

# **Study on the Provision of International School Places in Primary and Secondary Levels in Hong Kong**

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## **Report**

**Policy 21 Limited**

**Commissioned by  
Education Bureau**

**December 2012**

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# Chapter 1 Introduction

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## 1.1 Background

1.1.1 “International schools” is generally defined to embrace schools outside the local education system. For this study, the Education Bureau (EDB) defines international schools as “those schools offering full-time non-local curricula, enrolling students who do not sit for local examinations”. There are 14 schools operated by the English Schools Foundation (ESF), 33 private international schools, and 7 private independent schools (PIS) in the 2011/12 school year (hereafter all references to year refer to “school year” unless otherwise specified). In this study, local students refer to those who are Hong Kong permanent residents (with the right of abode in Hong Kong Special Administrative Region) and do not have any foreign passport (except British National (Overseas) Passport).

1.1.2 There has been a significant increase in the provision of international school places in Hong Kong. Enrolment in international primary schools increased from 14,204 in 2000/01 to 17,399 in 2010/11, while total enrolment in all types of primary schools fell from 493,979 in 2000/01 to 331,112 in 2010/11. As regards international secondary schools, enrolment increased from 11,158 in 2000/01 to 14,461 in 2010/11, while total secondary enrolment decreased from 456,693 in 2000/01 to 449,737 in 2010/11.<sup>1</sup> It may be worth noting the total non-Chinese population (excluding foreign domestic helpers) in Hong Kong increased from 163,892 in 2001 to 197,022 in 2011 (both expressed in calendar year).<sup>2</sup>

1.1.3 Despite the increase in the number of places in international schools over the past years, views expressed by representatives of trade commissions, chambers of commerce and businesses point to the difficulties encountered by some expatriate families residing or planning to reside in Hong Kong to find international school places for their children.

## 1.2 Study objectives

1.2.1 The objectives of the study are as follows:

- a) To stock-take the current provision of international school places at the primary and secondary levels in Hong Kong in 2011/12;
- b) To project the provision of international school places at the primary and secondary levels in Hong Kong and assess its adequacy for the next five school years (2012/13 – 2016/17); and
- c) To facilitate the review of support measures for the international school sector.

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<sup>1</sup> Census & Statistics Department (2011), *Annual Digest of Statistics 2011*, Section 12.

<sup>2</sup> Census & Statistics Department (2012)

## Chapter 2 Study Methodology

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### 2.1 Approach

2.1.1 The current study involves the stocktaking of the current provision of international school places at the primary and secondary levels in Hong Kong in 2011/12 (Chapter 3), and the projection of future demand and assessment of adequacy up to 2016/17 (Chapters 4 to 7). A mixed method approach using both quantitative data and qualitative information is adopted.

2.1.2. The stocktaking is a straight-forward and quantitative data collection exercise, based on the current and planned provision of places in international schools in Hong Kong as well as new schools or extensions in the pipe-line. As regards future supply, it depends on factors including schools' decisions to commit new school building and extension projects, views of schools on the optimum class size and the number of classes, technical feasibility, compliance with administrative and legal requirements and Government's support measures available to them. Relevant qualitative information on schools' decisions to expand capacity and Government support measures is required.

2.1.3 Projecting future demand and assessing adequacy is subject to more uncertain variables and is sometimes supply-driven. In the case of international schools, the demand partly comes from children of expatriate families not yet in Hong Kong and partly from aspiration of local students for education provided in international schools. Indeed, the availability of international school places may instill more expatriate families to come to Hong Kong and more local students to turn to international schools and thus stimulating more demand. Qualitative information on preferences of parents of local students for international schools and recruitment plans of businesses is required.

### 2.2 Methodology

2.2.1 A total of four surveys were conducted in collecting quantitative data and qualitative information from different perspectives, namely the school enrolment surveys, school survey, business survey and thematic household survey.

#### *(1) School enrolment surveys*

2.2.2 The EDB has been conducting annual enrolment surveys to collect enrolment statistics of various school sectors, including international schools, ESF schools and PIS at different education levels in Hong Kong. Information gathered in the enrolment surveys includes the following:

- a) Supply of school places in terms of class structure and provision of places for each stream;
- b) Demonstrated demand in terms of actual enrolment, broken down by grade, gender, age and nationality, for each stream; and
- c) Profile of students in terms of ethnicity, language spoken at home and special educational needs, for each stream.

2.2.3 In the study, time series analysis was conducted on enrolment data. Time series data obtained from successive rounds of the school enrolment surveys covering the period from 2000/01 to 2011/12, provide the necessary information required for projecting the future demand for international school places. The projection is obtained by relating the time series data to say the size of the target population and fitting the relationship derived to mathematical models and extrapolating the models into the future. This is the bivariate time series approach adopted in the study. This will be discussed in greater details in Chapter 6.

## **(2) School survey**

2.2.4 The purpose of the school survey is to collect information on views of international schools on difficulties they have encountered in meeting demand for school places, their plans for expanding current provisions and problems faced. Information collected includes:

- a) Admission mechanism for non-local students, in response to the problems raised during discussions with businesses with employees whose children had to attend international schools in securing places in these schools;
- b) Past and future plans of expansion or reduction of school places for analysis of past enrolment trends and in projecting future provisions of school places;
- c) Problems encountered in increasing the provision of school places; and
- d) Views on government support measures for drawing up recommendations to help international schools meet the anticipated demand for school places.

## **(3) Business survey**

2.2.5 The purpose of business survey was to gather views of businesses with employees whose children had to attend international schools offering non-local curriculum. As no information was available on which business establishments had such employees and given the large number of business establishments in Hong Kong, a disproportionate stratified sampling design was adopted by selecting a higher proportion of business establishments in those sectors which are believed to have a higher number of employees who held or were holding employment (working) visas. The sampling scheme adopted in the survey is given in the table below.

*Table 2.1: The sampling fraction*

<b>Industry group</b>	<b>Employment size group</b>			
	<b>50 or above</b>	<b>10 – 49</b>	<b>Below 10</b>	<b>Total</b>
Electricity, water and gas	31.25%	18.52%	1.83%	4.75%
Manufacturing	58.14%	6.49%	0.05%	2.15%
Import/export, wholesale/retail	25.85%	0.36%	0.01%	0.17%
Transport, storage, courier services, information and communication	52.08%	5.78%	0.30%	2.26%
Financial and insurance services	51.68%	91.03%	0.58%	11.66%
Professional, scientific, technical, administrative services	51.81%	23.98%	0.24%	2.82%
Others	52.03%	3.98%	0.14%	1.87%
<b>Total</b>	<b>46.76%</b>	<b>10.08%</b>	<b>0.12%</b>	<b>1.72%</b>

2.2.6 The business survey covered a random sample of 6,230 business establishments, of which 3,015 establishments were successfully enumerated. After excluding 267 found to have been closed or moved, the response rate was 51%.

***(4) Thematic household survey***

2.2.7 The EDB has commissioned the Census and Statistics Department (C&SD) to conduct a thematic household survey targeting households with school-age children to gauge qualitative and quantitative information on parents' education choice for their children, which allows an assessment of the demonstrated or unmet demand for international school places. The survey, with a sample size of 10,000 households, was conducted during the period from February 2011 to April 2011. Information gathered includes:

- a) Background information on respondents who were studying, including age, nationality and language spoken at home,
- b) Factors affecting the choice of schools;
- c) Types of schools attended by respondents who were studying; and
- d) For households with members studying in international schools, views on competitive edge of international schools, names of schools attended, time taken for admission and plan for study outside Hong Kong.

# Chapter 3 Stocktaking provision of international school places

## 3.1 Overview

3.1.1 In 2011/12, there are 20,063 primary school places provided in schools operated by ESF and non-profit-making private international schools and 6,205 primary school places provided in PIS. The corresponding figures for secondary school places are respectively 16,867 and 6,048. The provision of places between 2000/01 and 2011/12 is set out in Chart 3.1 and Chart 3.2. The overall provision has increased by 58.7% from 30 982 in 2001/02 to 49 183 in 2011/12.

Chart 3.1: Provision of primary school places in ESF schools, private international schools and PIS from 2000/01 to 2011/12

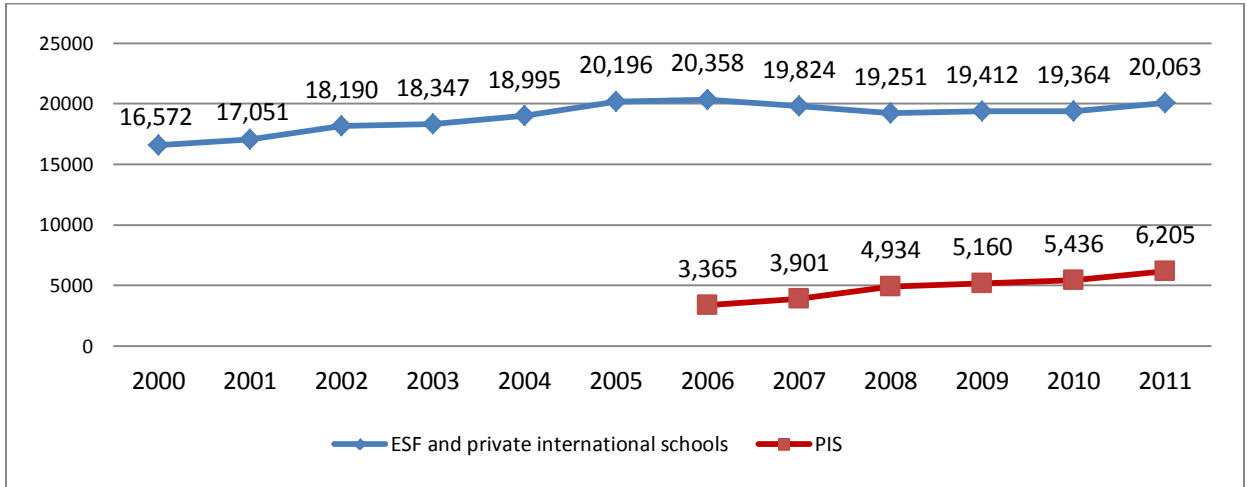
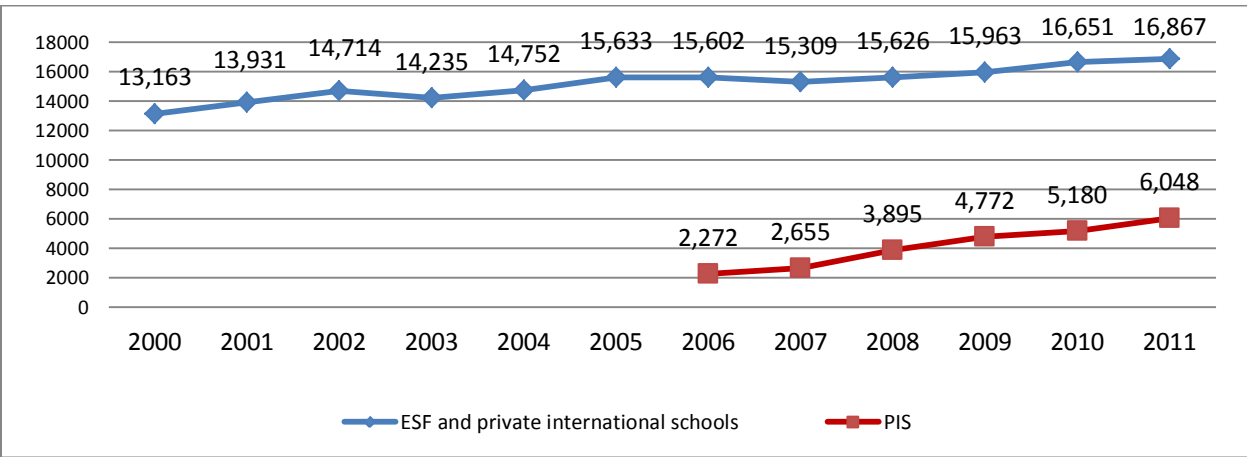


Chart 3.2: Provision of secondary school places in ESF schools, private international schools and PIS from 2000/01 to 2011/12



3.1.2 In the school survey, 61% of international schools reported that they had implemented expansion, redevelopment or relocation projects in the past five years, resulting in an increase in the provision of places. Among these schools, a total of 1,669 places at primary level and 3,817

places at secondary level had been added. This may account for the increase in places over the past five years in ESF schools, private international schools and PIS.

3.1.3 In this Chapter, the provision will be analyzed in terms of fill-up rate, average class size, geographical distribution and planned future provision through data collected in the student enrolment surveys and school survey.

### 3.2 Fill-up rate

3.2.1 Fill-up rate is expressed as a ratio of actual enrolment to the number of places international schools planned to provide. It represents an average of fill-up rate in individual schools. Fill-up rate varies among schools. In 2011/12, the overall fill-up rate of ESF schools, international schools and PIS was 89.8%. As illustrated in Chart 3.3 and Chart 3.4 below, the fill-up rate for ESF schools and international schools are fairly stable over the years. On the other hand, once the PIS sector matures, its places remain highly utilized from 2007/08 especially at primary level. On the other hand, some school places were not utilized. In 2011/12, there were 26% of primary schools and 48% of secondary schools operating below 81% of their provision (Chart 3.5).

*Chart 3.3: Fill-up rate of primary school places in ESF schools, private international schools and PIS from 2000/01 to 2011/12*

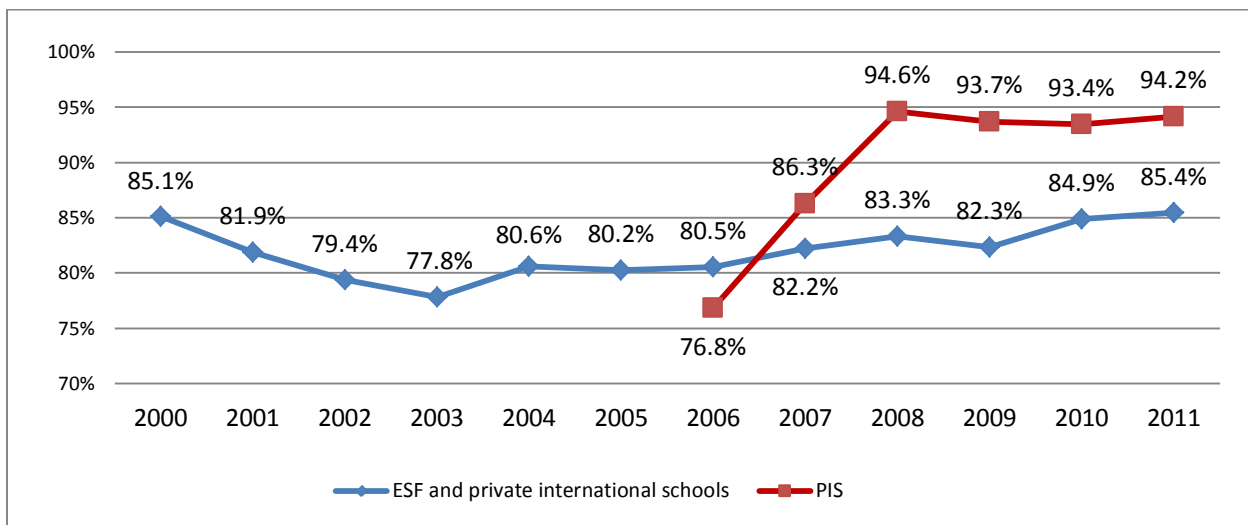




Chart 3.4: Fill-up rate of secondary school places in ESF schools, private international schools and PIS from 2000/01 to 2011/12

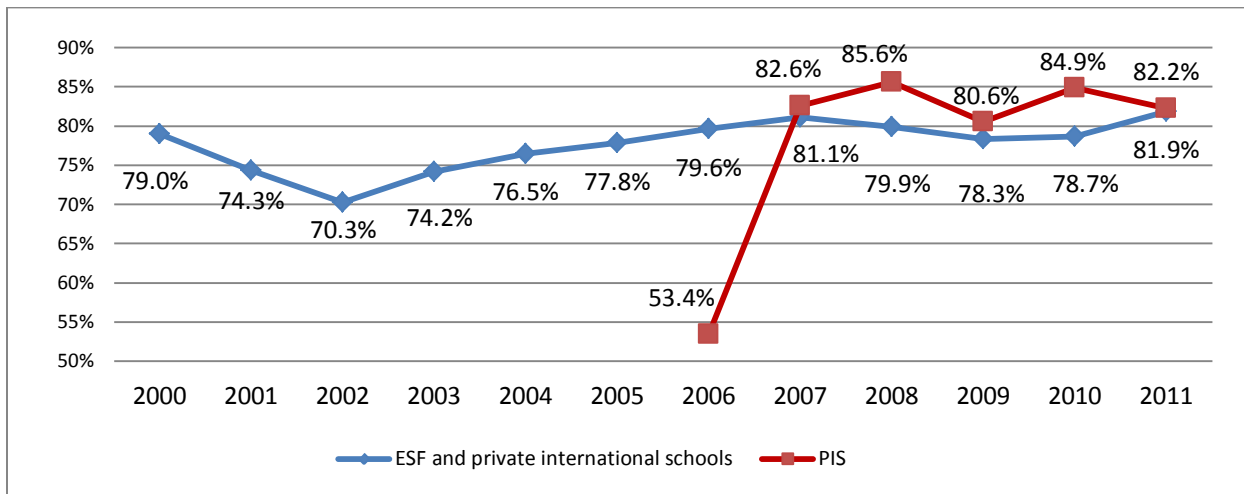
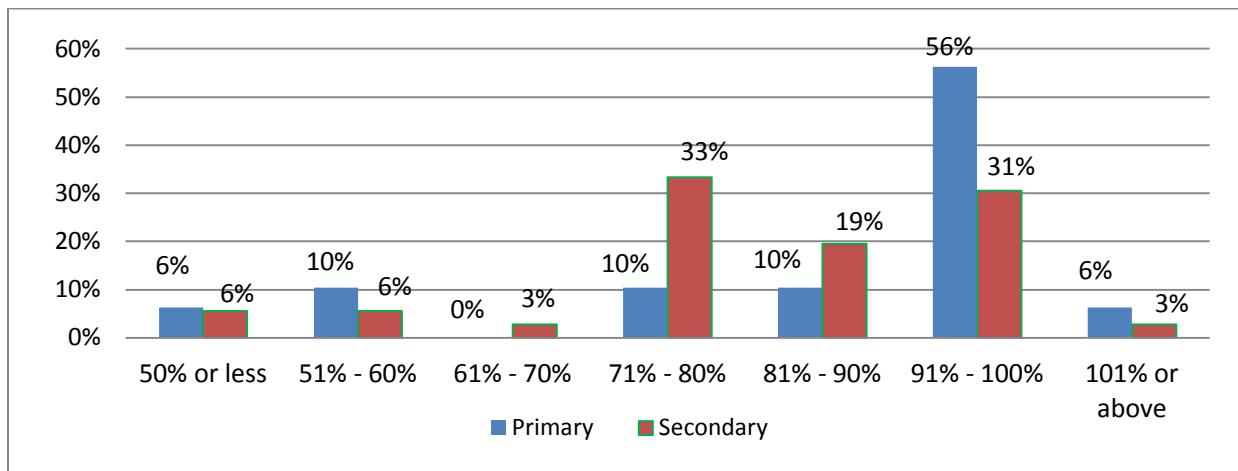


Chart 3.5: Percentage distribution of the average fill-up rate in individual international schools in 2011/12



### 3.3 Average class size

3.3.1 Based on data on the number of operating classes and actual enrolment of individual schools, the average class size of ESF schools, international schools and PIS at primary and secondary level are estimated in Chart 3.6 and Chart 3.7 respectively. At primary level, the average class size ranged from around 30 for ESF schools to around 20 for private international schools while at secondary level, the average class size of ESF schools was around 27 and that for both private international schools and PIS was about 20. Similar to the fill-up rate, there are significant differences in the average class size in different schools (Chart 3.8), possibly in response to the nature of curriculum and demand from applicants.

Chart 3.6: Average class size at primary level in ESF schools, private international schools and PIS from 2000/01 to 2011/12

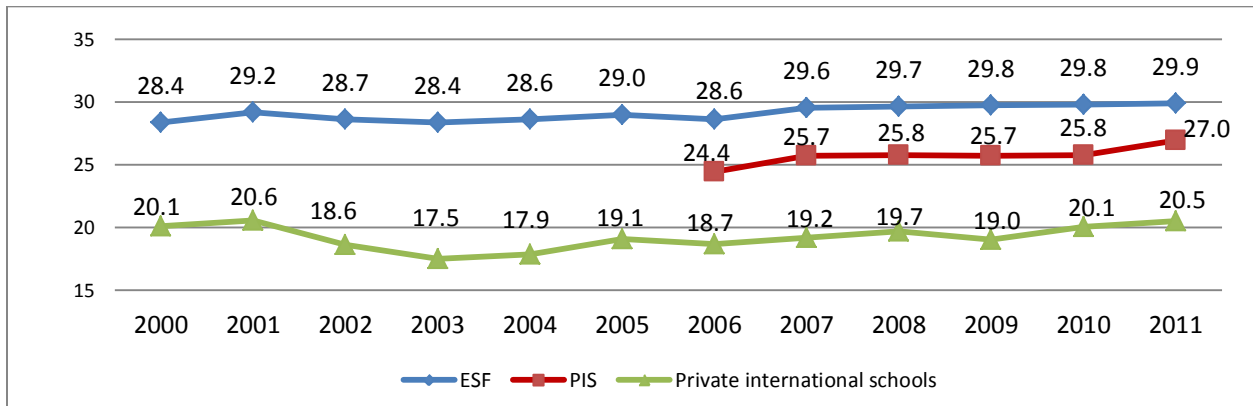


Chart 3.7: Average class size at secondary level in ESF schools, private international schools and PIS from 2000/01 to 2011/12

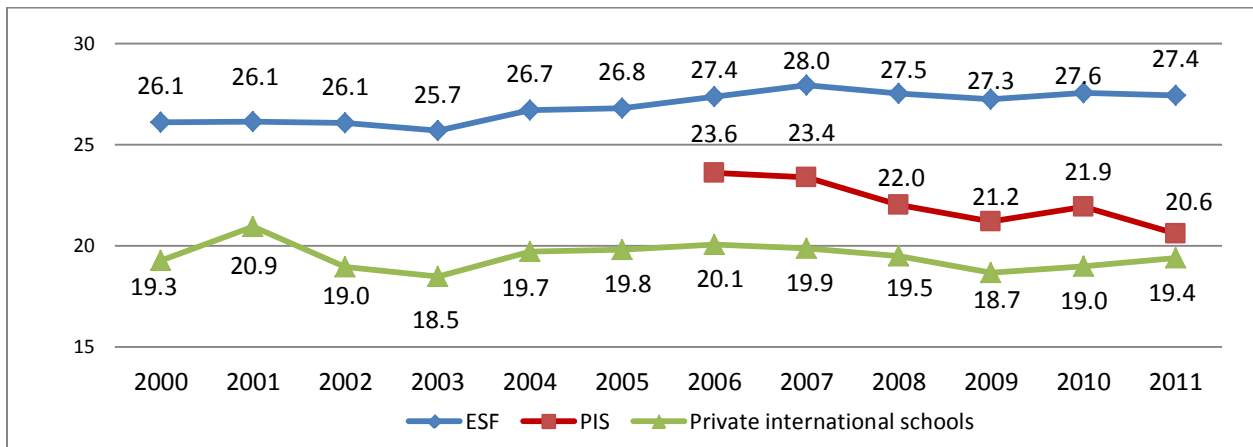
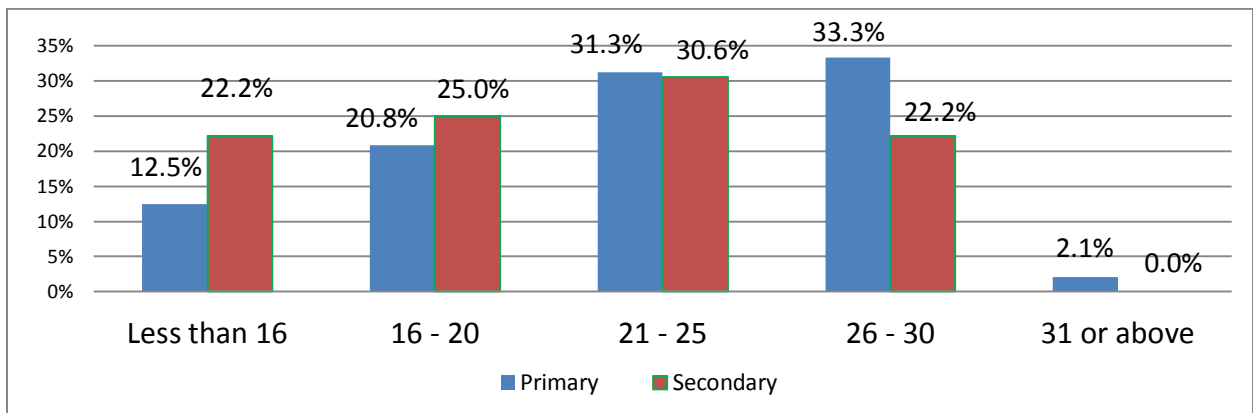


Chart 3.8: Percentage distribution of the average class size in individual international schools in 2011/12



### 3.4 Geographical distribution: School places

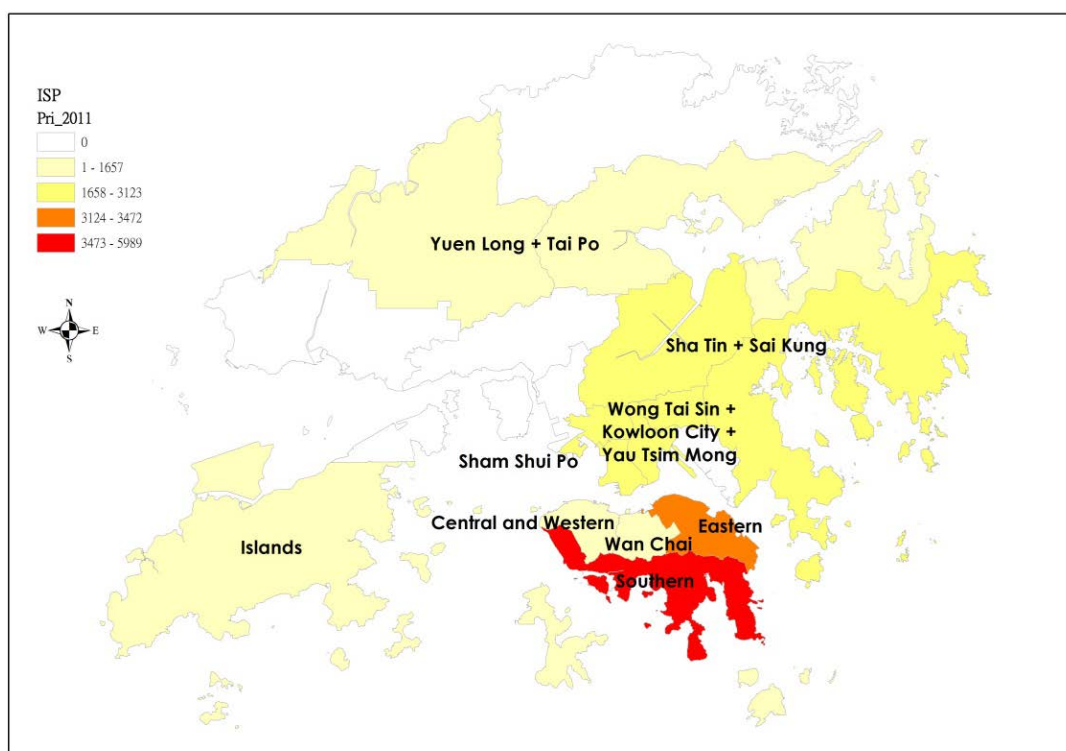
3.4.1 In general, international school places are provided on a territory-wide basis. Understanding geographical distribution helps determine the most suitable location for setting up or re-provisioning of international schools. In 2011/12, 54.3% of the total international school places are on Hong Kong Island, 25.4% in Kowloon and 20.3% in the New Territories.

3.4.2. At the primary level, about 51% of places are provided on the Hong Kong Island, 26% in Kowloon, and about 24% are located in the New Territories in 2011/12 (Table 3.1). More students are enrolled in international schools located in Hong Kong South, followed by Hong Kong East, Wong Tai Sin/Kowloon City/Yau Tsim Mong combined and then Sha Tin/Sai Kung combined (Map 3.1).<sup>3</sup>

Table 3.1: Geographical distribution of international school places at the primary level in 2011/12

District	Provision of places		Enrolment	
	Number	Percentage	Number	Percentage
Hong Kong Island	13,376	50.9%	12,321	51.5%
Kowloon	6,691	25.5%	6,055	25.3%
New Territories	6,201	23.6%	5,527	23.1%
<b>Total</b>	<b>26,268</b>	<b>100.0%</b>	<b>23,903</b>	<b>100.0%</b>

Map 3.1: Number of students enrolled in international primary schools in 2011/12



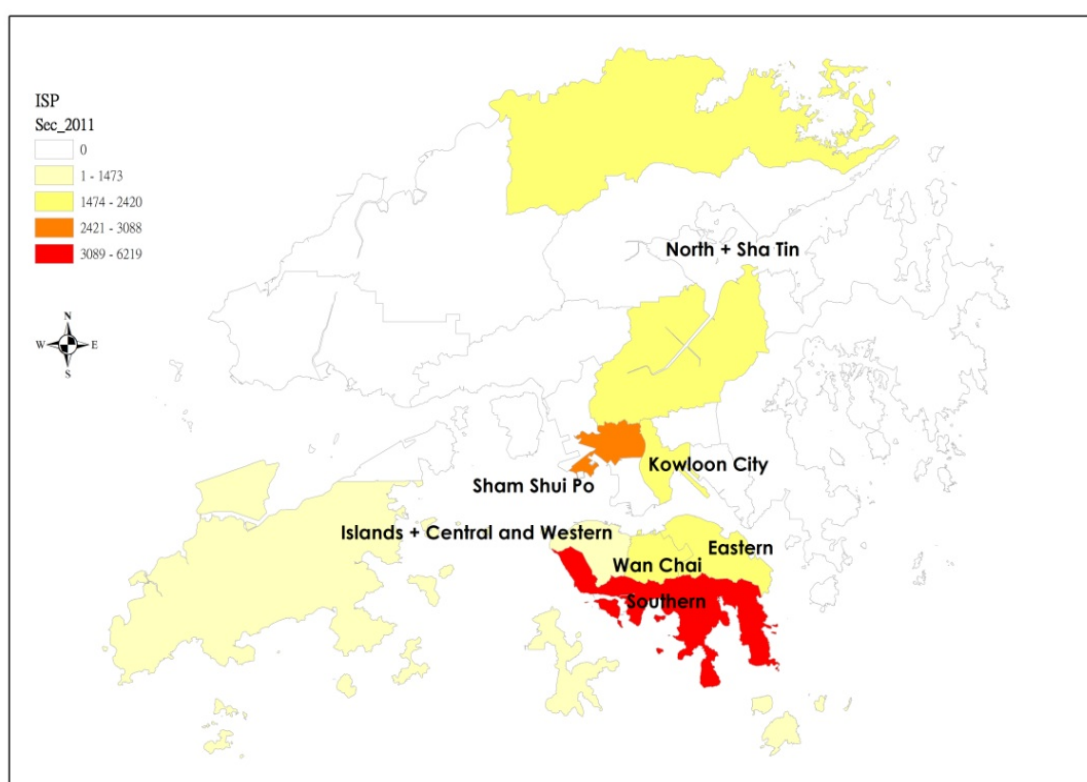
<sup>3</sup> To protect confidentiality of data related to individual schools, districts are merged to ensure that there are at least three schools located in the districts or merged districts concerned.

3.4.3 At the secondary level, about 58% of places are provided on the Hong Kong Island, 25% in Kowloon, and only about 17% in the New Territories in 2011/12 (Table 3.2). There are also more students enrolled in international schools located in Hong Kong South, followed by Sham Shui Po, Kowloon City, Wanchai, Sha Tin/North District combined and Eastern District (Map 3.2).<sup>4</sup>

Table 3.2: Geographical distribution of international school places at the secondary level in 2011/12

District	Provision of places		Enrolment	
Hong Kong Island	13,316	58.1%	11,478	57.5%
Kowloon	5,790	25.3%	4,973	24.9%
New Territories	3,809	16.6%	3,496	17.5%
<b>Total</b>	<b>22,915</b>	<b>100.0%</b>	<b>19,947</b>	<b>100.0%</b>

Map 3.2: Number of students enrolled in international secondary schools in 2011/12



3.4.4 There are variations between districts in the fill-up rate and the average class size (Table 3.3). The fill-up rate is higher on the Hong Kong Island at primary level but in the New Territories at secondary level. The average class size, on the other hand, is higher for schools in Kowloon and the New Territories, at respectively 25.8 and 25.7 at primary level for example, as compared with 23.2 for schools on the Hong Kong Island.

<sup>4</sup> To protect confidentiality of data related to individual schools, districts are merged to ensure that there are at least three schools located in the districts or merged districts concerned.

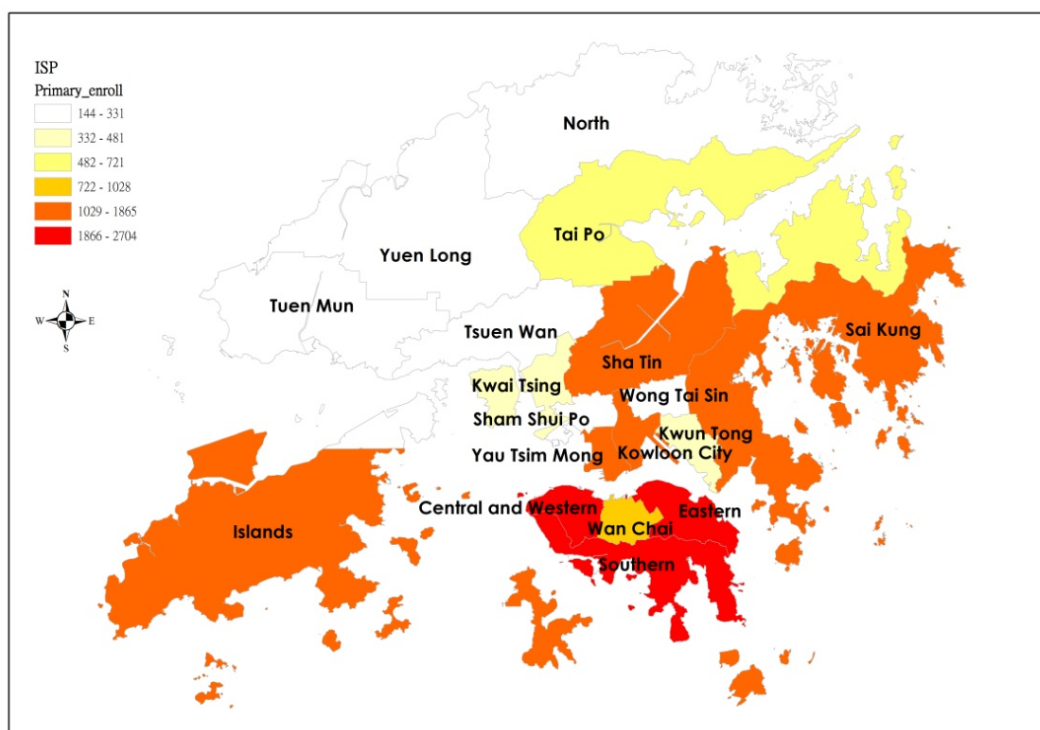
Table 3.3: Percentage of provision of international school places taken up and the average class size in 2011/12

District	Fill-up rate <sup>5</sup>		Average class size	
	Primary	Secondary	Primary	Secondary
Hong Kong Island	92.1%	86.2%	23.2	22.0
Kowloon	90.5%	85.9%	25.8	23.6
New Territories	89.1%	91.8%	25.7	21.1
<b>All districts</b>	<b>91.0%</b>	<b>87.0%</b>	<b>24.3</b>	<b>22.2</b>

### 3.5 Geographical distribution: Place of residence of students

3.5.1 When comparing the geographical distribution of school place and place of residence of students, it is noted that there involved cross-district travelling in attending schools in other districts among some students studying in ESF schools, private international schools and PIS. At primary level, apart from those living on the Hong Kong Island, a considerable number of students live in Lantau, Shatin, Sai Kung, Kowloon City and Yau Tsim Mong where there are relatively less international school places (Map 3.3).<sup>6, 7</sup> Students who live and study in the same catchment area in Hong Kong Island, Kowloon and New Territories are 58%, 46% and 85% respectively (Table 3.4).

Map 3.3: Place of residence of students enrolled in ESF schools, private international schools and PIS at primary level in 2011/12



<sup>5</sup> The fill-up rate in this table is expressed as the quotient of total enrolment and total number of places in international schools.

<sup>6</sup> To protect confidentiality of data related to individual schools, districts are merged to ensure that there are at least three schools located in the districts or merged districts concerned.

<sup>7</sup> Information in respect of 19.7% of students is not available.

Table 3.4: Percentage distribution of international primary school places by district of residence of students in 2011/12

Location of schools	% distribution by district of residence of students						
	Hong Kong Island	Kowloon	Sha Tin, Tsuen Wan, Kwai Tsing	Other parts of New Territories	Outside Hong Kong	Unknown <sup>8</sup>	All districts
Hong Kong Island	58%	4%	0%	4%	0%	33%	100%
Kowloon	10%	46%	15%	20%	0%	10%	100%
New Territories	1%	14%	24%	61%	0%	0%	100%

3.5.2 The distribution on the place of residence among students at secondary level is similar to that at primary level: apart from those living on the Hong Kong Island, Kowloon City and Sha Tin, a significant number of students live in Lantau and Sai Kung (Map 3.4).<sup>9,10</sup> Students who live and study in the same catchment area in Hong Kong Island, Kowloon and New Territories are 50%, 37% and 73% respectively (Table 3.5).

Table 3.5: Percentage distribution of international secondary school places by district of residence of students in 2011/12

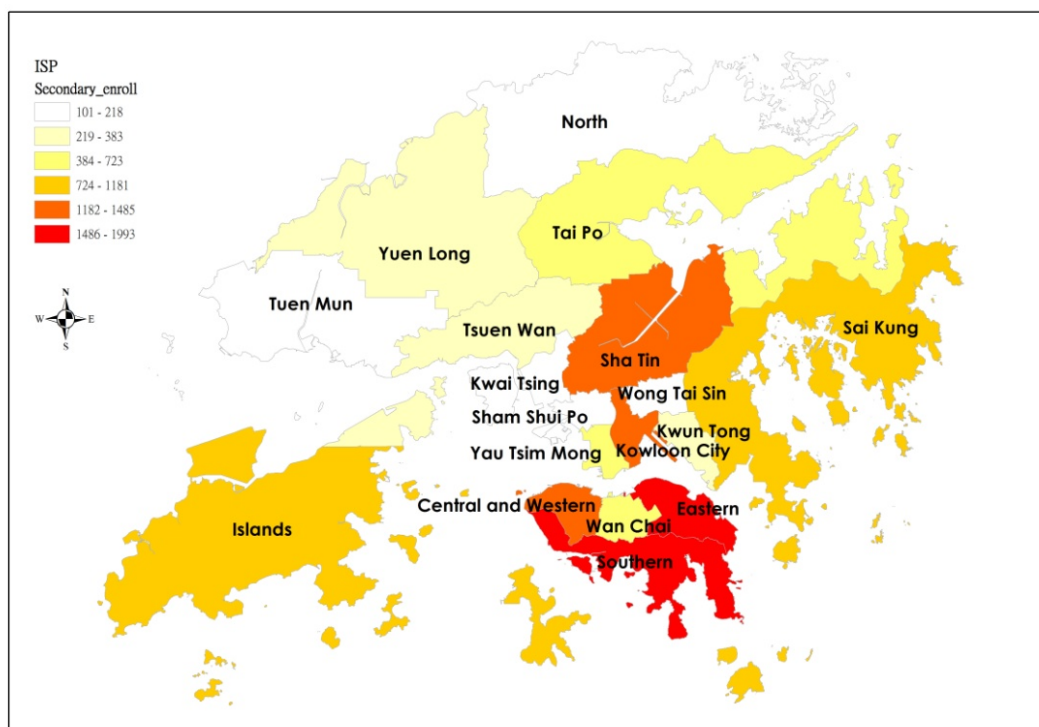
Location of schools	% distribution by district of residence of students						
	Hong Kong Island	Kowloon	Sha Tin, Tsuen Wan, Kwai Tsing	Other parts of New Territories	Outside Hong Kong	Unknown <sup>8</sup>	All districts
Hong Kong Island	50%	4%	1%	5%	0%	40%	100%
Kowloon	5%	37%	14%	25%	0%	18%	100%
New Territories	2%	9%	30%	43%	0%	15%	100%

<sup>8</sup> Caution should be taken in interpreting the above figures owing to high proportions of unknown cases.

<sup>9</sup> To protect confidentiality of data related to individual schools, districts are merged to ensure that there are at least three schools located in the districts or merged districts concerned.

<sup>10</sup> Information in respect of 29.9% of students is not available.

Map 3.4: Place of residence of students enrolled in ESF schools, private international schools and PIS at secondary level in 2011/12



3.5.3 The above shows that the provision of international school places does not completely correspond to the demand in terms of district. Some parents choose to send their children to attend schools they preferred even though these schools are located far away from home. In particular there are indications that there is a shortage of international school places in the New Territories. This may be demonstrated by comparing total enrolment by the location of schools with the number of students by the location of their residence (Table 3.6). Despite a concentration of international school places (54.3%) on Hong Kong Island, only 31.6% of the total international school student population resides on the Hong Kong Island. The proportion of students residing in the New Territories (about 30%) is higher than that enrolled in schools in the same area (around 20%).

Table 3.6: The number of students by location of international schools with the number of students by the location of their residence in 2011/12

	No. of students	
	By location of schools (% to total)	By location of residence (% to total)
Hong Kong Island	23,799 (54.3%)	13,853 (31.6%)
Kowloon	11,028 (25.1%)	6,757 (15.4%)
New Territories	9,023 (20.6%)	12,547 (28.6%)
Outside Hong Kong	--	10 (0.02%)
Unknown	--	10,683 (24.3%)
<b>Total</b>	<b>43,850</b>	<b>43,850</b>

### 3.6 Planned future provision

3.6.1 According to the school survey, 37% of international schools indicated that they planned to implement expansion, redevelopment or relocation projects that would result in over 6,000 additional places in the coming five years. Among these schools, 76% would add a total of 2,177 places at the primary level, and 82% of schools would add 4,078 places at the secondary level (Table 3.7).

*Table 3.7: Planned provision of international school places in 2016/17*

<b>School years starting</b>	<b>Provision of places</b>		
	<b>2011</b>	<b>2016</b>	<b>Increase</b>
Primary	26,268	28,445	2,177
Secondary	22,915	26,993	4,078
<b>Total</b>	<b>49,183</b>	<b>55,438</b>	<b>6,255</b>



## Chapter 4 Determinants of Demand: The Household Perspectives

### 4.1 Overview

4.1.2 This chapter presents the views of parents of local and non-local students on their aspirations of and preference for international school places. The views are mainly collected from the thematic household survey where views of parents of students studying in schools offering local curriculum (i.e. local schools) and those studying in international schools on factors affecting their choice of schools were gauged. Employees of Hong Kong companies were also asked, through the business survey,<sup>11</sup> to indicate the relative importance of factors affecting their choice of school places for their children in Hong Kong. Other findings in the business survey will be detailed in Chapter 5.

### 4.2 Demand for international school places

#### *From students currently attending local schools*

4.2.1 There were 2,353 (or 0.3% of total number of students) students studying in local primary or secondary schools who had ever applied for international school places in Hong Kong. 1,066 of them had applied for international school places at the primary level and 1,287 at the secondary level. 273 students (11.6% of those who had ever applied) were waiting for admission to international schools.

4.2.2 About 2,770 (accounting for 1.6% of all students concerned) students attending local kindergartens or nursery schools in Hong Kong had ever applied for admission to Grade 1 in international primary schools in Hong Kong. On average, one student had applied for 1.49 international schools. Among them, 59.7% (1,655 students) were successful in their applications. Amongst which, about 34% had waited for less than 6 months for admission after submitting their applications. The waiting time was 6 to 12 months for 32% of students and 1 to 2 years for the remaining 34%.

*Table 4.1: Waiting time for admission to Grade 1 in international primary schools*

Waiting time	Local students	
	No.	%
Less than 6 months	563	34.0
6 – 12 months	529	32.0
1 year - < 2 years	563	34.0
<b>Total</b>	<b>1,655</b>	<b>100.0</b>

#### *From students currently attending international schools*

4.2.3 Compared to students studying in local schools, about 72% of them had waited for less than 6 months after submitting their applications before they could be admitted and a further

<sup>11</sup> Care has been taken in interpreting the survey findings in light of significant non-response from employees participated in the survey.

26% had to wait for 6 to 12 months (Table 4.2). It is observed that local students had waited for a longer period of time when compared to non-local students. This is probably because local students could afford to wait for a long period of time or can lodge their applications for admission earlier. For non-local students, they would have to come to Hong Kong before they can submit their applications for admission, and hence the waiting time they can afford is shorter.

Table 4.2: Percentage distribution of students by waiting time for admission


	Waiting time for admission					Total
	Less than 6 months	6 months to <1 year	1 to 2 years	2 to <3 years	3 years or more	
Local students	70.0%	28.0%	0.7%	0.0%	1.4%	100.0%
Non-local students	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
<b>Total</b>	<b>71.7%</b>	<b>26.4%</b>	<b>0.6%</b>	<b>0.0%</b>	<b>1.3%</b>	<b>100.0%</b>

### 4.3 Factors affecting demand for international schools

#### *Factors affecting the choice of schools*

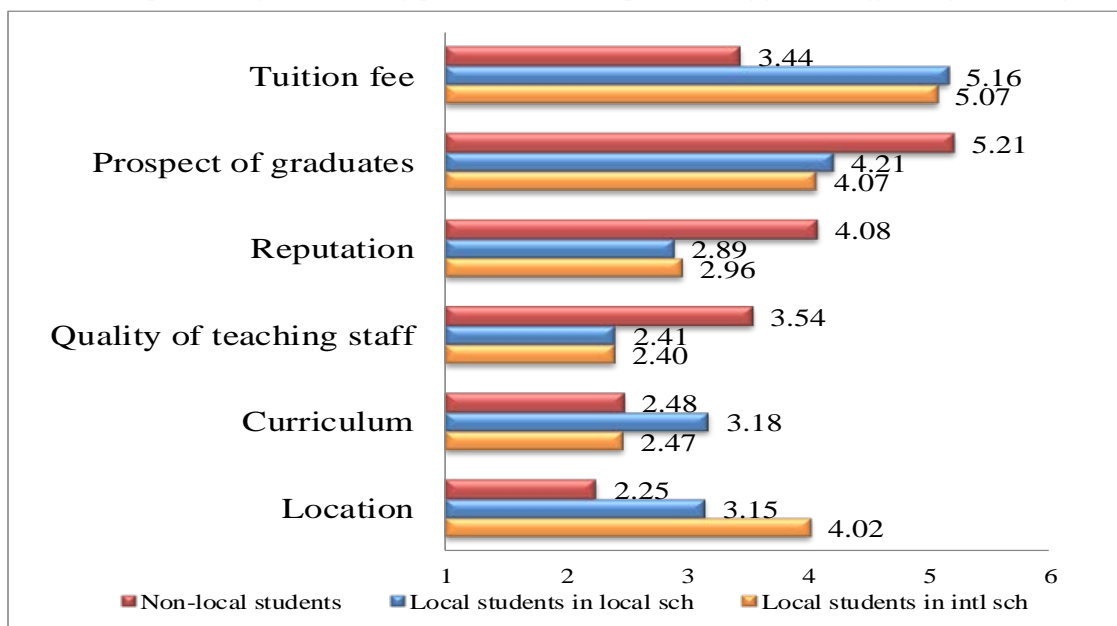
4.3.1 Parents of families with children attending schools at the secondary level or below were asked in survey to rate the level of importance of factors affecting their choice of schools for their children. Factors were rated from “1” to “6”, with “1” denoting “most important” and “6” denoting “least important”. The findings (Table 4.3) revealed that “quality of teaching staff” and “reputation” were considered more important; “tuition fee” and “prospect of graduates” were considered least important.

Table 4.3: Percentage of parents by perceived importance of factors affecting choice of school

Factors	% giving the score of						Total	Mean score
	1	2	3	4	5	6		
	Most important			Least important				
								
Location	22.3	16.4	17.6	15.9	18.3	9.4	100.0	<b>3.20</b>
Curriculum	15.5	20.8	23.0	21.9	11.6	7.1	100.0	<b>3.15</b>
Quality of teaching staff	30.8	29.4	18.6	13.1	5.6	2.4	100.0	<b>2.40</b>
Reputation	23.0	21.3	20.0	20.7	9.8	5.2	100.0	<b>2.88</b>
Prospect of graduates	5.9	8.4	12.6	21.3	37.1	14.7	100.0	<b>4.19</b>
Tuition fee	2.4	3.6	8.3	6.9	17.6	61.2	100.0	<b>5.17</b>

4.3.2 A comparison of the views of parents of local children attending local schools, local students attending international school and non-local students is set out in Chart 4.1. Parents of non-local students, most of whom were attending international schools, in general accorded a higher level of importance to “location” (with a mean score of 2.25), “curriculum” (2.48) and “tuition fee” (3.44), and considered “prospect of graduates” (5.21) and “reputation” (4.08) less important. Parents of local students attending in international schools, on the other hand, considered “tuition fees” (5.07), and “location” (4.02) less important as compared to “curriculum” (2.47), “quality of teaching staff” (2.40) and “reputation” (2.89). Parents of local students attending local schools also considered “quality of teaching staff” and “reputation” more important and “tuition fee” less important.

Chart 4.1: A comparison of the views of parents on the importance of factors affecting choice of school



4.3.3 Views of employees of Hong Kong companies who were holding employment visas or who were naturalized persons were also sought on the relative importance of factors affecting their choice of school places for their children in Hong Kong. As shown in Table 4.4, more than half of them considered “prospect of graduates” (63.7%) the most important factor, followed by “quality of teaching staff” (65.8%) and “curriculum” (63.3%).

Table 4.4: Percentage of respondents by relative importance of factors affecting choice of school

% of respondents	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	Refuse to answer
Location	1.3	1.6	2.3	1.0	92.7	0.9	0.2
Curriculum	2.2	21.0	63.3	10.8	2.2	0.2	0.2
Quality of teaching staff	23.8	65.8	9.4	0.1	0.8	0.0	0.2
Reputation	7.8	0.5	21.3	64.9	0.4	4.9	0.2
Prospect of graduates	63.7	2.6	1.4	22.5	1.1	8.6	0.2
Tuition fee	1.9	8.3	1.8	0.3	2.4	85.0	0.2

### Competitive edge of international schools

4.3.4 How parents view international schools is also a factor affecting demand for international school places. In the thematic household survey, views of children studying in schools at the secondary level or below were sought on their perceived competitive edge of international schools. As shown in Table 4.5, more than half of the parents of local students attending international school considered the “more flexible, interactive learning and not rigid” approach (52.8%) and “opportunities to improve English proficiency” (52.6%) were the competitive edge of international schools. For parents of non-local students, more than half of

them considered “better bridge to education systems overseas” (88.6%), the “more flexible, interactive learning and not rigid” approach (71.6%), “to help children to establish better interpersonal network for the future” (60.2%), “more independent thinking” (60.2%), “better learning atmosphere” (60.2%) and “more relaxed learning and less pressure” (60.2%) were the competitive edge of international schools.

*Table 4.5: Percentage of parents by competitive edge of international schools*

	<b>Local students in international schools (%)</b>	<b>Non-local students (%)</b>
More flexible/interactive learning/ not rigid	52.8	71.6
More independent thinking	17.3	60.2
Better learning atmosphere	18.7	60.2
More relaxed learning/ less pressure	23.3	60.2
To improve English proficiency	52.6	0.0
Better teaching staff	14.6	0.0
Better bridging to educational systems overseas	16.6	88.6
Better job opportunities/prospects	0.7	0.0
To help children to establish better interpersonal network for the future	4.2	60.2
Extensive curriculum	2.1	0.0
More creative learning	0.0	0.0
Curriculum/educational system would not frequently change	3.4	0.0

## Chapter 5 Determinants of Demand: the Business Perspectives

### 5.1 Overview

5.1.1 This chapter presents the views of businesses collected from the business survey,<sup>12</sup> including on the number of staff currently recruited or relocated or planned to recruit or relocate from outside Hong Kong, company's measures to help children of staff with employment visas to attend international schools in Hong Kong, factors affecting decisions on business expansion in Hong Kong or relocation to places outside Hong Kong, and the impact of the provision of international school places on businesses.

### 5.2 Factors affecting demand for international school places

#### *Employees with employment visa and naturalized employees*

5.2.1 About 4% of business establishments enumerated in the survey were currently employing staff with employment visas in Hong Kong (totalled 71,840), and about 10.8% of them had employees who were naturalized residents of Hong Kong previously holding employment visas (totalled 26,605). In both cases, the percentage was higher for large establishments (with employment size 50 or more) and lower for small and medium enterprises (SME) with employment size smaller than 50 (Tables 5.1 and 5.2). On average, each of these business establishments employed 5 staff with employment visas and 2 naturalized staff.

*Table 5.1: Business establishments having full-time staff with employment visas*

	<b>SME</b>	<b>Large</b>	<b>Total</b>
% with no such staff	96.4%	83.0%	95.5%
% with such staff	3.1%	15.2%	4.0%
Average number of staff	3	13	5
% indicating don't know/refuse to answer	0.5%	1.8%	0.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*Table 5.2: Business establishments with full-time staff with employment visas previously but have become Hong Kong Permanent Residents*

	<b>SME</b>	<b>Large</b>	<b>Total</b>
% with no such staff	88.9%	78.3%	88.2%
% with such staff	10.2%	18.1%	10.8%
Average number of staff	2	3	2
% indicating don't know/refuse to answer	0.9%	3.7%	1.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

<sup>12</sup> As the response rate of the business survey is 51%, care should be taken in interpreting the survey findings which may be subject to significant non-response bias.

### *Number of school-age children*

5.2.2 As far as family background of these employees is concerned, 21.6% of employees with employment visas had school-age children and each employee had 1.58 children on average (Table 5.3). Among employees who were naturalized persons, 80.6% of them had school-age children and each employee had 1.24 children on average.<sup>13</sup> While 55.9% of these employees had school age children (under the age of 21), it is uncertain whether all of them brought or would bring their children with them.

*Table 5.3: Statistics on the number of employee with employment visas / naturalized persons with children and the average number of children per employee*

	Employee with employment visas	Naturalized persons	Total
(a) Total no. of such employees	5,685	7,895	13,580
(b) No. of employees with school age children (% to (a))	1,226 (21.6%)	6,364 (80.6%)	7,590 (55.9%)
(c) Number of school age children (i.e. under 21)	1,934	7,902	9,836
(d) Average number of child(ren)	1.58	1.24	1.30

### *Length of stay*

5.2.3 For companies that had recruited or relocated staff from outside Hong Kong, or planned to do so in the coming 6 months, the usual length of stay for such staff was below 3 years (accounting for 61% of companies concerned) (Table 5.4).

*Table 5.4: % of business establishments that have recruited/relocated or plan in the coming 6 months to recruit/relocate staff, including staff with employment visa, from outside Hong Kong*

%	SME	Large	Total
% that have not recruited and will not recruit in the coming 6 months	96.8	76.3	95.3
% that have recruited or will recruit in the coming 6 month	4.1	26.9	5.6
% recruited or will recruit by length of stay in Hong Kong for such staff			
Below 3 years	62.3	59.3	61.0
3 – 5 years	6.0	4.2	5.3
More than 5 years	8.7	2.7	6.3
Not fixed	14.3	29.2	19.2
No information provided	38.1	13.6	30.0
Don't know/Refuse to answer	0.7	0.5	0.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<sup>13</sup> Quite a number of business establishments contacted refused to provide the relevant information given the sensitivity of information related to individual employees concerned. Care should be taken in interpreting the figures.

### *Company's measures to help find international school places*

5.2.4 It is found that only 0.7% of business establishments had measures to help their staff with employment visas recruited or relocated from outside Hong Kong find international school places (Table 5.5). The percentage was much higher for large establishments (9.1%) than for SME (0.1%). In terms of the proportion of staff with employment visas who were employed by companies with such measures, 6.6% of these employees were supported by its company in this regard. The most common arrangement adopted having a special in-house unit to help staff find international school places.

*Table 5.5: Proportion of business establishments with measures to help children of staff with employment visas to find international school places in Hong Kong*

<b>%</b>	<b>SME</b>	<b>Large</b>	<b>Total</b>
No measure taken	96.3	85.2	95.6
Yes, the measures were (multiple responses)	0.1	9.1	0.7
Special in-house unit to help	14.7	94.6	85.9
Hire relocation consultants to help	7.5	3.0	3.5
Corporate debentures of such schools	10.4	1.8	2.8
Others	36.5	1.6	5.4
No comment	3.6	5.7	3.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>% of staff with employment visas employed by companies with such measures</b>	<b>3.6</b>	<b>8.7</b>	<b>6.6</b>

5.2.5 For education allowance, only 0.9% of business establishments provided education allowance to employees' children in attending international schools, or 14.6% of staff with employment visas received such allowance (Table 5.6). It is noted that more than half of SME with education allowance provided education allowance to all staff with children attending international schools in Hong Kong. This notwithstanding, it should be noted that 44% of business establishment did not provide any information on education allowance.

*Table 5.6: Proportion of business establishments providing education allowance to staff for their children's attendance in international schools in Hong Kong*

	<b>SME</b>	<b>Large</b>	<b>Total</b>
% with no education allowance	99.3%	96.2%	99.1%
% with education allowance, which is payable to	0.6%	3.8%	0.9%
All staff whose children are attending schools offering non-local curriculum	53.6%	8.0%	39.7%
Average education allowance per child per month	\$1,037	\$1,862	\$1,088
Staff recruited or relocated from outside Hong Kong	6.5%	22.6%	11.4%
Average education allowance per child per month	\$7,360	\$3,381	\$4,626
Staff employed on expatriate terms	2.0%	7.3%	3.7%
Average education allowance per child per month	\$9,250	\$5,802	\$6,862
Others	0.5%	3.2%	1.3%
Don't know/Refuse to answer	37.4%	59.2%	44.0%
% indicating no comment	0.0	0.0	0.0
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

	<b>SME</b>	<b>Large</b>	<b>Total</b>
<b>Proportion of staff with employment visas employed by companies with education allowance</b>	<b>9.3%</b>	<b>18.2%</b>	<b>14.6%</b>

### 5.3 Impact on business

#### *Recruitment and staff retention problems*

5.3.1 The business survey indicates that about 0.039% of business establishments reported having staff who had resigned and left Hong Kong in the past 12 months because they could not find international school places for their children (Table 5.7). About 0.6% of business establishments failed to recruit in the past 12 months potential candidates who turned down their offer of appointment because these candidates could not find any international school place in Hong Kong for their children (Table 5.8).

*Table 5.7: In the past 12 months, whether any staff in Hong Kong resigned and left Hong Kong because they could not find any international school places for their children*

	<b>SME</b>	<b>Large</b>	<b>Total</b>
% with no such staff	98.1%	86.8%	97.3%
% with such staff, average number of staff	0.038%, 2	0.062%, 2	0.039%, 2
Employees holding employment visas	11.2%	16.6%	11.8%
Average number of employees holding employment visas	1	2	1
Naturalized persons	86.8%	20.8%	79.6%
Average number of naturalized persons	2	2	2
Local residents	0.0%	0.0%	0.0%
Average number of local residents	-	-	-
% indicating don't know	1.8%	13.2%	2.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>



Table 5.8: Proportion of business establishments in the past 12 months failing to recruit candidates who turned down the recruitment offer because they could not find any international school place in Hong Kong for their children

	SME	Large	Total
% with no such candidate	97.2%	80.1%	96.1%
% with such candidates, and the average no.	0.008%, 1	8.2%, 1	0.6%, 1
Candidates holding employment visa	54.0%*	66.9%	66.7%
Average number of candidates with employment visas	1	1	1
Naturalized persons	9.0%	33.0%	32.7
Average number of naturalized persons	4	1	1
Local residents	0%	0%	0%
Average number of local residents	-	-	-
% indicating don't know	2.7%	11.7%	3.4%
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\* In addition, 37% of respondents did not produce any information.

5.3.2 For those employees holding employment visas or naturalized persons who had or would apply for admission to international secondary schools for their children currently attending primary schools in Hong Kong, about 20% indicated that they and their families would leave Hong Kong if there was no international secondary school place available for their children (Table 5.9).<sup>14</sup> On the other hand, if there is a shortage of international primary schools, about half (50.6%) of employees enumerated indicated that they and their family would leave Hong Kong (Table 5.10).<sup>15</sup> About 3.6% indicated that they would stay in Hong Kong while their children would attend primary schools abroad.

Table 5.9: Future plans if no international secondary school place was available for their children

% of employees	Total
My whole family and I will leave Hong Kong	20.1
My family will stay in Hong Kong and my children will go abroad.	0.0
I will stay, but my spouse and children will leave Hong Kong	0.4
Not decided yet	3.9
No information provided	75.5
<b>Total</b>	<b>100.0</b>

<sup>14</sup> Care should be taken in interpreting the finding as it is based on very few sample cases.

<sup>15</sup> Care should be taken in interpreting the finding as it is based on very few sample cases.

Table: 5.10: Future plans if no international primary school place was available for their children

<b>% of employees</b>	<b>Total</b>
My whole family and I will leave Hong Kong	50.6
My family will stay in Hong Kong and my children will go abroad	3.6
Not decided yet	16.7
No information provided	29.2
<b>Total</b>	<b>100.0</b>

### ***Factors affecting business decisions***

5.3.3 More than half of the business establishments cited availability of staff of the right quality (66.2%), staff cost (64.7%), cost of business accommodation (63.9%) and cost of business support services (60.2%) as very important or important factors (Table 5.11). About 21.6% considered availability of international school places as a very important or important factor, while 43.7% considered this not very important or not important at all. It should be noted that 34.6% did not give any view on this question.

Table 5.11: The level of importance of factors affecting the company's decision in business expansion in Hong Kong or relocating your Hong Kong office to places outside Hong Kong

<b>% of business establishments</b>	<b>Very important</b>	<b>Important</b>	<b>Not very important</b>	<b>Not important at all</b>	<b>No comment</b>
Staff cost	35.2	29.5	5.5	15.7	14.1
Cost of housing for staff	16.6	14.4	21.3	19.2	28.5
Cost of business accommodation	18.3	45.6	16.9	9.5	9.7
Environmental quality (e.g. air pollution)	9.3	35.0	19.0	16.1	20.5
Availability of places from schools offering non-local curriculum	6.2	15.4	16.8	26.9	34.6
Cost of business support services	9.7	50.5	9.8	9.3	20.7
Government regulatory burden	1.5	42.7	21.9	10.8	23.1
Availability of staff of the right quality	16.4	49.8	7.5	15.5	10.7

### ***Impact of shortage of international school places on business***

5.3.4 As far as the impact of the shortage of international school places on their business is concerned, less than 30% of companies having staff with employment visa considered that it would have an impact on their business (Table 5.12). The majority of those responded disagreed or totally disagreed that the shortage of international school places would have impact on their business. On the other hand, some 27.8% fully agreed or agreed that they would have difficulties in recruiting or relocating qualified staff from outside Hong Kong, and some 24.4% fully agreed or agreed that it would be difficult to retain staff who had problems finding suitable school places offering non-local curriculum for their children.

*Table 5.12: The extent of the agreement with statements related to impact on the company if the staff has difficulties finding school places offering non-local curriculum in Hong Kong for their children*

<b>Impact on business</b>	<b>Fully agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Totally disagree</b>	<b>No comment</b>
Difficult to recruit or relocate qualified staff from outside Hong Kong	1.3	26.5	28.4	1.1	42.7
Difficult to retain staff who have problems finding suitable school places offering non-local curriculum for their children	1.3	23.1	34.2	1.0	40.3
Slow down the pace of expansion in Hong Kong	0.5	3.4	55.4	3.2	37.5
Reduce the number of staff in Hong Kong who are recruited or relocated from outside Hong Kong	0.9	6.3	51.5	1.5	39.7
Consider recruiting or relocating staff from outside Hong Kong having no child who has to attend schools offering non-local curriculum	1.1	6.4	51.1	1.5	39.7
Consider relocating to places outside Hong Kong where this is adequate provision of suitable school places offering non-local curriculum	1.0	2.1	46.5	6.4	44.0

## Chapter 6 Projection of demand for international school places

### 6.1 Overview

6.1.1 Having regard to the relationship between school enrolment and the size of school-age population, this study had adopted the bivariate time series analysis, which computes the enrolment ratio and projects future enrolment based on extrapolation of past trend on the enrolment ratio. This is a more sophisticated method and is usually preferred to if population data and projection are available by age groups.

6.1.2 The proportion of local students in international schools grew from 11.6% in 2001/02 to 25.6% in 2011/12 at primary level and from 10.7% in 2001/02 to 22.8% in 2011/12 at the secondary level (Chart 6.1). The emphasis on merit-based admission by the majority of international schools (Table 6.1), coupled by increasing popularity of international schools among parents of local students, may explain the increase in the proportion of students enrolled in international schools who are local students.

Chart 6.1: Proportion of students enrolled in international schools who are local students

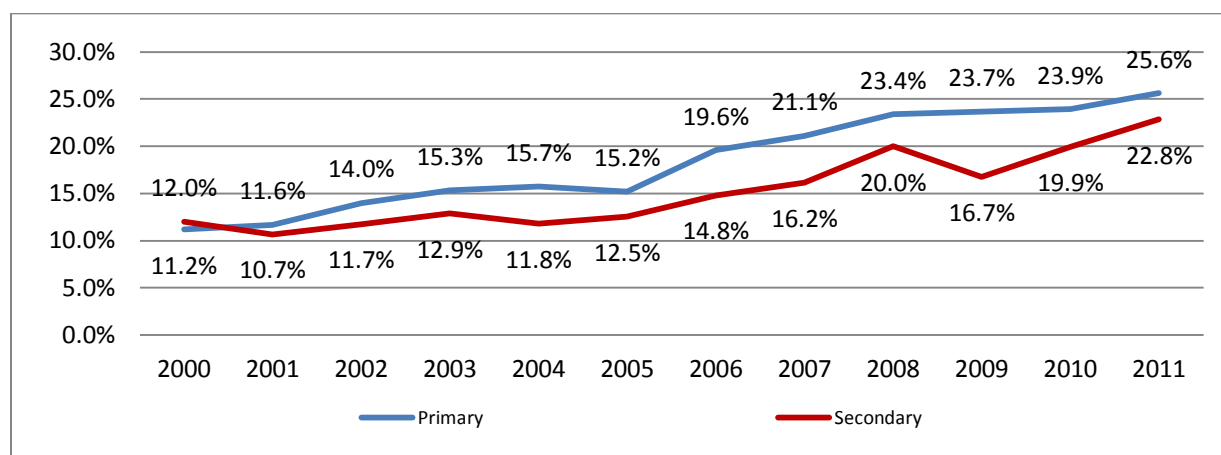


Table 6.1: Whether a higher priority accorded to non-local students in admission

% of schools	Total
No, because:	66.8
Students are admitted on merit-based	46.6
We do not consider the residency status of students in admission	81.8
Yes, higher priority is assigned to non-local students through:	33.2
Students with nationality that corresponds to the curriculum	15.8
Students with nationality that corresponds to the curriculum are placed in a priority queue	26.3
A scheme is in place for non-local students to reserve school places by debenture, nomination rights etc.	5.3
Purchase of debenture, nomination rights etc. by non-local students	0.0
Higher priority will be given to non-local children who have siblings in the school.	57.9

% of schools	Total
Higher priority will be given to non-local children who cannot access local system	31.6
Others arrangement(s)	10.5
<b>Total</b>	<b>100.0</b>

## 6.2 Demand from local students

### *The projection method*

6.2.1 The enrolment-ratio method made use of two separate sets of forecasts: (i) projections of the school-age population which are compiled with reference to C&SD's population projections (refer to mid-year position); and (ii) the projection of the enrolment ratio compiled in the present study. The enrolment ratio is defined as the ratio of students enrolled in primary or secondary sections of international schools to the population in the respective age cohorts (i.e. age 6 to 11 for the primary section and age 12 to 18 for the secondary section). This is expressed by the following formula:

$$R_{\text{local\_xt}} = E_{\text{local\_xt}} / P_{\text{xt}},$$

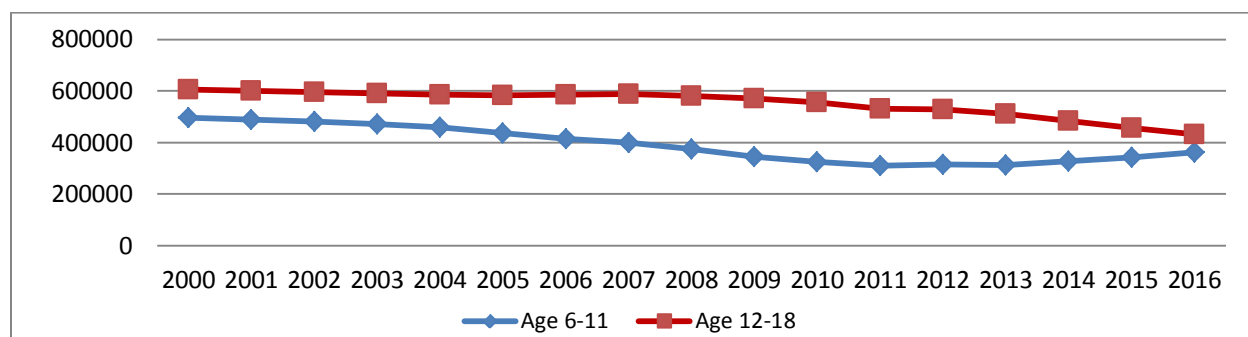
where  $R_{\text{local\_xt}}$  stands for the enrolment ratio of the population at age group  $x$  in year  $t$ ,  $E_{\text{local\_xt}}$  denotes the number of local students in year  $t$  related to age group  $x$ , and  $P_{\text{xt}}$  the total population in the age group  $x$  in year  $t$

6.2.2 By adopting the enrolment ratio method, changes over time in the transition rates between grades, which take into account promotion, repetition and dropout, are accounted for by changes in total enrolment. Any abrupt change in enrolment in a particular grade in a particular year may not be fully reflected in the time series data on total enrolment. In other words, the enrolment ratio method may under-estimate future enrolment if there is an abrupt increase in Grade 1 enrolment. Conversely, this method may over-estimate future enrolment if there is an abrupt decrease in Grade 1 enrolment. As multiplying the projected school-age population by the projected enrolment ratio would produce the projected enrolment, this method takes into account changes in the size of school-age population as well as changes in the proportion of local students aspiring for and successfully enrolled in international schools.

### *Time series data*

6.2.3 For the total population aged 12 to 18, it has been declining steadily from 605,000 in 2000 to 531,000 in 2011. According to the population projections compiled by C&SD, the decreasing trend would continue and the projected total population aged 12 to 18 would reach 431,000 in 2016. For the total population aged 6 to 11, it decreases markedly from 495,000 in 2000 to 310,000 in 2011, or by 37%. The population aged 6 to 11 is projected to increase in in the period from 2012 to 2016, reaching 361,000 by 2016. The actual and projected population for the age groups 6 to 11 and 12 to 18 for the period from 2000 to 2016 is shown in Chart 6.2 below.

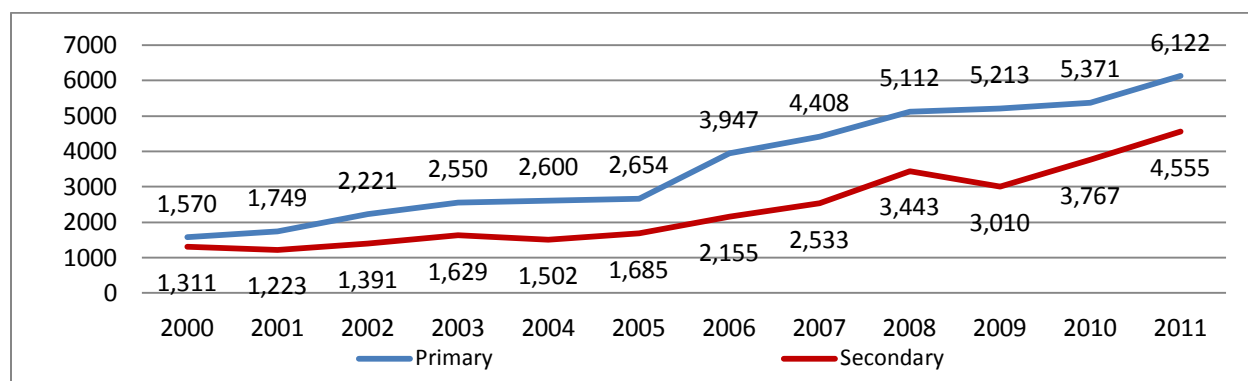
Chart 6.2: Population of age cohort of 6-11 and 12-18, 2000-2011 and projected population, 2012-2016



Source: Hong Kong 2009 Population By-census: Census and Statistics Department  
 Hong Kong Population Projections 2010-2039, Census and Statistics Department

6.2.4 The number of local Hong Kong students attending international schools has increased significantly during the period from 2001/02 to 2011/12, by 4,370 (or +250%) and 3,330 (or +272%) for primary section and secondary section respectively (Chart 6.3).<sup>16</sup> From the enrolment, the enrolment ratios at the primary and secondary levels are computed by dividing total enrolment in international schools by the total population in the relevant age group (Chart 6.4).

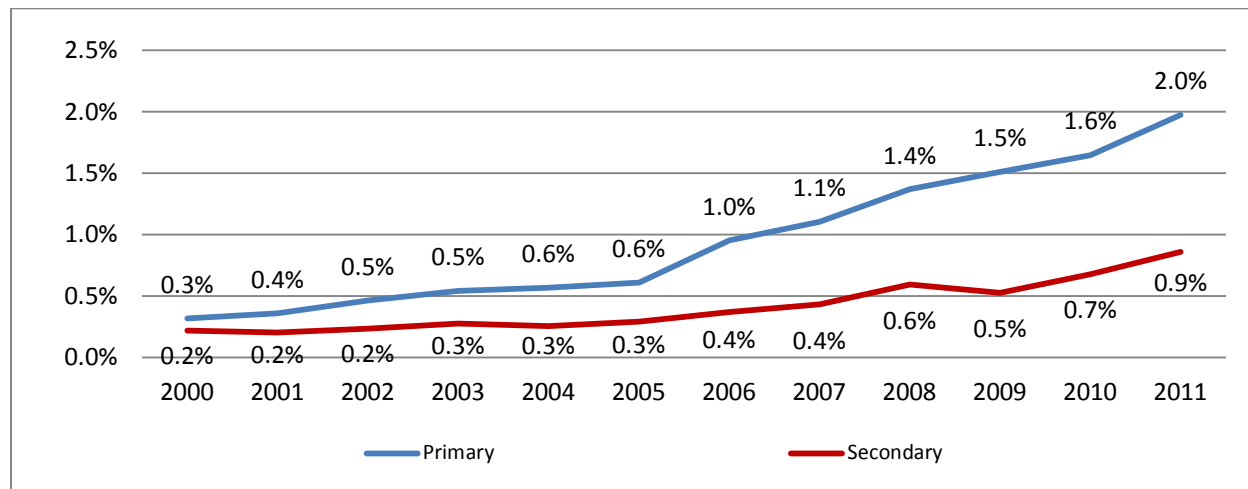
Chart 6.3: The number of local Hong Kong students studying in primary and secondary international schools



Source: Survey reports, Provision of International School Places from 2000 to 2011 excluding 2003

<sup>16</sup> The enrolment statistics in 2003 were not available. Linear regression models were adopted to estimate the enrolment statistics in 2003. The models for the primary and secondary sections are  $E_{pri\_t} = 827.76 + 430.56 t$  and  $E_{sec\_t} = 474.24 + 288.63 t$ .

Chart 6.4: The enrolment-ratios from 2000 to 2011



## Time series models

### Overview

6.2.5 The regression models and time series models,<sup>17</sup> which are two commonly used projection techniques for forecasting, were used in this study in forecasting the enrolment ratios. Regression models can be of various forms, such as linear<sup>18</sup> and exponential<sup>19</sup> and the projected number of students is estimated as a function of variables that are perceived to have an influence on the projection. A time series model is a mathematical model which is used for forecasting data based on a sequence of numerical data collected over some time period. In compiling the forecasts, the most appropriate time series model is chosen after a tedious process of statistical model fitting and model selection. A number of models were examined and four were chosen for the present study<sup>20</sup> namely, linear regression, exponential regression, the “Autoregressive Integrated Moving Average (ARIMA)”<sup>21</sup> and the “Double Exponential Smoothing”.<sup>22</sup> In general, the model with higher the R-squared value ( $R^2$ ), smaller root mean square error (MSE), narrower confidence band and more sensible forecasted trend would be chosen. It should be noted that as

<sup>17</sup> Projections of Education Statistics 2020: Introduction to Projection Methodology, Institute of Education Science (IES), U.S.

<sup>18</sup> Linear regression takes the input signal and fits a linear function  $y = a + bt$  to it where  $t$  is the variable along the x-axis.

<sup>19</sup> Exponential regression takes the input signal and fits an exponential function  $y = a e^{bt}$  to it where  $t$  is the variable along the x-axis.

<sup>20</sup> Other models were investigated, but the results, as well as limitations based on the small number of observations, did not support their use.

<sup>21</sup> A typical ARIMA comprises the autoregressive (AR) and moving average (MA) components, which in ordinary language, refer to the lags and shifts in time series data. It is one of the most popular and widely used statistical procedures for seasonal analysis and adjustment, as well as forecasting. Since most time series are not stationary, a number of steps (e.g. differencing) are required to transform the time series into a stationary one. Thus, an ARMA model comprising the AR and MA components becomes an ARIMA model. As an alternative to ARIMA, the autoregressive model is employed, which uses past time series data as the basis for compiling the forecasts.

<sup>22</sup> Double Exponential Smoothing is also known as HOLT’s trend corrected exponential smoothing which is appropriate when both the level and the growth rate of a time series are changing. The formulae are  $l_t = \alpha y_t + (1-\alpha)(l_{t-1} + b_{t-1})$  and  $b_t = \gamma (l_t - l_{t-1}) + (1-\gamma)b_{t-1}$ . Subsequently, a number of smoothing methods have been examined.

only a time series of 11 years is available, care should be taken in interpreting the projection results obtained from different models.

### *Enrolment in international primary and secondary schools*

6.2.6 By adopting different methods, the projected number of local Hong Kong students studying in international schools were computed by multiplying the projected enrolment ratios with the projected population in the relevant age group. The projected number in international primary and secondary schools are shown in Tables 6.2 and 6.3 respectively. In 2016, the projected number of local students at primary level ranges from about 8,200 to 15,700 whereas that at secondary level ranges from about 4,500 to 7,700.

*Table 6.2: Observed (2000-2011) and projected (2012-2016) number of local Hong Kong students studying in international primary schools*

Year	Exponential smoothing	Linear regression	Exponential regression	ARIMA
Actual				
2000	1,570	1,570	1,570	1,570
2001	1,749	1,749	1,749	1,749
2002	2,221	2,221	2,221	2,221
2003	2,550	2,550	2,550	2,550
2004	2,600	2,600	2,600	2,600
2005	2,654	2,654	2,654	2,654
2006	3,947	3,947	3,947	3,947
2007	4,408	4,408	4,408	4,408
2008	5,112	5,112	5,112	5,112
2009	5,213	5,213	5,213	5,213
2010	5,371	5,371	5,371	5,371
2011	6,122	6,122	6,122	6,122
Projected				
2012	6,604	6,009	7,613	6,496
2013	7,057	6,463	9,021	7,379
2014	7,594	6,995	10,813	7,759
2015	8,173	7,567	13,014	8,654
2016	8,793	8,177	15,710	9,085
R <sup>2</sup> / root MSE	0.963 / 0.0011	0.944 / 0.0014	0.982 / 0.0871	-- / 0.0013



Table 6.3: Observed (2000-2011) and projected (2012-2016) number of local Hong Kong students studying in international secondary schools

Year	Exponential smoothing	Linear regression	Exponential regression	ARIMA
Actual				
2000	1,311	1,311	1,311	1,311
2001	1,223	1,223	1,223	1,223
2002	1,391	1,391	1,391	1,391
2003	1,629	1,629	1,629	1,629
2004	1,502	1,502	1,502	1,502
2005	1,685	1,685	1,685	1,685
2006	2,155	2,155	2,155	2,155
2007	2,533	2,533	2,533	2,533
2008	3,443	3,443	3,443	3,443
2009	3,010	3,010	3,010	3,010
2010	3,767	3,767	3,767	3,767
2011	4,555	4,555	4,555	4,555
Projected				
2012	4,888	4,131	4,633	5,460
2013	5,327	4,260	5,081	6,193
2014	5,699	4,353	5,546	6,682
2015	6,018	4,421	6,040	7,246
2016	6,391	4,540	6,675	7,723
R <sup>2</sup> / root MSE	0.901 / 0.0007	0.866 / 0.0008	0.942 / 0.1225	-- / 0.0010

6.2.7 In view of the highest forecasting error among all models shown above, it is proposed not to adopt the exponential regression model. For the remaining three models, namely the exponential smoothing, linear regression and ARIMA models, the forecasts of which are quite similar at the primary level. It is proposed to adopt the *exponential smoothing model* which has a higher explanatory power (i.e. a higher R<sup>2</sup>) compared with the linear regression model. The ARIMA model is not chosen because it requires longitudinal data with a minimum of forty-five or sixty data points to achieve highly accurate forecasting.<sup>23</sup> Furthermore, exponential smoothing was one of the two major projection techniques adopted by the US National Centre for Education Statistics in projecting enrolment.<sup>24</sup>

6.2.8 By adopting the exponential smoothing model, demand for international primary school places from local students is projected to increase from 6,122 in 2011/12 to 8,793 in 2016/17, or by 2,671 in five years' time. This compares with the actual increase of 2,175 between 2006/07

<sup>23</sup> Chen, Chau Kuang (2008), "An integrated enrolment forecast model", in *IR Applications*, 15: 1 - 18.

<sup>24</sup> US National Centre for Education Statistics, Department of Education (2001), *Projections of education statistics to 2011*, p. 93.

and 2011/12 in the number of local students attending international primary schools. In relative terms, the projected increase between 2011/12 and 2016/17 is 44% in five years' time, compared to the actual rate of increase of 55% between 2006/07 and 2011/12.

6.2.9 Demand for international secondary school places from local students is projected to increase from 4,555 in 2011/12 to 6,391 in 2016/17, or by 1,836 in five years' time. This compares with the actual increase of 2,400 between 2006 and 2011 in the number of local students attending international secondary schools. In relative terms, the projected increase between 2011 and 2016 is 40% in five years' time, compared to the actual rate of increase of 111% between 2006 and 2011.

6.2.10 For projections at both levels, while the choice of model is supported by a careful comparison of estimates of forecasting errors and explanatory power of the different models, any forecasts have to be reviewed and updated from time to time, taking on board changes in both supply and demand, and the impact of any new policy initiatives affecting either the international school or local school systems.

### **6.3 Demand from non-local students**

#### ***The projection method***

6.3.1 The enrolment ratio method is not applicable in forecasting demand from non-local students, as the number of non-local students is not related to the size the local population. Demand from non-local students is largely affected by the number of expatriate staff recruited or relocated by business establishments to Hong Kong, which in turn is related to the level of economic activities in Hong Kong. One of the aggregate measures of economic activity is the Gross Domestic Product (GDP). It is found that the number of non-local students in international schools over the past 11 years is positively correlated with GDP in chained 2009 prices.<sup>25</sup> The correlation coefficients<sup>26</sup> are 0.98 and 0.97 respectively for enrolment in primary and secondary sections, indicating a strong positive correlation with statistical significance at 95% confidence.

6.3.2 For the purpose of projecting demand from non-local students, the projection model chosen was based on forecasting the relationship between the number of non-local students and GDP in chained 2009 prices. The reasons for the choice were that there was a significant correlation between the number of non-local students in international schools and GDP and that the projection of GDP was available. Consideration might be given to the use of other economic variables likely foreign direct investment. However, no projection was available for other economic variables, apart from GDP. According to Government's medium-term outlook for the Hong Kong economy, the trend of GDP growth rate in real terms was forecasted to be 4% per annum from 2012 to 2016, in line with its trend rate over the past decade.<sup>27</sup>

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<sup>25</sup> The preceding-year weighted volume measures of GDP and its components are chain linked to a selected reference year in order to obtain a continuous time series of the chain volume measures of GDP and its components. The GDP in chained 2009 price refers to the chain linked series of the volume measure of GDP where 2009 is selected as the reference year.

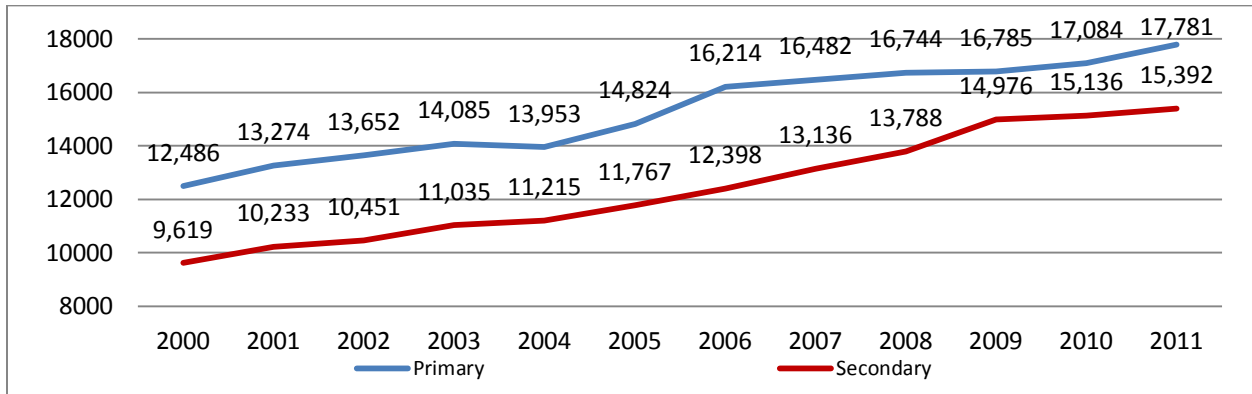
<sup>26</sup> Pearson product-moment correlation coefficient, a measure of the correlation between two variables, gives a value between +1 and -1. A correlation of 0.9 or above is regarded as very high.

<sup>27</sup> 2010 Economic Background and 2011 Prospects (extracts) p. 2

### Time series data

6.3.3 The number of non-local students attending international schools has increased by 5,160 (+50%) and 4,500 (+34%) for the primary section and secondary section respectively during the period from the school year 2001/12 to 2011/2012 (Chart 6.5).<sup>28</sup>

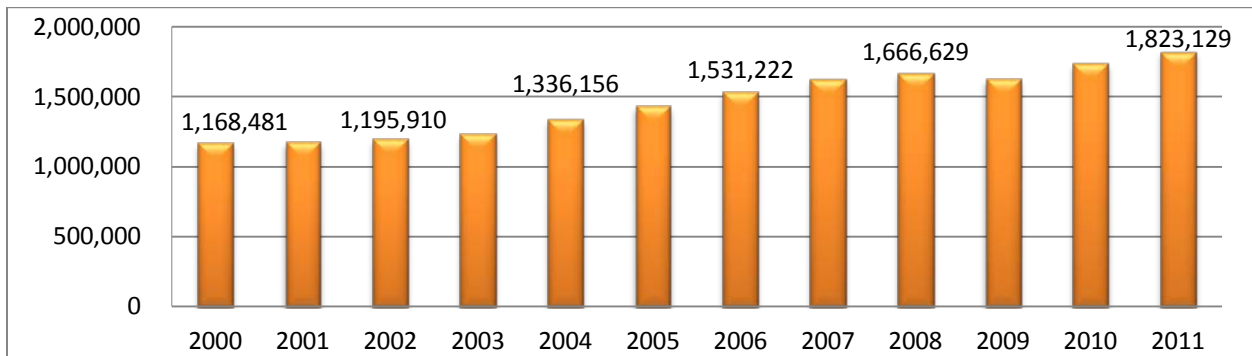
Chart 6.5: The number of non-local students studying in international schools



Source: Survey reports, Provision of International School Places from 2000 to 2011

6.3.4 The GDP in chained 2009 prices for Hong Kong has also been increasing steadily since 2003. The GDP in chained 2009 prices in 2003 and 2011 were about HK\$ 1,230,000 million and HK\$ 1,820,000 million respectively (Chart 6.6).

Chart 6.6: The GDP in chained 2009 prices (HK\$ million)



Source: C&SD

### Time series models

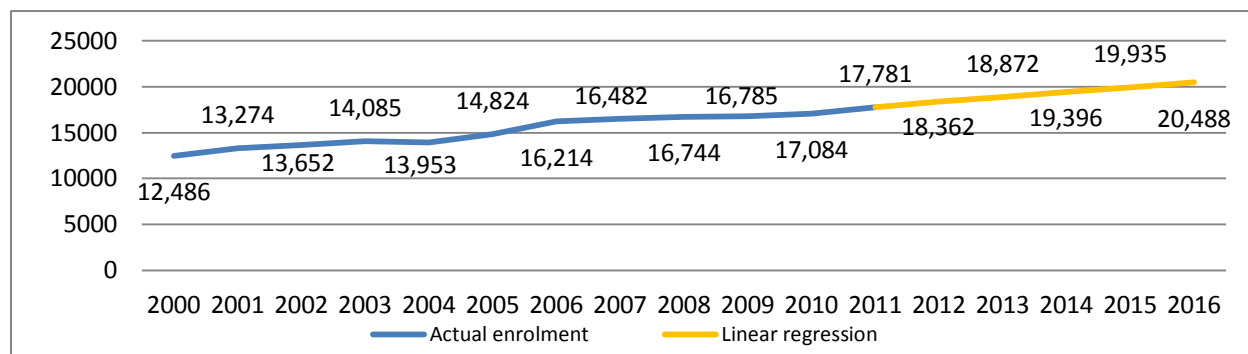
#### Enrolment in international schools

6.3.5 The simple linear regression model was adopted for the projection of the number of non-local students attending international schools, by regressing enrolment on GDP at 2009 prices. As the linear relationship was likely to be related to changes in proportionate rather than

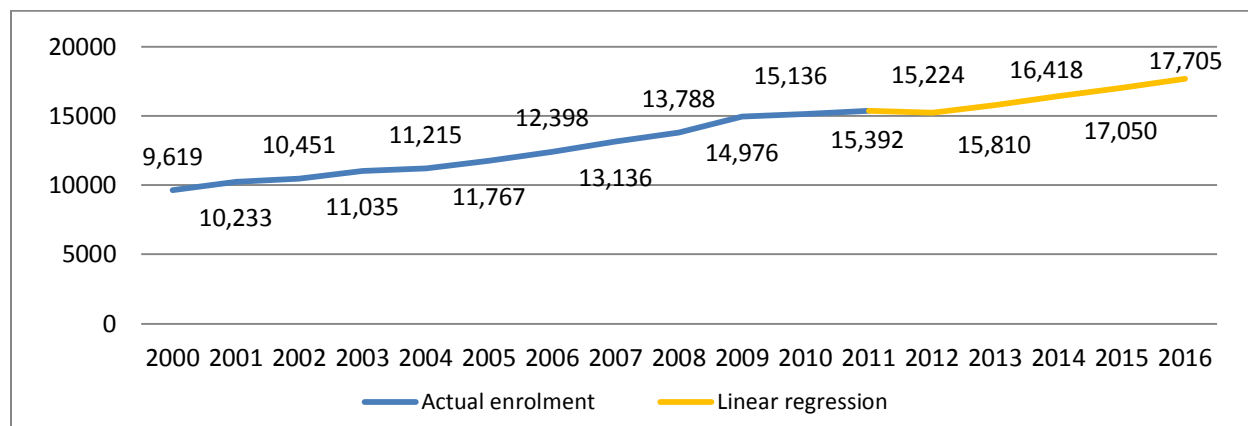
<sup>28</sup> The enrolment statistics in 2003 were not available. Linear regression models were adopted to estimate the enrolment statistics in 2003. The models for the primary and secondary sections are  $E_{pri,t} = 12172.67 + 478.10 t$  and  $E_{sec,t} = 8804.63 + 557.57 t$ .

absolute terms, the natural logarithm was taken for both variables. Based on the linear regression model, the projected numbers of non-local students studying in international schools at primary and secondary levels are set out at Charts 6.7 and 6.8 respectively. The number of non-local students attending international primary and secondary schools was both projected to increase by around 15% in five years' time, at respectively at 20,488 and 17,705 in 2016.

*Chart 6.7: Observed (2000-2011) and projected (2012-2016) number of non-local students studying in international primary schools*



*Chart 6.8: Observed (2000-2011) and projected (2012-2016) number of non-local students studying in secondary international schools*



6.3.6 It is difficult to predict the likely demand from non-local students, as most of them may not be currently in Hong Kong. The profiles of staff recruited or relocated from outside Hong Kong by companies are subject to the companies' choice. This makes forecasting demand from non-local students a precarious exercise. As a reality check of the projection model, based on findings of the business survey discussed in Chapter 5, it is estimated that the number of staff with employment visas or who are naturalized will increase by around 12.9% by 2016. Charts 6.7 and 6.8 indicate that demand from non-local students is projected to increase in five years' time by 2016 by 15% for the primary and secondary sections of international schools. On the basis of such findings, it appears that the forecasts of demand from non-local students presented above are not unreasonable.

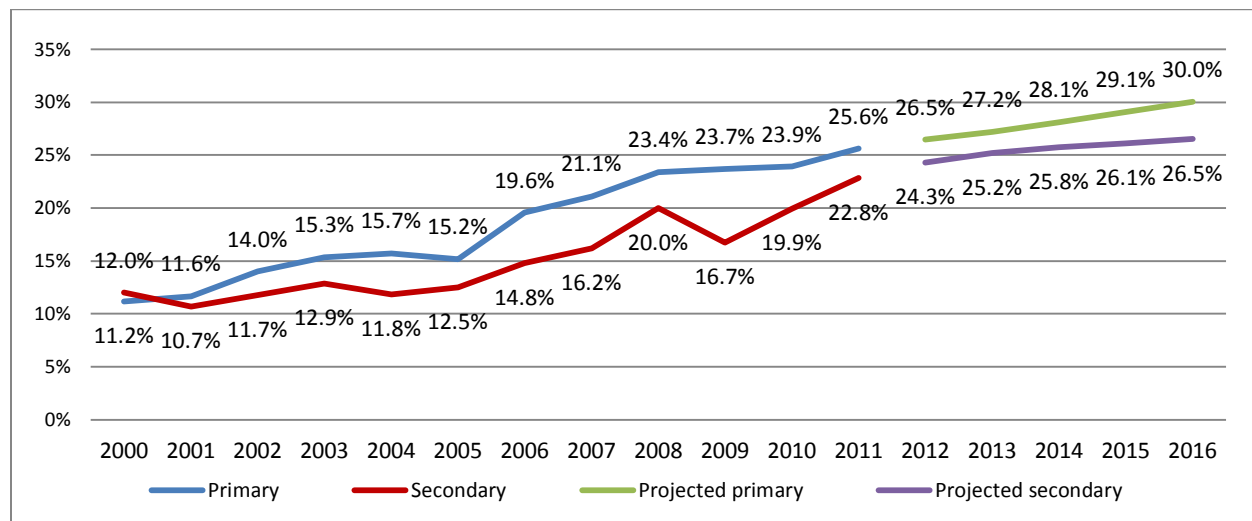
## 6.4 Projection of total demand

6.4.1 Based on separate projections of enrolment of local students and non-local students in international schools, the total number of students in international schools may be computed. The selected projection models together with other projection models are shown in Table 6.4. At the primary level, total demand for international school places is expected to reach 29,281 by 2016, increasing by 5,378 or 22.5%, as compared with 2011. At the secondary level, total demand for international school places is expected to reach 24,096 by 2016, increasing by 4,149 or 20.8%, as compared with 2011. At the same time, the proportion of local students is projected to increase at both levels (Chart 6.9).

Table 6.4: Projected number of local and non-local students studying in international schools (2012 – 16)

Year	Exponential smoothing	Linear regression	Exponential regression	ARIMA
<b>Primary</b>				
2011 (actual)	23,903	23,903	23,903	23,903
2012	24,966	24,371	25,975	24,858
2013	25,929	25,335	27,893	26,251
2014	26,990	26,391	30,209	27,155
2015	28,108	27,502	32,949	28,589
2016	29,281	28,665	36,198	29,573
<b>Secondary</b>				
2011 (actual)	19,947	19,947	19,947	19,947
2012	20,112	19,355	19,857	20,685
2013	21,136	20,069	20,890	22,002
2014	22,117	20,771	21,964	23,099
2015	23,068	21,470	23,090	24,295
2016	24,096	22,245	24,380	25,428

Chart 6.9: Observed (2000-2011) and projected proportions (2012-2016) proportion of local students in international schools



## **6.5 Estimating “un-met” demand**

### ***Overview***

6.5.1 The projection of demand presented above is based on time series analysis of actual enrolment in ESF schools, private international schools and PIS. Actual enrolment represents demand for international school places that has been met, and does not cover demand that has not yet been met. There are broadly four groups of “unmet” demand. Their cause and impact in this study, as well as the resulting estimates of “unmet” demand will be elaborated below.

### ***(a) Local and non-local students on the waiting list***

6.5.2 The number of students on the waiting lists may be over reported as some students were subsequently admitted. A follow-up school survey was conducted to collect from schools information on the number of students placed on the waiting lists who were subsequently admitted by the schools. Findings of the follow up school survey indicate that in 2011/12, 13.8% of primary students and 71.4% of secondary students who were placed on the waiting lists were subsequently admitted by the schools. As schools do not have information on the percentages for the earlier school years, the figures of 13.8% and 71.4% are recommended to be used as proxy estimates for the years 2000/01 to 2010/11.

6.5.3 In addition, some students may have applied for more than one international school. Findings of the thematic household survey show about 1.6% of all students attending kindergartens or nursery schools in Hong Kong had ever applied for admission to Grade 1 in international primary schools in Hong Kong. For those who were not successful, one student had on average applied for 2.24 international primary schools. This number is proposed to be used to adjust the number of students placed on the waiting lists by international primary schools. No information is available on the average number of international secondary schools applied for by local and non-local students and hence no adjustment could be made for statistics on the number of students placed on the waiting lists by international secondary schools.

6.5.4 Based on the above findings, statistics on the number of students placed on the waiting lists for the school years 2000/01 to 2011/12 have been adjusted to take into account over-reporting due to the fact that there were some students placed on the waiting list who were subsequently admitted by schools and that some students had applied for more than one international school. The adjusted statistics are shown in Chart 6.10. It is estimated that the number of local and non-local students on the waiting list of international schools rose from 2,134 in 2001/12 to 3,918 in 2011/12 at primary level and from 200 in 2001/02 to 452 in 2011/12 at secondary level. To better understand the extent to which international school places are over-subscribed, the ratio of the adjusted number of students placed on the waiting list to the total enrolment is shown in Chart 6.11 below.

Chart 6.10: The number of local and non-local students placed on the waiting lists of international schools

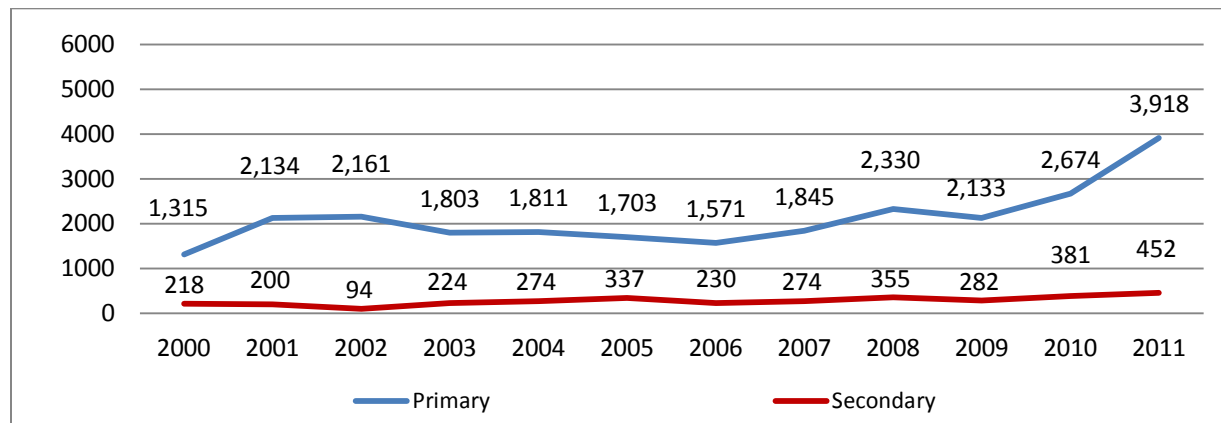
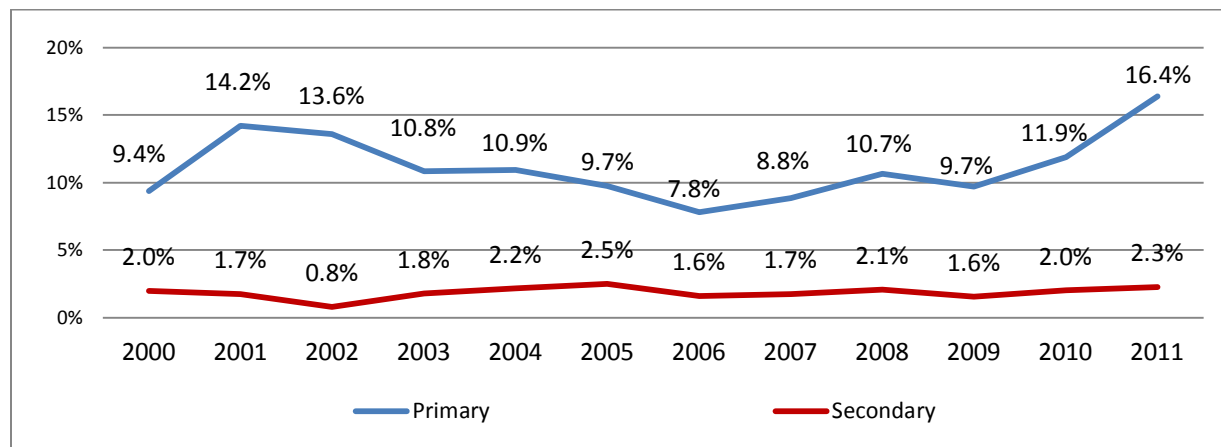


Chart 6.11: The ratio of the number of students placed on the waiting list to the total enrolment



**(b) Local and non-local students failed to gain admission but not on the waiting list**

6.5.5 Some students who have applied for but failed to gain admission to international schools are not placed on the waiting lists. It may be because places are not likely to be available in the near future, or because these students do not meet the admission criteria, or do not have higher priority as those placed on the waiting list. Findings of the thematic household survey show that 0.3% of students studying in local primary or secondary schools who had ever applied for international school places in Hong Kong, of whom 11.6% were still waiting for admission. In addition, about 1.6% of students attending kindergartens or nursery schools in Hong Kong had ever applied for admission to Grade 1 in international primary schools in Hong Kong. 40.3% of them were not successful in their applications.

6.5.6 Based on these statistics, the actual number of students who have applied for international schools but are not successful is smaller than the total number of students placed on the waiting lists by international schools. They are not likely to be significantly large, and they probably do not meet the criteria for admission to these schools. For the purposes of this study, this group of students will not be taken into account in estimating the “unmet” demand.

***(c) Local students who aspire to study in international schools but have not applied***

6.5.7 Local students who aspire to study in international schools but have not applied (i.e. the discouraged applicants) is difficult to trace. Findings of the thematic household survey show that 4.2% children studying in kindergartens in Hong Kong had not applied but planned to apply for Primary 1 in international primary schools in Hong Kong. As kindergartens in Hong Kong cover mainly three year groups from 3 to 5, the percentage of children studying in kindergartens who plan to apply for Grade 1 in international schools each year is likely to be in the order of 1.4% of total kindergarten enrolment. Strictly speaking, this estimate of 1.4% does not represent the “discouraged applicants”, as some children may eventually apply. In other words, the number of “discouraged applicants” is not likely to be significantly large. For the purposes of the present study, “discouraged” applicants are not taken into account in estimating “unmet” demand.

***(d) Non-local students whose parents have declined offers of appointment in Hong Kong or who have left Hong Kong***

6.5.8 As discussed in Chapter 5 above, the business survey indicates that about 0.039% of companies reported having staff who had resigned and left Hong Kong because they could not find international school places for their children. In addition, the business survey also shows that about 0.6% of companies failed to recruit in the past 12 months potential candidates who turned down their offer of appointment because these candidates could not find any international school places in Hong Kong for their children. Given the proportion is relatively small, the fact that the profile of staff will change from year to year, and most international schools admit students on the basis of merits, it is difficult to estimate the number of staff involved and the number of children concerned. It is recommended that rather than taking this as part of the unmet demand, it should be looked into when drawing up remedial measures.

***Estimated “unmet” demand***

6.5.9 Based on the above analysis of waiting list statistics for ESF schools, private international schools and PIS, estimates of “unmet” demand is presented in Table 6.5, along with the summary of projected demand extracted from Table 6.4. In forecasting the ratios in coming five years from 2012/13 to 2016/17, the average ratios for the previous five years from 2007/08 to 2011/12 (see Chart 6.11) are assumed. In other words, the estimated “unmet” demand is assumed at 11.5% of the projected demand at primary level, and at 1.9% of the projected demand at secondary level.

*Table 6.5: Projected demand for international school places*

<b>School year starting</b>	<b>2011 (actual)</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Primary</b>						
ESF, private international and PIS	23,903	24,966	25,929	26,990	28,108	29,281
Estimated “unmet” demand	-	2,871	2,982	3,104	3,232	3,367
<b>Secondary</b>						
ESF, private international and PIS	19,947	20,112	21,136	22,117	23,068	24,096
Estimated “unmet” demand	-	382	402	420	438	458



## Chapter 7 Adequacy of International School Provision, Remedial Measures and Recommendations

### 7.1 Adequacy of international school provision

7.1.1 A comparison of projected demand and future supply of places, which is discussed in Chapters 3 and 6 above, is set out in Table 7.1. It is estimated that by 2016/17, total supply at the primary level will fall short of demand by 4,203 places. At the secondary level, it is expected that there will be a surplus of 2,439 by 2016/17.

Table 7.1: Future supply of and demand, including “un-met” demand, for international school places

School year starting	2011	2016
<b>Primary</b>		
Supply of ESF, private international and PIS places (Table 3.8)	26,268	28,445
Demand (Table 6.4)	23,903	29,281
“Unmet” demand (Table 6.5)	-	3,367
Surplus(+)/Deficit (-)	-	<b>-4,203</b>
<b>Secondary</b>		
Supply of ESF, private international and PIS (Table 3.8)	22,915	26,993
Demand (Table 6.4)	19,947	24,096
“Unmet” demand (Table 6.5)	-	458
Surplus(+)/Deficit (-)	-	<b>2,439</b>

### 7.2 Remedial measures

7.2.1 The Government has introduced a number of measures to increase the supply of international school places, namely facilitating in-situ expansion of existing international schools, allocating vacant school premises and greenfield sites for expansion of existing international schools or development of new international schools, and offering capital assistance in the form of interest-free loan for the construction of school buildings to non-profit-making international schools being allocated with greenfield sites on an application basis.

7.2.2 In the school surveys, views of international schools were sought on the helpfulness of the facilitation measures for the expansion, redevelopment and relocation of their school accommodation. Majority of international schools considered the provision of capital loan for the construction of school premises very helpful or helpful (63.2%), followed by allocation of greenfield sites or vacant school premises close to existing school premises (60.4%) or on the Hong Kong Island (60.1%), and the simplifying of procedures in processing international schools’ applications for school expansion (57.9%) (Table 7.2). They also considered allocating greenfield sites or vacant school premises in the New Territories (45.0%) more helpful than in Kowloon (36.8%).

Table 7.2: Views on Government's measures in helping expansion/ redevelopment/ relocation of schools

	Very helpful or helpful	Not very helpful or not helpful	No comment
Allocation of greenfield sites / vacant school premises in the New Territories	45.0	18.6	36.5
Allocation of greenfield sites / vacant school premises in Kowloon	36.8	21.5	41.8
Allocation of greenfield sites / vacant school premises on Hong Kong Island	60.1	8.1	31.8
Provision of greenfield sites / vacant school premises close to existing school premises	60.4	2.8	36.8
Provision of capital loan for the construction of school premises	63.2	5.4	31.5
Simplifying procedures in processing international schools' applications for school expansion	57.9	0.0	42.2
Other suggestions	15.4	0.0	84.5

### 7.3 Recommendations

7.3.1 The international school sector is extremely heterogeneous. Some schools are much-sought after while others are under-enrolled. Many considerations, generally referred to as parental preference, are involved. These may include, for example, the perceived quality, geographical location, curriculum and the region / culture of the schools. The grade levels and economic vicissitudes are also relevant. The demand for international school places is highly volatile, and to a certain extent, supply-stimulated. To address the demand, actions should be taken by both the Government and international schools. The issue could also be looked into from a business perspective.

#### *Strengthening support from the Government*

7.3.2 In short and medium term, it is recommended that steps be taken to facilitate international schools with in-situ expansion and the leasing of school premises by increasing the transparency of the application procedures. For longer term, future allocation of greenfield sites for international schools should take into account the geographical distribution of students to minimize as far as possible travelling by students to attend schools.

7.3.3 To address the difficulties encountered by the schools in obtaining sufficient money to finance school expansion, it is recommended that the government should review the current arrangement for land grant and the provision of interest-free loan with a view to facilitating international schools in financing their school expansion projects. On the other hand, the regulatory and administrative procedures followed by different government departments in processing applications for school expansion by international schools should be examined with a

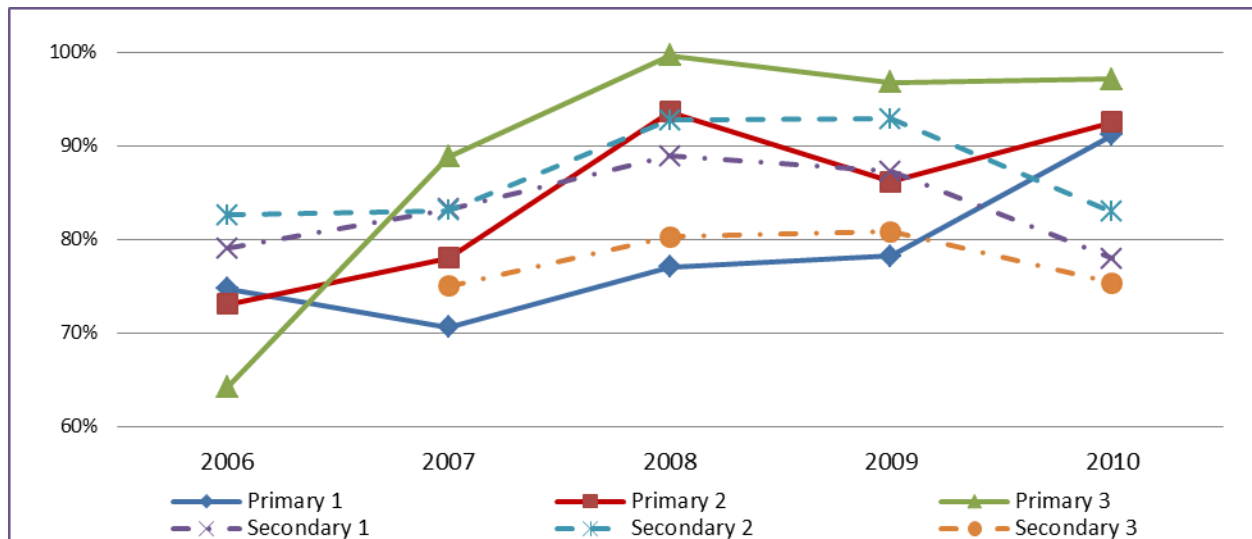
view to exploring room for further enhancing improving timeliness, responsiveness, transparency, efficiency and effectiveness, from the perspectives of international school sector as service recipients.

***(b) Helping hand from the school sector***

7.3.4 It is recommended that international schools in Hong Kong should consider sympathetically the schooling needs of children of overseas families coming to Hong Kong for work or investment. They may not meet the admission application cycle as they come to Hong Kong with their parents at short notice. Most schools indicated that they welcomed students of all nationalities and ethnicities yet admission was based on merits, which often required the meeting of certain English standards. Thus, for children of foreign nationals whose mother-tongue was not English, they might have difficulties meeting the admission requirements.

7.3.5 Furthermore, as illustrated in the fill-up rate of three international primary and three international secondary schools from 2006/07 to 2010/11 in Chart 7.1, it is apparent that there is to certain extent flexibility in the number of students admitted each year by the international schools. It is recommended that international schools make use of this flexibility in exercising discretion to accord priority admitting non-local children whose parents are recruited or relocated by Hong Kong companies from outside Hong Kong. On the other hand, schools in Hong Kong, especially those adopting English as the medium of instruction or offering non-local curriculum, could create a more inviting environment to encourage non-local students to apply for admission.

*Chart 7.1: Fill-up rate in six international primary and secondary schools, 2006-2010*



*(c) Provision of international school places: a business case*

7.3.6 Several representatives of businesses admitted that business needs came first in decisions related to location of companies. They considered Hong Kong was best placed for doing business in Asia, especially China. However, they considered businesses had to take care of the wellbeing of their staff and schooling for children was most important for families of their staff. There was a perception among non-local staff that there was a shortage of international school places. This notwithstanding, Hong Kong has taken great strides in business facilitation and achieved remarkable results in improving business environment in Hong Kong. It is heartening to note that Hong Kong was named by International Institute for Management Development (IMD) in 2012 as the most competitive economies in the world, ahead of USA, Switzerland and Singapore.<sup>29</sup> To build a more business-friendly environment, it is recommended that the planning of the provision of international school places in Hong Kong should be regarded as not only as an educational issue, but also a business one, as it will affect not only the wellbeing of families whose children will benefit from studying international schools, but also the reputation and competitiveness of Hong Kong as an international business centre.

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<sup>29</sup> <http://www.imd.org/news/IMD-announces-its-2012-World-Competitiveness-Rankings.cfm>, retrieved on 25 July 2012.