HRD.

What are Reverse Brain Drain and Brain Drain?

RBD originated from the expression “brain drain,” which implies that the latter came into existence prior to the former. The term “brain drain” was first coined by the British Royal Society in 1960s to describe the migration of scientists, engineers, and physicians from Europe to North America (Thomas, 1968). The movement from European countries happened in two stages: The movement from Southern Europe and Eastern Europe to Western Europe and then the movement from those regions to the United States. Since then, “brain drain” has been used to refer to the general immigration of trained and talented individuals or “professionals” from the less developed to highly developed or quickly developing regions in the world. The Organization for Economic Cooperation and Development (OECD) has shown that 20 million RSETs have immigrated from developing countries to European countries (Docquier & Marfouk, 2006).

RBD refers to the return of these professionals from developed countries, such as the United States and the United Kingdom, to their home countries, such as India, China, Taiwan, Hong Kong, South Korea, Pakistan, and Malaysia, as well as many African and South American countries. Many professionals of foreign origin have been recorded in the
United States. In the early 1990s in the United States, there were approximately 900,000 RSETs, especially from India (specifically in the technology information sector), followed by China, Russia, and OECD countries. Most RSETs in the United States immigrated through the H1-B visa program. However, there was strong evidence from emigrates especially from Taiwan, India, and China to be in their reverse mode to their homeland in the decade (Wadhwa, 2009). The reverse movement means brain gain for some of the developing countries and brain drain for the western countries. It has been found that Chinese and Indian professionals who have been educated in the United States are increasingly being drawn back to their home countries due to the economic turbulence and immigration system in the United States. It has also been discovered that 60% of Indian immigrants and 90% of Chinese immigrants return to their countries of origin because of equal business opportunities. Specifically, 30% have returned due to job security, 28% have returned due to better future prospects, 25% have returned due to better education options, and 12% have returned due to better employment packages (Gupta, 2011).

According to the Director of Talent Acquisition SAP India, Anil Warrier, RBD can be broken down into three categories. First, there are those who study in a foreign country and then immediately return home upon finishing their studies. Second, there are professionals who study in a foreign country, gain 5 to 6 years of work experience, and then return to their homelands for better opportunities. Third, there are those who study in a foreign country, gain 10 to 12 years of work experience, and then choose to return home (www.research.timejobs.com).

In the Asia-Pacific region, the movement of professionals became a critical pressure point among world economic movers, such as Korea, Japan, Hong Kong, India, and China. It was found in Singapore that professionals moved from one country to another due to changes in demographic patterns such as a decline in the population (also found in Hong Kong and
Korea), a shortage of professionals or highly skilled employees, large-scale mismatch between skills possessed by the employees and required by employers, and rising costs of living (PriceWaterCoopers, 2012). It has also been shown that 55% of CEOs in the Asia-Pacific region will be increasing their efforts to recruit highly talented professionals over the next 12 months (PriceWaterCoopers, 2012). Hence, this “talent war” is interlinked with RBD, which is a new strategy to attract and retain professionals as an asset for national development.

The Human Capital Theory

The RBD can be explained by using the human capital theory, which emphasizes the potential relationship between the talent, quality, and skills of the workforce and organizational performance (Becker, 1964), which ultimately influences a nation’s development. The education system and employment practices represent investments in human capital, and the teaching and learning, as well as training and development activities, are the kind of interventions that are most likely to affect the quality of human capital in a country. Human capital, such as an individual’s talent, knowledge (tacit and explicit), and experience are key sources of a nation’s sustained competitive advantage within the global arena. Consequently, this human capital is categorized as valuable, rare, incomparable, and non-substitutable (Barney, 1991). The importance of human capital is central to the concept of RBD, whereby the loss and gain of this capital influence the socioeconomic development of the receiving country. The implications are pervasive when the RBD involves a large group of intellectual professionals who represent a potential resource for meeting the present and future demands of their home countries. Educated professionals often migrate from poor countries to rich countries to increase their standard of living and to pursue career advancement. From the perspective of the individual professionals, their rights and freedom to travel and the opportunity to be mobile are also considered to be part of their human
capital. When professionals migrate, their investments in education and work experience generate human capital for the receiving country and, at the same time, is a deficit to the human capital of their home country. However, with RBD, the homelands of the professionals reap the investments that have been made in the individual professionals.

From the macroeconomic impact of the stock and flow of talented and highly skilled professionals, there is a disparity between less developed and developed countries. The disparity is due to uneven dispersion of knowledge, with less developed countries losing the highly skilled, and thus income potential to the higher developed countries, who gain from an over-proportional income increase (Straubhaar, 2000). Thus, disparity is enlarged when brain drain restricted growth in the less developed countries and promotes it in the developed countries. The brain drain and brain mobility are intensified when more highly skilled professionals are leaving their home countries. In most cases, brain mobility brings advantages to the developed countries. The professionals’ investments in education and work experience would generate human capital to the receiving country, and at the same time it is a deficit to the human capital of their home country. In addition, brain gain is strengthening in the developed countries which received the highly skilled professional. A win-win situation for both less developed and developed countries can also take place when ‘brain exchange’ happens. There are professionals who not only migrate from less developed to developed countries, but at the same time, some of them from developed countries willing to serve for the less developed countries. In brain exchange, there is no net loss or gain of human capital for both countries as movement of human capital exists between countries. The brain exchange is being fuelled by both pulling and pushing factors of the home and receiving countries.

RBD Experience of Selected Countries

Korea
“Korea itself is a role model for the world, becoming one of the most advanced democratic societies in the span of little more than a generation. Korea can play a unique role in building a bridge to emerging nations and their stronger engagement in development partnership” (Brian, 2012, p.1).

This statement demonstrates the transformation of Korea from a developing country to a role model for the countries around them. Korea became the 7th exclusive member of the “20-50” club on June 2012, which is an indication of Koreans’ hard work. It is now the most successful country in East Asia, with a gross national income of USD20,000 per capita and a population size of 50 million (Chiou, 2012). The other 20-50 club members are the United States (1988), Japan (1987), Italy (1990), France (1990), Germany (1991), and the United Kingdom (1996). In less than half a century, Korea achieved extraordinary economic development, democratization, and social stability to emerge as the 13th largest economy in the world. The World Trade Organization has ranked Korea as world’s seventh largest exporter at a value of USD466 billion. The three biggest South Korea conglomerates, the Lucky-Goldstar Corporation or LG, Samsung, and Hyundai, are in the world’s top 100 nonfinancial transnational corporations. The achievement was a successful trademark and milestone for the Korean “can-do” spirit. South Korea is ranked 15th in the world according to nominal GDP and 12th according to purchasing power parity, and it is one of the G-20 major economies. It is a high-income developed country, with a developed market, and is a member of the Organization for Economic Cooperation and Development (OECD). South Korea is one of the Asian Tigers and is the only developed country so far to have been included in the group of the Next Eleven countries. From the early 1960s to the late 1990s, South Korea had one of the world's fastest growing economies, and it is still one of the fastest
growing developed countries today, along with Hong Kong, Singapore, and Taiwan, the other three members of Asian Tigers.

Korea is considered to be a successful economy in terms of technological catch-up, export performance, and economic development. In general, Korea’s economic platform started as early as 1962 with the first “Five-Year Economic Plan” of the military-run government. During the formative periods, Korea focused more on the human element because the country lacked natural resources, industrial facilities, sufficient land, foreign reserves, and business experience. However, through heavy and aggressive investments in education and training and the borrowing of foreign capital, Korea created a smooth road to success. For the past 60 years, human resource has been the key factor for Korea’s economic development.

There are five main industries actively involved in research and development (R&D) in Korea—primary industry, light industry, light and heavy industry, heavy industry and electronic, as well as electronic and transportation. Compared to the other OECD countries, in 2009, Korea had 236,137 researchers in mainstream industry, science, and technology. In 2001, Korea implemented a three-stage nanotechnology initiative. The first stage was from 2001 to 2005; with an investment of USD0.9 billion, the Korea Nanotechnology Research Center and the National Nano Fab Center were developed. The main purpose of these centers was to develop a basic research and educational hub. The second stage was from 2006 to 2010; with a budget of USD1.2 billion, it focused on basic research, application, and education, and the Nanotechnology Roadmap was established. The last stage is scheduled for 2011 to 2020 but without a clear budget allocation. All three stages have placed a high emphasis on the commercialization of products or services, as well as nano-manufacturing, metrology, and instrumentation. For 2001 to 2011, the total government funding for nanotechnology development in Korea was about USD2.3 billion, which was primarily
divided among seven corporations. This is a demonstration of the dedication of the government and corporate organizations to develop and establish nanotechnology advancement in Korea.

In 2001, the Korea Education Development Institute identified and implemented HRD as key strategy for regional development. Economists have long seen HRD as a connection between the national education system and long-term economic prosperity. The Korean education system is divided into four important steps: elementary, junior high school, high school, and college/university. Korean invests a large amount in education, at about 7.4% of the GNP compared to America at 2.6%, followed by Japan at 2.2% (Program for International Students Assessment or PISA, 2011). Korea’s education policy was tailored according to National Human Resource Development strategies and crafted by Korean Education Development Institute in 2001 to improve regional strategy development. Beginning in the 1950s, the Ministry of Science and Technology has developed and established links with the Economic Planning Unit, the Research and Technology Unit, and National Education Policy.

The Korean Education Policy is divided into five stages. The first stage started in the 1950s with a primary industry focus on the agricultural sector. The National Education Unit supported the policy by offering free compulsory primary education. The second stage took place from 1962 to 1971 with a focus on research and technology; it emphasized light industry and provided basic education for all Koreans, including those with disabilities. The third stage was from 1972 to 1976 with a focus on heavy industry; in addition, the government built more secondary schools, universities, and vocational schools to fulfill the future workforce demands. The fourth stage was from 1977 to 1986, when national education focused on tertiary qualification. Finally, the fifth stage began in 1990 and is focused on the knowledge industry by building creative human capital.
According to PISA (2011), the Korean primary education system is far more advanced and is unchallenged by the other OECD countries in terms of reading capability (digital and printed forms). The Korea Institute of Science and Technology nurtures high-quality scientists and engineers in R&D. The Korean education system emphasizes continuous diverse talent qualities by providing national scholarships to reduce tuition burdens, reduce private education spending, and tailor education welfare. They nurture talent in the younger generation by developing a science, technology, engineering, and mathematics (STEM) education that encourages creative thinking and enhances problem-solving skills. Korea attracts talents from abroad with three competitive values: industry support, education growth, and advanced R&D. Koreans have a strong competitive spirit against the other superpowers in their neighborhood and are adept at picking up the latest technology opportunities for future economic development, reformation, and restructuring, especially since the 1997 Asian financial crisis. The younger generation is dynamic, has received heavy technology exposure and training, and has a strong spirit of individualism (Cohen, 2001).

**Taiwan**

From 1970 to 1980, Taiwan spent millions of dollars to educate high potential graduates to help with developing the nation. However, only 20% of these students in field of science and technology returned to Taiwan when they completed their undergraduate degrees (Chan, 2000). This percentage included the 16.2% who returned after graduation in 1977 and was further reduced to 8.2% by 1979. Since then, Taiwan has implemented various economic incentives to encourage them to return. The Taiwanese government realizes the importance of RBD. Policymakers have created an attractive environment to encourage these Taiwanese to return home such as a skill- and technical-based infrastructure, a supportive physical environment for entrepreneurs, positive venture capital for industry, and close professional networking with Silicon Valley (Saxenian, 2002).
In 1980, the Taiwan government built Hsinchu Science and Industrial Park (HSIP), which was inspired by Silicon Valley in the United State. The government offered a 5-year tax reduction; a maximum income tax rate of 22%; duty-free imports of machinery, equipment, raw material, and semi-finished products; and know-how as equity shares (www.weforum.org/talentmobility). Report indicates that from 1985 to 1990, around 50,000 Taiwanese returned home under this government development package. Moreover, Taiwanese were pushed to return to their homeland due to limited economic opportunities resulting from the glass ceiling and economic recessions in western countries (Saxenian, 2001). HSIP attracted many engineers to return home due to its strategic location; it is close to public research services, the Industrial Technology & Research Institute (ITRI), and a semiconductor manufacturing technology centre, the Electronics Research and Service Organization (Saxenian, 2002). HSIP offers various incentives to encourage Taiwanese to return, such as a fiscal package for technology investment, a high-quality residential area, a Chinese-American International School, and certain remote work options for some returnees. Furthermore, the strong development of information integration between National Chiao Tung University, National Tsing Hua University, ITRI, and HSIP has created a human resources network that allows the flow and distribution of techniques, information, capital, and creativity.

The returnees who have been allowed to exercise “brain mobility” between Taiwan and United States have given themselves the nickname of “astronauts” as they travel regularly between these two regions (Saxenian, 2007). The majority of the RSETs who returned to Taiwan under this government program were professionals with 10 to 15 years of experience. Their talent and knowledge were directly linked to the science parks to enhance research funding and economics strategies. As a result, the parks have contributed to 70% of global technology industry growth and have developed high-end technology products. This
program has successfully attracted many professionals to return home through a high-quality education platform, quality on-the-job training, and a continuously cultivated research culture (www.weforum.org/talentmobility).

**China**

Chinese citizens began to immigrate to western countries after the Cultural Revolution 1976. They left to further their studies in language, science, engineering, social science, humanities, and business administration at the undergraduate, postgraduate, and postdoctoral levels. Due to the pull factors in western countries, China found itself facing a massive outflow of human talent. China initially started RBD efforts by collecting a database of China diaspora overseas, including students, professors, and professionals (Chen, 2003). From 1990 to 1999, through the Ministry of Personnel, the government funded best scientific research project from overseas through which research centers established in China. A best research paper entitled “Serving for country” (cited in Zweig et al., 2008) had combined knowledge and technology networking from professionals in Silicon Valley, Canada, and China and distributed nation wide. China continued to develop many RBD projects that enhanced human talent inflow to China, such as the Spring Light Project (1996), the Hundred Top Talent Program (1998), the 985 Plan (1998), Serve the Nation (2001), the Incubators Projects (2001), Technology Parks (2002), and Green Channel (2007) (Zweig et al., 2008; Chen, 2003). Throughout the years, China has improved its economic stability, established a solid foundation in research, science, and technology, and instilled a patriotic ideology in the RSETs to serve their nation. These steps have enhanced their human talent development. China blended HRD policy in their 10th Economic Plan (2001–2005) by focusing on education, training, and R&D. Three important agencies have been given the task of attracting, retaining, and developing global talent—the Organization Department of the CPC, the Ministry of Personnel, and the Ministry of Labor and Social Security.
Current trend indicates that China is not worried about the brain drain phenomenon, despite the fact that it is supplying most of the world’s highly skilled migrants, as it also sees a large backflow of overseas talent (Xue, 2012; Zeithammer & Kellogg, 2010). The percentage of the Chinese graduate returnees in 2010 was 32.6%, compared to 28% and 25% in 2008 and 2006, respectively. This shows a positive trend in the new generation to serve and develop their nation (Finn, 2010; Xue, 2012). The highest contributing factors for the return of these RSETs were proximity to parents, social connections with relatives and friends, social status, and the educational opportunities for their children. The pushing factors were highly correlated with the work environments, political systems, and fertility policies in the host countries, such as Japan (Xue, 2012), the United States, and Canada (Zweig et al., 2008).

India

In the 1980s, India approached RBD with an intensive development of science parks that focus on the pharmaceutical industry (Hua, 2011). India developed biotechnology advances by collaborating with western drug companies in performing fairly simple lab work. In order to establish this mission, India attracted Indian-born biologists and scientists to return home with attractive packages and even offered foreign citizens of Indian origin visa-free entry for life and guaranteed work in the country (Hua, 2011). By 2008, more than 280,000 green cards had been issued. A Saxenian (2002) analysis showed that 775 technology companies in Silicon Valley, California, belong to Indian-born engineers, with a gross profit of USD3.6 billion and 16,000 job vacancies.

India continuously plays an important role as a leading country in critical industries, such as R&D in the pharmaceutical industry in Bangalore and telecommunication, technology outsourcing, and advancement in Hyderabad (Wadhwa, 2009). For example, HCL India has attracted many experts from the United States to work in India. In the research lab
category, IBM India has successfully attracted half of all Indian Ph.D. immigrants to return home. A team of Harvard professors conducted an Internet survey in 2008 among Indians and Chinese in the United States, and they found that Indians return to their homeland because of career opportunities, quality of work life, and family considerations. The study also found that the opportunity for professional advancement is 61% among Indians and 70% among Chinese (Wadhwa, 2009). A similar survey reported that most undergraduate and postgraduate students return home within 5 years (55% of Indians and 60% of Chinese). The factors that pushed them back to their home countries were difficulties with getting work visas, citizenship requirements, traffic congestion, pollution, and politics.

Bangalore has been declared as one of top locations for talented professionals who want to settle down. A residential area has been built based on American preferences, such as gated communities, a clean and safe environment, a sports arena, an international school, and an elite community club. The Indian government extends dual citizenship, tax breaks, attractive salary packages with comfortable living standards, and rights to own agricultural land for foreign passport holders. In 2009, there were about 160,000 technology professionals in Bangalore, while there were approximately 175,000 professionals working in Silicon Valley (Raymer, 2008).

India continues to produce a world-class talent due to their excellence in blending HRD into the education system. India established the Academy of HRD in 1990, which offers an HRD master’s and Ph.D. programs. It is a milestone of HRD in the Indian education system and has also impacted the vocational and technical secondary level, such as universities and distance-learning programs. India has 544 university-level institutions, which includes 261 state universities, 73 state private universities, 42 central universities, 130 deemed universities, 33 institutions of national importance, and 5 institutions established under various state legislations (HRD Annual Report 2010-11). India has 79 centrally-funded
institutions, which includes 15 Indian Institutes of Technology, 11 Indian Institutes of Management, and 30 National Institutes of Technology, as per the report. India has shown a serious commitment to HRD—it established its own Ministry of Human Resource Development (MHRD) in 1985 to be responsible for human resource and to develop an educational system on par with international standards. India continuously invests in the education sector; according to HRD Minister, Kapil Sibal, India is prepared to invest USD150 billion to build over 1,000 universities with 45,000 new colleges to support human talent development, which has been estimated to be 40 million by 2020. It is also part of collaboration activity in calling back expertise program and Indian diaspora, the objective of which is to strengthen the workforce sector (MHRD, 2011).

**Malaysia: Beginning Strategies for RBD and HRD Implications**

Malaysia is the third largest economy in Southeast Asia and is hopeful of quickly becoming a developed country; for this process, talent is a crucial factor, and it is directly connected with the percentage of Malaysians who are leaving the country. In 2010, 1.5 million Malaysian nationals were living in other countries. This is equivalent to approximately 5% of the entire Malaysian population. The best beginner strategy is “calling back Malaysian expertise to return to its homeland” to be an anchor for economic development. Analyzing the success of South Korea, China, Taiwan, and India can provide a roadmap that will help Malaysia develop an RBD strategy to attract talent. The aim of developing “the right tools for the right job” will place Malaysia at the right junction with other countries, such as Korea, which has shown achievement in educational development, industry attractiveness, and continual development in science and technology. Skills and talent are of utmost importance in developing a successful economy, yet the best talent is still leaving Malaysia. Malaysia falls below the average in talent bases across the world,
achieving only 23.4% in the “labor force with tertiary education” (the OECD average is 27.4%), 28% in the “skilled labor force” (the OECD average is 37.6%), and 36.6% in “labor productivity” (the OECD average is 64.8%). Knowledgeable employees or k-employees are an important weapon for determining a country’s productivity level, as 80% of new jobs are based on “intellectual expertise”. However, only a few Asian countries are able to see and adapt the need to have k-employees as their primary strategy, which directly contributes to their socioeconomic development. Creating the right environment for the emergence of such workers will be an important consideration in Asia throughout this next century (Silva, 1997).

In 2010, there were about 1 million Malaysians working abroad, with one-third of them holding at least one tertiary education qualification, which is useful training for developing a nation. The biggest challenge is to attract the Malaysian diaspora from Singapore, where more than 50% of total Malaysians living abroad reside.

Additionally, in 2012, the Australian government introduced a new immigrant policy encouraging talented professionals to move to Australia by offering graduates the chance to study and then stay and work in the country for up to 4 years after graduation. A ‘borderless workforce’ (Immigration Department of Australia and Citizenship, 2011) is a new concept that has been introduced to encourage talented professionals to work easily without visa restrictions (Immigration Department of Australia and Citizenship, 2011). These two tactics are a pull factor that encourages Malaysians to stay in Australia. Analysis has shown that 1 out of every 10 Malaysian graduates is leaving the country to work in other more developed countries. It was reported that 10% of Malaysian talented professionals end up in other countries because of social injustice, lack of career prospects, and compensation differences (The Star, 2011). In 2011, statistical data from the National Economic Advisory Council (NEAC) indicated that 385,000 Malaysians left Malaysia for further study and better career development. It is crucial for the Malaysian government to slow down this brain drain and to
focus on human capital development to fulfill their Vision 2020. Malaysia needs a new strategy to attract talent or to reverse the brain drain.

One of the Malaysian government’s strategies has been to use HRD as a backbone for developing a knowledgeable nation by 2020 through the 9th and 10th Malaysian Plans. The 9th Malaysian Plan focused on HRD by increasing the nation’s capacity for knowledge and innovation and by nurturing a “first class mentality” workforce (Zabeda, 2009). Meanwhile, the 10th Malaysian Plan put more emphasis on overall growth, development through partnership, and talent development (Malaysia, Economic Planning Unit, 2010). A few agencies play important roles in nurturing, developing, and establishing HRD as a part of country development including the Human Resources Development Fund (HRDF), Academy Science Malaysia, the National Science and Technology Policy Plan, research institutes, science and technology parks, and business incubators. HRDF was established in 1993 with objective of providing a payroll levy scheme for the industrial sector.

The sequence of agenda under the National Science and Technology policy plan is as follows: First, the National Science and Technology was established through the 5th Malaysian Plan in 1986. Its main objectives were to enhance human capital through the improvement of skills and knowledge and to support the process of technology transfer by providing a conductive infrastructure for foreign investment. Second, the National Science and Technology Policy Plan was established in 2003 with the objectives of strengthening R&D capacity, promoting a scientific and technology culture, and the commercializing the research output. Third, the National Scientific Council was established in 2010 to focus on promoting the commercialization of technology. It has been considered under National Science and Technology II (2001–2010). Fourth, National Council of Science, Research, and Development was established in 2010 to ensure that the country’s investments in science and
technology were able to contributed greater value to increase productivity, environmental quality, stimulation for R&D, and to enhance Malaysian workforce skills (Vilasini, 2011).

The National Innovation Council was established in 2011 to strengthen and to support the innovation-led growth programmed under the 10th Malaysia Plan. The long term program has been implemented right in primary school to tertiary level in terms of emphasis on science, mathematics, and English language as tools for innovation and a talent development (MOSTI, 2011; Mani, 2002). Numerous institutions directly contribute toward human capital development in Malaysia, such as the Malaysian Science and Technology Centre, the Malaysian Institute of Microelectronic, the Malaysian Institute of Government Group for High Technology (MIGHT), and the Malaysian Technology Development Corporation (MTDC). Moreover, to increase the participation of industries in R&D, the Malaysian government plays an important role by promoting incentives and research grants, such as the Research and Grants Scheme, the Multimedia Grant Scheme, the Demonstrator Application Grant Scheme, the Technical Acquisition Fund, the Intensification of Research in Priority Areas, the Program and Commercialization of Research and Development Fund, and a tax incentive for R&D activity (Mani, 2002). However, Malaysia does not have concerted policy for the development of the venture capital industry (Mani, 2002).

Talent Corporation (TC) was established by the Prime Minister’s Office to create various solutions to overcome talent issues and brain drain directly; hence, programs such as ‘The Returning Expert Program, Scholarship Talent, and Retention (STAR); Talent Acceleration in Public Service (TAPS); and the Career Fair Incentive were introduced. Eventually, through the Human Resource Ministry, the government launched a program to encourage RSETs to return home via the “Returning Malaysians Experts Program” in 2001; however, the program was not that successful.
In 2006, the government approached the first groups of brain drain professionals, but their offer was not attractive enough. In 2012, the Malaysian government added more incentives to target Malaysian students and professionals abroad in critical fields, especially in STEM. TC recorded 680 highly skilled returnees in 2011 and has shown positive results for 2012. By June 2012, TC approved 500 applications and 1,192 Return Expert Program (REP) applications were on progress. A recent figure shows TC recorded 1,300 new returnees through REP (The Star, 2012).

TC serves Malaysian brain drain by offering three package programs: REP, STARS, and TAPS. These three niche groups have significantly contributed to an increase of talented professionals in Malaysia. REP offers a flat tax reduction of 15% income for 5 years, a tax exemption for personal items brought back from abroad into Malaysia, no tax for two locally assembled automobiles, permanent residency for foreign spouses and children, and all foreign-born children are able to attend international school under the expatriate quota. However, many diaspora communities were not only expecting tax reduction and free tax for local cars, but also opportunities for career and industry development (Talent Corporation, 2012). In addition to calling back Malaysian expertise, the Public Service Department (PSD) sponsored scholarship holders under a STAR package. STAR enables PSD scholars to serve their scholarship bond in the private sector. Most STAR holders are given priority at key Malaysian companies to support the Economic Transformation Program. Another substitute program is TAPS, which is an on-the-job-training program for high-performing and high-achieving PSD scholars who recently graduated from top universities worldwide. This program is a joint venture program between TC, the Razak School of Government, and PSD. The main purpose is to identify and nurture talents for the Malaysian public sector.

A concurrent survey, which was conducted by student communities abroad to help TC redefine its strategy, revealed that many Malaysian left the country due to social injustice
(80%), career prospects (70%), and compensation packages (73%). The same survey indicated that Malaysians living abroad would return if a new paradigm shift from a race-based evaluation to a needs-based affirmative action changes (76%). Others also demand positive changes in the public sectors (74%) and positive changes in the business environment (54%) (www.wakecallupmalaysia.com). A few pessimistic professionals felt that the TC return packages are not attractive enough or add no value to their career prospects.

**Conclusion and Recommendations**

Malaysia has been ranked as 61 out of 193 countries on the Human Development Index (HDI) and was labeled as a high human development country in 2011 (UNDP, 2010). However, Malaysia needs many HRD booster activities to transform itself into a developed country by 2020. Malaysia should be able to establish strong packages to attract Malaysian professionals and to solve the brain drain problem. Even though statistics indicate that the outflow of Malaysians to developed countries is still high, especially to Singapore and Australia, TC and the Malaysian government believe that right strategies should be able to draw skilled professionals back to their homeland. Based on the above discussions, Malaysia should come up with more bold actions and strategies to complement the existing facilities in the country, based on the experience of the selected Asian countries. Recommendations for future action are as follows:

- There must have comprehensive databases about Malaysian diaspora abroad that comprises professionals according to fields of expertise, job positions, institutions to which they are affiliated, age, work experience and other demographic characteristics such as gender and family status. These databases should be updated periodically.
- It is possible for Malaysian government through the Ministry of Human Resource and Development and Ministry of Science Technology and Innovation (MOSTI) to fund
best scientific research project from overseas for a specified duration. Through this collaboration research centres can be established in Malaysia in which RSETs from abroad may be deployed together with foreign professionals. Not only does the country receive returnees, it also gains in terms of transfer of technology from the foreign researchers.

• Malaysia should continuously develop many RBD projects that enhance human talent inflows to the country. The various programs that are already in place such as The Returning Expert Program, Scholarship Talent and Retention (STAR), Talent Acceleration in Public Service (TAPS) and Career Fair Incentive (CFI), should be further nurtured and injected with innovations to make them attractive and sustainable.

• Malaysia should blend HRD policy in their 10th Development Plan (2010-2015) by concurrently emphasizing education, training, and R&D as have been the emphases in India and China right from the primary school up to tertiary level. More agencies in Malaysia should be given the tasks to attract, retain and develop global talent other than TC. HRD should be treated as key strategy for regional development. This should be understood by all policy makers including economists, educationists, politicians as well as public administrators. Emphasis must be made clearly toward producing diverse talent qualities.

• Malaysia should nurture talent in young generation by developing Science, Technology, Engineering and Mathematics (STEM) education that encourage creative thinking and problem solving skills. This is to prepare the population with wide science based knowledge for them to have three competitive values, namely industry supporting spirit, quality education, and advance R&D.
• There is a need to set up biotechnology advancement centres by collaborating with western drug companies in performing fairly simple lab work in Malaysia. In order to establish this mission, Malaysia should be able to attract biologists and scientists to return home with attractive packages. Biotechnology is an area where many locally available flora and fauna can be used as the industrial raw materials of which it can generate outputs in numerous forms for the benefit of mankind.

• Other than preparing economic incentives to encourage returnees, Malaysian government also needs to create attractive environment for them such as skill and technical based infrastructure, physical environment for entrepreneurs, positive venture capital for industry and close professional network with their former industrial ground such as Silicon Valley in the United States. In line with this, the government should offer a reasonable tax reduction based on year, maximum percentage of income tax, duty free imports of machinery, equipment, raw materials and semi-finished products and know-how as equity shares.

• The returnees should also be allowed to exercise brain mobility between Malaysia and the former country of their employment. The professionals should be allowed to travel regularly while doing business between the two regions.

The fruits of HRD are evident in the much publicized rapid development achieved over a short period of time by Korea, Taiwan, China and India. This has been equally supported by World Bank studies of East Asian development, which have identified that investment in human capital is very important for a country as it has a strong link to labor skills and the economy. HRD has been classified as an aspect of human capital accumulation and the effectiveness of investment in the HRD will also felt in RBD. With the above suggestions, Malaysia should be able to establish strong packages and strategies to attract Malaysian expertise so as not to perpetually let the brain drain goes unresolved. Even though statistics
indicate the outflow of Malaysian is still high to developed countries especially to Singapore and Australia, however TC and Malaysian government believe that the right attraction strategies should be able to direct expertise to homeland.

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