Education and human capital management in a world city: the case of Singapore

K. C. Ho & Yun Ge

Department of Sociology, National University of Singapore, Singapore

Published online: 21 Sep 2011.


To link to this article: http://dx.doi.org/10.1080/02188791.2011.595058

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the “Content”) contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at http://www.tandfonline.com/page/terms-and-conditions
Education and human capital management in a world city: the case of Singapore

K.C. Ho* and Yun Ge

Department of Sociology, National University of Singapore, Singapore

(Received 8 April 2010; final version received 14 April 2011)

There is considerable evidence to suggest that the human capital needs of the world city differ from what Robinson calls “ordinary cities” or what Markusen and associates term as “second tier cities”. This path is blazed most notably in the field of world cities and the flow of skilled labour, in the work by Sassen and with case examples (finance, law, accountancy) provided in the work by Beaverstock and his associates. This focuses on producer services and migration flows needs to be matched by an accompanying look at city-based strategies. This paper represents an attempt to provide this by providing a case history analysis of Singapore in three stages of growth – as port city, industrial city and as world city – in order to show how the evolving infrastructure associated with human capital (education, immigration and labour policies) allows human capital to be developed, attracted, harnessed, deployed, released and retained.

Keywords: human capital; migration; Singapore

Introduction

A world city is termed as such for its particular economic role. According to Friedmann (1986), world cities represent key nodes in articulating the global economy. This articulation function has been elaborated by Sassen (2001) who argued that it is producer and financial services which define the economies of these cities. Along with Sassen, Beaverstock and his associates have provided a number of case examples drawing from finance, law, and accountancy (Beaverstock, 1996; Beaverstock & Smith, 1996; Beaverstock, Taylor, & Smith, 1999). Another line of research was started by Castells and Hall (1994) when they argued that the world economy also produced “technopoles” – major industrial complexes tasked with producing the innovations which are the technological foundations of manufacturing. While these centres of innovation need not be based in cities, Castells and Hall (1994) include in their typology metropolises which have kept their technological role (Tokyo, Paris, London) as well as newer industrial-urban centres. The economic geography and urban studies literature on world cities has largely focused attention on the activities which make such cities distinctive, the types of policies which go into the making of these cities, as well as some of the consequences of world cities.

Our contribution to this literature in general and to the education literature especially is to raise the question of the education and human capital foundations of such world cities. How do the human capital requirements of world cities differ from other types of cities?

*Corresponding author. Email: sochokc@nus.edu.sg

ISSN 0218-8791 print/ISSN 1742-6855 online
© 2011 National Institute of Education, Singapore
http://dx.doi.org/10.1080/02188791.2011.595058
http://www.tandfonline.com
What changes to the education system must be effected to create such human capital? In order to answer the first two questions, we take a historical perspective and examine the city-state of Singapore in its previous incarnations as a port city and an industrial city and see what type of education system supports such an economy and how it is different from that of a world city.

Sassen (2001) argues that world cities are likely to have increased income inequality firstly because a significant share of the manufacturing base which has better paying jobs have migrated to other countries, and secondly because the remaining management layer in producer service is likely to command very high salaries because they have to oversee important regional and global operations. This latter point has important implications for migration and education. Holsten and Appadurai (1999, p. 13) argue that because:

transnationalization generates a new global network of cities through which capital and labour pass…nation states modify their organizational and especially legal, structure to attract global resources…to give special privileges to the managers of global capital, in the sense that it absolves them from local duties and makes them immune to local legal powers.

Isin (1999, pp. 278–279) also observes that within the network of flows, the city “emerge[s] not as a place of loyalty but as a space where the new professions are organized”. These professionals display an occupational solidarity (Isin, 1999) and a diasporic identity (Holsten & Appadurai, 1999).

And so, the question we want to raise is if world cities host important management activities as well as science and technology functions which require talented individuals to staff such positions, and if talented individuals form the human capital foundation of world cities and are therefore in demand from other world centres, do they stay or are they more likely to move to other competing cities? This is a difficult question to find answers to, and our sense is that in world cities, the companies which host these functions develop ways of attracting and circulating these individuals around in different centres (see Ito & Iguchi, 1994, for the case of Japanese skilled workers following the expansion of Japanese direct investments into Southeast Asian countries). One way of understanding the flow of talent is to focus the analysis at the source, which is the education system and how the production of graduates is tied to the demands of the labour market.

Human capital management in three phases

Singapore as a port city

After over 100 years of development as a port city under the British, the colonial government had in 1933 contemplated the idea of encouraging the development of manufacturing through the provision of tariff protection for infant or growing manufacturing activities. In the end, they took the following decision:

Though the interests of the local manufacturer would be best served by protection, the interference with the freedom of the port which would be involved might be disastrous to the entrepot trade… The prosperity of Singapore has been built on its entrepot trade. Industrial development is a later growth and has not begun to approach the entrepot trade in importance. To disturb this merely for the sake of protecting still problematic industries would be to throw away the substance and grasp the shadow. (Straits Settlements, Report of Commission, 1933–34, p. 152, as cited in Pang & Tan, 1981, p. 141)

This particular position illustrates a number of characteristics about the colonial government’s position regarding economic development in Singapore. Most obvious is the clear preference for focusing on trade as the dominant sector as the government’s approach was to concentrate on its strength rather than worrying about developing new types of
activities. The related point is perhaps more damming, and this is that the reluctance to consider alternative forms of development reflected a more laissez faire state policy. The development of the economy was left in the hands of merchants and local enterprises.

Local manufacturing that developed under the shadows of such a state policy was significant (Table 1 indicates that the employment share for manufacturing was 14.2% in 1957) but was of a secondary, supportive character, an outgrowth of the entrepot economy. These activities were either confined to production for the domestic market (e.g., foodstuff), the processing of primary commodities produced in the region (e.g., wood products), or grew out of servicing the transportation network and the British military base, such as engineering services (Chia, 1989; Lee, 1973; McGee, 1967).

Under the laissez faire colonial policy, the education system was developed under a migrant plural society where each community took care of its own. The key component in such a diversified system was the learning of ethnic culture and traditions and less to do with human capital development. Given the small family enterprise nature of the economy, a system of apprenticeship was more important, supported by basic literacy and numeracy skills provided by different community schools. The funding for such schools came from rich merchants (Ho, 2006) and the curriculum followed those of the home country (Wong & Apple, 2002). The attempt to manage human capital at the national level through interventions in the education system was practically non-existent.

After the Second World War, attempts were initiated to try to unify this diverse system (Tan, 1997). But as Wong and Apple (2002) argued regarding the case of Chinese schools, these efforts encountered systematic resistance from the Chinese community because each system of schools had their own rules, practices, social relations and curriculum. As Gopinathan (1999, p. 296) pointed out, “Singapore inherited from the British, a divided, under-resourced [education] system incapable of meeting either the citizenship or the economic challenge”.

The decline of the entrepot economy as a result of newly independent nations in Southeast Asia exerting control over markets and resource hinterlands resulted in diminishing contributions of the commerce sector to GDP. However, this decline was gradual and it was not until after the mid-1970s that the manufacturing sector overtook commerce (retail and wholesale trade) as the leading employment sector (see Table 1).

Aggravating the slow decline of the entrepot economy was the labour situation. Adding to the surplus labour from the declining entrepot sector was the post-war natural population increase, which jumped from 4% in 1950 to 5.5% in 1959 (Department of Statistics, 1983,

Table 1. Employment share for major sectors in the Singapore economy.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>14.2</td>
<td>21.9</td>
<td>30.1</td>
<td>28.9</td>
<td>20.8</td>
<td>21.4</td>
<td>15.7</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>24.2</td>
<td>23.4</td>
<td>21.3</td>
<td>15.6</td>
<td>15.5</td>
<td>14.6</td>
<td></td>
</tr>
<tr>
<td>Finance and business services</td>
<td>4.6</td>
<td>3.9</td>
<td>7.4</td>
<td>15.2</td>
<td>15.4</td>
<td>15.8</td>
<td>19.5</td>
</tr>
<tr>
<td>Total</td>
<td>471.1</td>
<td>650.9</td>
<td>1,077.1</td>
<td>1,537</td>
<td>2,094.8</td>
<td>2,266.7</td>
<td>2,905.9</td>
</tr>
<tr>
<td>Non-resident workforce*</td>
<td>20.7</td>
<td>80.3</td>
<td>248.2</td>
<td>622.5</td>
<td>2,608.5</td>
<td>1,044.3</td>
<td></td>
</tr>
</tbody>
</table>

+ after 2006, the employment figures were provided only for residents (citizens and permanent residents). The non-resident workforce was excluded from the employment share figures.
Particularly worrying was the immigration problem. Prior to 1965, Singapore was part of the Federation of Malaya and the two countries shared an unrestricted mobility immigration policy. As the biggest city in the Federation, Singapore experienced a net migratory surplus from the Malayan peninsular, resulting in an annual net increase from 3,442 persons in 1950 to 11,243 persons in 1959 (State of Singapore, 1961, p. 9). In 1958 and 1959, more than two-thirds of the migratory surplus were young people aged 15–29 who were actively in search of work. These forces, along with self-government in 1959, pushed the government to consider industrialization as an alternative economic strategy with the view that Singapore must “jealously guard its position as an entrepot” (The Malaya Tribune, March 13, 1953, as cited in Goh & Gopinathan, 2006, p. 6).

**Singapore as an industrial city**

The initial period of the industrialization programme saw the creation of a set of institutions (e.g., economic development, monetary, housing authority) as well as a set of pioneer industry incentives. But the unstable regional political climate and local political uncertainties in the 1950s and early 1960s hindered the infrastructural developments. However, from the mid-1960s onwards, two industries – textiles and petroleum – started to show dramatic advancements, which continued all the way to the 1970s.

The period from the 1970s to 1990s were the golden years of Singapore’s industrialization. The industry with the longest sustained period of increases in contribution to manufacturing output has been the electronic components industry. With a small base of manufacturing and repair of electrical appliances, this industry has gone through a series of transformations with the entry of multinational corporations since the late 1960s. The increasing share of manufacturing output by the chemicals and pharmaceutical industry was largely due to the entry of multinational pharmaceutical companies producing medicinal drugs such as antibiotics to meet overseas demand. As early as in 1978, the export-oriented nature of the pharmaceutical industry in Singapore became apparent when Singapore was one of the only 10 countries in the world that exported more pharmaceutical products by value than they imported (Gereffi, 1987, p. 188). From 1985 to 1988, the contribution of medical and pharmaceutical products to the output value of the industry group increased from about 50% to 61% (Department of Statistics, 1987, p. x; 1988, p. viii).

In response to the concerted push towards industrialization that increasingly required skilled labour, the education system underwent two phases of transformation. Since the nationalization of schools following Singapore’s independence in 1965, aside from the paramount goal of creating a national system through the standardization of the curriculum, the economic focus of the education system in the first phase of the industrial period (1960s to mid-1970s) had been to expand educational opportunities to the population at large and to initiate technical education. Vocational schools were started in 1964 with an enrolment of 4,910 students (Goh & Gopinathan, 2006, p. 15). The Technical Education Department was set up within the Ministry of Education in 1968, which later became the Industrial Training Board in 1973. Technical education was expanded in secondary schools with the introduction of a technical stream in the curriculum. The number of students in this stream expanded from 12,000 in 1971 to 18,000 by the end of the 1970s (Cheung, 1994).

In this early phase of industrialization, Pang and Low (1994) pointed out that the generally low education levels of the workforce did not slow down Singapore’s economic development because the labour-intensive industrial activities during this period generally required low skills. It was after Singapore had achieved full employment in the mid-1970s that a higher skilled labour force was needed to sustain the manufacturing sector.
Under such a context, existing workers had to receive further training in order to maintain their jobs and new labour were required to possess more sophisticated working skills than the previous generation in order to enter the employment market. In 1979, the Vocational and Industrial Training Board was thus created and the Continuing Education and Training scheme it launched helped retrain 60,000 workers per year (Law, 1996, p. 11). Significantly, the Institute of Technical Education (ITE) was created in 1992 to provide an integrated platform of industrial training for post-secondary education, part-time continuing education for workers as well as more specific industrial training offered by employers (through apprenticeship schemes and on-the-job training schemes) and skills certification programmes. In 1996, Law Song Seng, CEO of the ITE, wrote that “the most important challenge is to ensure that the training system remains relevant and responsive to the nation’s changing skilled manpower needs” (Law, 1996, p. 20).

This point assumes greater relevance in an urban economy, where flows of economic activities in and out of the city occur at an accelerated pace. In a global economy, companies often move manufacturing and services activities to new and emerging markets with lower production cost and a large and cheaper labour pool. And as dominant industries fade out and new industries are attracted to the city as replacements, the task of human capital management is the anticipation of changing skill sets in the wake of a dynamic economy, and the timely response which is needed from the education system to help the city cope with such rapid restructuring to its urban economy.

**Singapore as world city**

The world economy depends on a dense communication and transportation network to co-ordinate and move goods, people and services, and cities have been at the centre as hosts or nodes for such networks. According to Friedmann (1986), cities which have an expanded role in co-ordination and movement of these types of economic flows thereby connecting their immediate region to the rest of the world are termed “world cities”. The works of Scott (1987) and Henderson (1989) demonstrate how Hong Kong and Singapore have increased their prominence as regional centres with strategic links to the West and Japan, with the development of electronics production in Southeast and East Asia. Rimmer’s (1996) detailed analysis of various types of transport and communication linkages has also indicated the increased interactions between key cities (including Singapore) in the Asia-Pacific region when this region was increasing in economic importance. An expanded role as a regional node in the global economy should also be reflected in a growing prominence of services, as suggested by Sassen (2001). This can be noted in the increasing employment shares for financial and business services in Table 1.

This shift from manufacturing to services was due in part to the movement of manufacturing activities to Malaysia and also to China. Faced with rising manufacturing costs, since the 1980s, Singapore switched to a service-led strategy of promoting itself as the base for regional headquarters of multinational corporations (Dicken & Kirkpatrick, 1991; Perry, 1992) while at the same time continuing to upgrade its manufacturing base. Perry, Yeung and Poon’s (1998) study of firms with regional headquarters in Singapore found the availability of good quality business services to be a significant factor in the consideration of choice of headquarters location. This close relationship between regional headquarters activity and business services suggests a regional service complex centred in Singapore.

As Singapore has become a world city with an enlarged set of producer and consumer services, the development of human capital has taken several new paths different from that
of its rivals. First, unlike Hong Kong which has gradually abandoned its manufacturing sector, Singapore’s steadfast commitment to manufacturing suggests that it intends to continue to rely upon its technological edge to maintain the competitiveness. Human capital development could no longer be retained at the vocational level, which served the Republic quite well in the 1980s. The new form of human capital development has to depend on a close partnership between universities and industries for research and development, in which engineers and research academics could collaborate on new product design and innovative research. Under such a trend, in the past decade, the National University of Singapore (NUS) and the Nanyang Technological University were transformed into research universities with a cluster of research institutes (Gopinathan, 1999). For the state, it has created the Agency for Science, Technology and Research (A*STAR) to spearhead science and technology research and to develop science parks to attract investment in research by multinational companies.

Second, there has been a significant development of business and management studies in Singapore. This included the development of a third smaller specialized management university (the Singapore Management University), as well as the attraction of well-known business schools such as INSEAD (Institut Européen d’Administration des Affaires) and the University of Chicago Business School to host their programmes in Singapore (Olds & Thrift, 2005). As Olds and Thrift (2005, p. 207) point out, the development of this institutional system will expose Singaporean educational institutions to competition (thereby forcing them to upgrade), and to produce (in discursive and institutional senses) a “global education hub” that would be attractive to students from around the Asia-Pacific region. In theory this cluster of educational institutions would produce and disseminate knowledge at a range of scales, supporting local and foreign firms in Singapore, state institutions in Singapore, and firms and states in the Southeast, East and South Asian regions.

The third development is perhaps the most controversial one – the relaxation of immigration for attracting foreign talent. After suffering the limits of a small workforce (full employment was reached by the mid-1970s) for over a decade, government planners announced in 1989 a relaxation of immigration control for attracting foreign talent (“S’pore widens door”, 1989). In 1991, the Economic Development Board set up an International Manpower Division which effectively meant that the Board’s role of attracting overseas investment to Singapore had been supplemented with the added function of attracting skilled manpower. This initial specific focus has since been expanded to attract a wider range of professionals as well as foreign students (Nathan, 1997). At the same time, another group of foreign workers, who have lower education levels, have taken up the menial work. The workforce in Singapore is categorized into four types: (1) Citizens; (2) Permanent Residents; (3) Non-residents who are on professional employment passes; and (4) Non-resident semi- and unskilled workers who are on work permits. Table 1 presented earlier shows the impact of the liberalizing immigration policy since the 1990s. The 1970 Census documented only slightly more than 20,000 non-resident workers who were mainly Malaysians. The work permit system was originally started in 1965 and was targeted mainly at Malaysians who found employment in Singapore’s growing industrial sector (Yap, 1999). By the 1980, the figure had risen to about 80,000 non-resident workers, still mainly Malaysian (Stahl, 1984), and constituting less than 10% of the Singaporean workforce. The non-resident workforce comprised 16.1% of the Singapore labour force in 1990, and jumped to 29.2% in 2000. In 2008, it climbed to 34.4% of the workforce. Thus, the development of Singapore as a global city has meant openness with regard to the entry of foreign labour to augment the domestic labour force.
Bringing in foreign talent to the world city: Singapore’s experience

Singapore’s shift to world city status has been closely associated with its openness to foreign workers. From the Singapore government’s planning viewpoint, the different types of foreign workers allow different labour market objectives to be met. Those who are unskilled or semi-skilled with work permits are seen by government planners as a dispensable pool which can be expanded or contracted according to the demands of the economy. And those holding employment passes are deemed “foreign talent” whose skills are in demand in world cities (Holston & Appadurai, 1999; Ong, 2007). This latter group are in short supply worldwide and are seen to play a significant role in contributing to economic growth and development. This developmental role was seen as so important that at the height of the Asian financial crisis in 1997/98 when job opportunities were scarce, the government launched a drive to attract foreign skilled professionals, managers and entrepreneurs (Ho, 2003). The justification of this initiative was explained by a national trade union official:

We do not favour job protectionism. We have been explaining to workers that such a policy is detrimental to their own interests... In good times or bad, we need foreign talent to add value to our economy. This, in turn, will lead to the creation of more jobs for our own people. ("Unions", 1998)

International students, who are identified as potential high skilled foreign talents, are one of the important groups that a world city tries to attract and hold on to. There are several advantages of seeing international students as potential skilled labour for the national economy. As students who have studied in local schools and universities, they are likely to be better integrated, have developed friendships, and understand the local customs and language. Thus, their entry into the local labour markets will be much smoother compared to workers coming from abroad. At the university level, the contribution of graduate students to research and development is also significant. Cellaraj, Maskus and Mattoo (2004) found that international graduate students contributed significantly to innovation capacity in the United States. Their analysis concluded that a 10% increase in the number of foreign graduate students would raise patent applications by 3.3%, university patent grants by 6.0% and non-university patent grants by 4.0%. Singapore recognized this group as foreign talents in the mid-1990s when it developed policies to attract foreign students to its schools ("Top schools", 1996). Soon after, Singapore universities made their fees more attractive in the hopes of attracting more foreign students ("Drawing talent", 1997).

If international students, particularly those in higher education, represent a highly desired group perceived to contribute significantly to the host economy, it is imperative that they stay on after graduation. Some evidence of the intentions of foreign university students in Singapore after graduation is drawn from a survey of 500 international students studying at NUS. The analysis will profile the group of students who indicated in the survey that they plan to stay in Singapore after graduation. The profile is intended to show their abilities and where these abilities are deployed within the university. The analysis will also compare this group (termed as “stayers”) with the leavers. Using the t-test for difference between group means, the analysis will show critical differences and will allow us to make further inferences about the stayers versus the leavers.

Profile of the staying group

Are those who have indicated the intention to stay “talented”? Table 2 provides data on the self-reported ranking of these students within their own schools prior to gaining entry to
NUS. About 63% of those who intend to stay indicated that their final-year academic results were within the top 10% of their school cohort. Graduating at the top of their respective institutions in their home country, this group is clearly academically talented. They are likely to benefit from their tertiary studies in Singapore and are poised to be in great demand upon graduation.

Engineering (45.0%) and Science (28.0%) combined account for 73% of international students who want to stay in Singapore (see Table 3). This is significant because it represents a match between policies to attract and develop human capital in the education system and their incorporation into the labour market. As a city-state, Singapore acknowledges that a world city is advanced in Science and Technology. In order to keep its competitiveness, a great emphasis on research and technology has been made in the education system. The data from the Office of Deputy President in NUS shows, in aiming to establish world-leading research programmes, nearly 40 research centres and institutions were set up in or affiliated with NUS. As a result, the students’ enrolment in Engineering and Science at NUS also takes the top two positions (63.8%), which reflects that Singapore has strong Science and Technology programmes which are attractive to international students. The data from Table 3 also points to the recognition that the employment opportunities for Engineering and Science graduates are better in Singapore than the neighbouring countries.

Research and technology hubs like Singapore Science Park agencies, A*STAR, which is a government-led agency dedicated to attract world-class scientific research and talents, and multinational companies which account for more than two-thirds of manufacturing output in Singapore, require better educated and skilled labour and offer plenty of job opportunities.

Table 2. Final academic results prior to NUS entry.

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 5%</td>
<td>91</td>
<td>44.17</td>
<td>44.17</td>
</tr>
<tr>
<td>Within 5 to 10%</td>
<td>39</td>
<td>18.93</td>
<td>63.11</td>
</tr>
<tr>
<td>Within 10 to 25%</td>
<td>29</td>
<td>14.08</td>
<td>77.18</td>
</tr>
<tr>
<td>Within 25 to 50%</td>
<td>16</td>
<td>7.77</td>
<td>84.95</td>
</tr>
<tr>
<td>Within bottom 50%</td>
<td>4</td>
<td>1.94</td>
<td>86.89</td>
</tr>
<tr>
<td>Unable to determine</td>
<td>27</td>
<td>13.11</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Faculty of enrolment.

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>90</td>
<td>45.00</td>
<td>45.00</td>
</tr>
<tr>
<td>Science</td>
<td>56</td>
<td>28.00</td>
<td>73.00</td>
</tr>
<tr>
<td>Arts</td>
<td>21</td>
<td>10.50</td>
<td>83.50</td>
</tr>
<tr>
<td>Computing</td>
<td>19</td>
<td>9.50</td>
<td>93.00</td>
</tr>
<tr>
<td>Business</td>
<td>9</td>
<td>4.50</td>
<td>97.50</td>
</tr>
<tr>
<td>Public Policy</td>
<td>3</td>
<td>1.50</td>
<td>99.00</td>
</tr>
<tr>
<td>Medicine</td>
<td>1</td>
<td>0.50</td>
<td>99.50</td>
</tr>
<tr>
<td>Architecture</td>
<td>1</td>
<td>0.50</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>
**Comparison between the stayers and the leavers**

What characteristics distinguish between the stayers and the leavers? Table 4 indicates the three variables that differentiate the two groups. There are more single international students who intend to stay in Singapore than those who intend to leave ($p < .001$). This creates the opportunity that they may get married (perhaps to local spouses) and settle down in Singapore. More international students in the leaving group are pursuing higher degrees in this university than those in the staying group ($p < .001$). The differentiation is also understandable. In spite of an economy offering jobs at high skill and education levels, the demand of labour market in the city-state of Singapore for graduates with advanced degrees, for instance, PhD, is limited. It is also possible that the international students who are pursuing higher degrees may have their original jobs waiting for them in their home countries, as significant numbers of graduate students come on study leave from their home institutions. More international students who are in the staying group want to get a job after finishing studying in Singapore than those who are in the leaving group ($p < .001$), suggesting that stayers have more confidence in finding a job in Singapore.

Comparing plans between the stayers and the leavers also indicated three significances (see Table 5). First of all, the highest percentage of preference of job in the staying group indicates that over 60% of stayers intend to work in a multinational company. It suggests that Singapore is well known as a city with a fairly large number of multinational companies, which is also an important criterion for a world city. The potential employment capacity of foreign firms in almost all sectors of the economy in Singapore represents a magnet for foreign talents like these international students. Secondly, students who intend to leave recorded a significantly higher percentage for intention to work for their home country government and a significantly lower percentage for intention to work in a multinational company when compared to the staying group. And thirdly, those intending to go for further studies study in Singapore.

### Table 4. Comparison between the stayers and the leavers.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Staying group ($N = 207$)</th>
<th>Leaving group ($N = 258$)</th>
<th>$t$</th>
<th>$df$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>1.06</td>
<td>1.18</td>
<td>−3.92***</td>
<td>439.91</td>
</tr>
<tr>
<td>Degree pursuing</td>
<td>1.53</td>
<td>1.95</td>
<td>−5.58***</td>
<td>461.05</td>
</tr>
<tr>
<td>Plans after study in Singapore</td>
<td>1.15</td>
<td>1.31</td>
<td>−3.54***</td>
<td>437.62</td>
</tr>
</tbody>
</table>

***$p < .001$***

### Table 5. International students’ preference of job after completing studying by decision to stay.

<table>
<thead>
<tr>
<th>Preference of job</th>
<th>Staying group valid percent (%) ($n = 140$)</th>
<th>Leaving group valid percent (%) ($n = 198$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government in home country</td>
<td>2.86</td>
<td>15.66</td>
</tr>
<tr>
<td>My family business</td>
<td>1.43</td>
<td>2.02</td>
</tr>
<tr>
<td>Local or national company</td>
<td>11.43</td>
<td>11.11</td>
</tr>
<tr>
<td>Branch of Singapore company</td>
<td>5.00</td>
<td>5.05</td>
</tr>
<tr>
<td>Branch of home company</td>
<td>2.14</td>
<td>0.51</td>
</tr>
<tr>
<td>Multinational company</td>
<td>60.00</td>
<td>31.31</td>
</tr>
<tr>
<td>University</td>
<td>16.43</td>
<td>32.83</td>
</tr>
<tr>
<td>Start family</td>
<td>0.71</td>
<td>1.52</td>
</tr>
</tbody>
</table>
studies are more likely to leave Singapore for a third country like the United States, which has a more established system of graduate studies.

Estimating the “wastage” of the leavers

In the present study, NUS offered scholarships to 248 (or 49.2%) of the international students and student loans to 122 of them (24.2%). Of the two types of support, study loans are more likely to be of smaller accounts. The scholarship holders receive an amount which is large enough to cover a major portion of their total expenses. Of the scholarship holders in the leaving group 71.9% indicated that their scholarship covered more than 80% of their total expenditures. It is therefore this group of scholarship holders who may represent a “wastage” of resources, because of the amount spent to attract and train them only to have them leave for home or a third country. The evidence in Table 6 shows the international students who intend to leave actually receive significantly more financial support from the university than the ones in the staying group. Table 7 indicates that more graduates are likely to leave compared to undergraduates.

What is the cost (and therefore “wastage”) of educating international students on scholarships? It is difficult to estimate the cost of scholarships because of the varying nature of such financial aid. However, scholars also obtain a second source of financial aid in terms of the tuition fees they are exempted from paying. Taking the example from Engineering and Science which has the largest intake of international students, the tuition fees alone for Academic Year 2010/2011 for undergraduate students are S$37,430. So over a 4-year period, the cost per leaving undergraduate student works out to be S$149,720 for tuition fees alone. The cost for a 4-year period for graduate students from Engineering and Science is S$68,880. University PhD student scholarships can add S$96,000 to $144,000 (or more for the more generous scholarships) to the total cost per person leaving over a 4-year period.

It cannot be simply concluded that Singapore is wasting its resource on international students who leave the country upon completion of their studies. In the case of graduate students, as recipients of university scholarships, they contribute to the teaching and research of the departments they are affiliated to. Increasingly, as the university increases its research capacity, this pool of graduate students will be the critical resource as interns facilitating the research and development work of the university. Using patents and grants as indirect measures of scientific innovations and with data from technical visas granted to

Table 6. Amount of financial aid by decision to stay.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Leaving group (N = 206)</th>
<th>Staying group (N = 148)</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarship + student loan from university</td>
<td>84.37</td>
<td>77.49</td>
<td>-2.73**</td>
<td>352</td>
</tr>
</tbody>
</table>

***p < .01

Table 7. T-test results in leaving group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Undergraduate (N = 47)</th>
<th>Graduate (N = 112)</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarship</td>
<td>4.13</td>
<td>5.42</td>
<td>-4.86****</td>
<td>67.24</td>
</tr>
</tbody>
</table>

****p < .001
foreign students, the econometric analysis done by Chellaraj et al. (2004) led them to conclude that international graduate students make significant contributions to developing new technologies in the American economy. From a longer term perspective, NUS graduate students will continue to facilitate the linkages between Singapore, NUS and the organizations they work for in other countries.

Can a similar argument be made for international undergraduate scholarship students? International undergraduate students who receive scholarships from the university are less likely to contribute to teaching and research while they are in the university the way their graduate counterparts are doing. Longer term contributions of undergraduate students may be similar to graduate students. Gribble (2008) introduces the term “brain circulation” to describe the circular nature of migration and its possible benefits to the sending country even though skilled labour resides in the country of education. Our attempt to analyse the problem of students leaving the country of education is somewhat different from Gribble’s analysis of sender country problems, but the idea of brain circulation works to the advantage of Singapore and other world cities, since graduates will go to where the best economic and quality of life opportunities lay. And so the money spent on international students will benefit the city-state if the idea of circulation holds water and skilled migrants continue to maintain different types of linkages with the city where they spent their formative years building their skill base.

Challenges in managing human capital in world cities

“I keep telling my friends, you go to London and New York, you can be served by a Columbian or a Jamaican or the chef can be from Hong Kong. You get a whole potpourri of culture. That’s a real global city. Here, I don’t know why we have this issue... foreigners are welcomed but not yet that welcomed. That’s something you have to decide,” said Surya Jhunjhuwala, Chairman of the Hind Group. (Tan, 2009)

In the world of global cities, Singapore has been unique as an independent city-state since 1965 for it has full control over its education system and immigration policies. This control has enabled the city-state to engineer its education as well as its immigration policies to fit the demands of its economy, even as the global economy changes the competitive advantages of cities around the world. Such shifts can be seen from port city to industrial city, when the focus of human capital development was on technical education for the industrial workforce and continuing education and re-skilling for upgrading the workforce as new manufacturing activities grow to replace those which have moved to distant shores.

The shift to consumer and producer services represents a more contemporary move as Singapore develops its services in response to a mature manufacturing sector. In this shift, the focus has been on expanding the labour force both in skill levels and in numbers. For a small city-state, such growth has not been without its difficulties. Mr Ngiam, a former high-ranking civil servant, recently expressed a concern about the assimilation problem with such large numbers. He opined,

As we are unable to restore our natural birth rates to replacement levels, we have no choice but to add to our population through immigration. But how do we assimilate the newcomers? With a small population, will we be in a position to assimilate anyone? Or will we instead be absorbed by them as they come from stronger cultures? At what pace should we bring in new immigrants? I do not want to sound alarmist, but a recurrent nightmare of mine is that one day, we will find ourselves strangers in our own land. (Ngiam, 2009)

If Mr Ngiam is right, then Singapore will face a fundamental tension between the economic logic of a world city to expand its population and the accompanying diversity in
the interest of deepening the economy and the socio-political logic of keeping a certain unity within this diversity. Perhaps for the first time since independence, the city-state may have to rethink its unchallenged logic of development as the key goal to consider the socio-political costs that this development brings. It is, as Surya Jhunjhnuwala concludes, something for the society to decide.

The world city, because of its expanded role as a transport, communication and distribution role connecting the immediate region to the world, requires a specific skill set for the effective operation of these roles. Linking skill sets to the needs of the urban economy is the task of human capital management. The case of Singapore has highlighted world city human capital foundations through a contrast with the earlier industrial city phase of Singapore’s development. For Singapore, the human capital management is propped up by two types of policies – the worker policies which discriminate between different types of labour and those which bring in international students with the hope of keeping them after graduation. The analysis of international students at NUS indicates that those who choose to stay are likely to be the top in their high schools, study in science and engineering, and stay on to get jobs in multinational companies. While the policy framework seems to work well, it is the social outcomes which also need to be managed as Singapore adopts a liberal immigration policy.

Note
1. The survey of 500 students was conducted in mid-2008. The non-random quota sample is designed to replicate the international student population in NUS along the following dimensions: gender, science versus non-science enrolment, undergraduate and graduate enrolment. In terms of sending countries, the sample contained 20% from the highest sending country; 20% from 2nd highest sending country; 10% from the 3rd highest sending country; 30% from all other East, South and Southeast Asian countries; and 20% non-Asians. The international student sample was asked to complete a 15-minute questionnaire which collected data on how they selected NUS, their adjustment process and their future plans. The funding for this project comes from the Singapore Ministry of Education AcRF grant R111-000-069-112. The principal researcher (Ho) thanks the Office of Student Affairs for providing the enrolment figures for international students, which allowed for the sampling design to be operationalized.

References


Retrieved from the Factiva database.