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Singapore Indians at the Millenium: Demographics and Developmental Issues

SINGAPORE: A DEMOGRAPHIC LABORATORY

Introduction

THE Southeast Asian land and insular mass between the Indian subcontinent and China has witnessed trade and labour migrations for centuries, and virtually all cultures within this entity have been influenced by Hindu and Buddhist doctrines, ideologies, art, religion and philosophy. At the present, the cultural balance is all too permeated with Indian influences but subsumed as localised folklore and national identity. Within this cultural diversity, Malaysia and Singapore contain the largest pockets of Indian minorities in the region and who would be directly classified as peoples of the Indian subcontinent (Sandhu and Mani, 1993). The non-Indian Southeast Asians who have been influenced by Indian culture or imbibed in it, are considered a people apart despite the ever-present symbiosis (we are excluding the overseas Chinese or non-Asians who are also found in this region).

Singapore

After Malaysia, Singapore contains a significant Indian minority (some 7 per cent) besides Chinese (77 per cent), Malays (15 per cent) and a residual mix of races and nationalities (1 per cent). The population structure in these countries resembles a demographic laboratory, in that they would form significant samplings from their lands of origin (motherland), though separated by generations, time and socio-economic development (Table 1).

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TABLE 1: KEY INDICATORS OF SINGAPORE'S MAIN ETHNIC POPULATIONS, 1980 AND 1990

Category	*Indians*		*Malays*		*Chinese*	
	1980	*1990*	*1980*	*1990*	*1980*	*1990*
Total Population ('000)	154.6	229.5	351.5	408.0	1856.2	2252.7
Singapore Residents	143.4	190.9	328.7	382.7	1787.8	2102.8
Non-Residents	11.2	38.6	22.8	25.3	68.4	149.9
% Non-Residents	7.2	16.8	6.5	6.2	3.7	6.7
Ethnic Composition (%)						
Total Population	6.4	7.6	14.6	13.5	76.9	74.7
Residents	6.3	7.1	14.4	14.1	78.3	77.7
Non-residents	8.5	12.4	17.3	8.1	51.9	48.2
Median Age (Years)*	24.8	29.5	21.6	26.2	24.9	30.6
Persons* aged 60+ (%)	6.2	9.7	4.8	7.2	8.0	9.4
Total Dependency Ratio* (%)	46	50	56	56	54	46
Under 15 (YDR)	37	35	49	45	42	32
60+ (ODR)	9	15	7	11	12	14
Proportion Single' (%)	9.9	16.0	10.2	12.2	14.1	9.2
Mean No. of Children[2]	3.4	2.7	3.9	3.2	3.4	2.8

Sources: Culled from census reports. *Notes:* (*) for resident population.

1. Among females in ages 30-39, resident population
2. Ever borne per ever-married females, residents

Ethnic classifications are used in the census enumeration in these countries, including dialect and linguistic groupings. Thus, each community has been demarcated statistically into regional racial types: Tamils, Punjabis, etc. for Indians and Hokkien, Cantonese etc. for Chinese, and so forth. Despite the political influence of the majority ethnic groups (Malays in Malaysia, Chinese in Singapore), the Indian people practice their unique cultures and languages within a constitutional framework.

In the Singapore context, Indians constituted 229.5 thousand persons according to the 1990 Census reckoning, of which 38.6 thousand persons would be "temporary" residents or guest workers on employment and professional visit passes. Of the total population in 1990, Chinese comprised 2,252.7 thousand persons and Malays some 408.0 thousand persons. The rest is made up of Eurasians, Japanese, Arabs and other minorities such as Americans, UK citizens and even the Balkans. According to the 1871 Census, Indians numbered some 11.5 thousand (comprising almost 12 per cent of total population) which has declined to 6.4 per cent by 1980. In 1995, Indians constituted only 7.1 per cent (of the *resident* population). In the context of an official policy on

ethnic balance as a status quo, the proportionate share of Indians is not expected to increase beyond the present ratio', unless there is a shift in official policies.

The Sub-continent in a Microcosm

Southeast Asia has been attractive to trading communities, settlers, soldiers, invaders and immigrant labour communities throughout the entire Christian era and earlier. The culture, religions, icons, artifacts and culinary arts of Southeast Asian countries have Indian bases (Sandhu, 1969). In the last 150 to 200 years, Indians came mainly to Malaysia and Singapore to work on the plantation and public infrastructure sectors of the colonial administration, as well as to defend, educate and trade. At present, despite immigration restrictions, labour from the Indian subcontinent is found in various labour-intensive sectors on two-year block work permits. These workers would be expected to return home, unless they acquired further training or trade certificates in Singapore's vocational and technical institutes to be classified as skilled workers who can continue to work locally in the long term. At the same time, a substantial number of Indians have also been issued professional employment passes as skilled persons eligible to apply for permanent resident status: engineers, computer professionals, finance personnel, teachers and the like. There is a higher probability for these skilled professionals to become permanent residents, and eventually citizens, thus becoming eligible to purchase public flats and enjoy other civil rights. Thus, the two waves of Indian immigrant workers contribute to the Singapore economy, only because of their technical proficiency, productivity and their ability to assimilate into Singapore society. Undercurrent in this influx is the cost-effectiveness of Indian workers and professionals, in that employers want lower operating costs while there is a willingness among the Indians to work abroad (Shantakumar, 1995). When both the 'pull and push' factors are conducive, backed up by sustained government policy, we may expect continuous labour immigration into the region.

The Indian diaspora currently resident within the island city-state of Singapore would generically refer to the diverse peoples of the sub-continent: Indians, Pakistanis, Bangladeshis, Sri Lankans, Nepalese, Bhutanese, Maldivians and Sikkimise. Censuses from 1970 enumerate these peoples collectively as "Indians", while distinguishing them by place of origin, country of birth and languages spoken. Historically, unlike the Chinese, Indians were able to visit their homeland and establish or re-establish family ties, sometimes leaving behind their immediate families (certainly true of present-day unskilled workers). Those who were able to settle in their adopted lands through citizenship rights are truly Singapore citizens, as much as the Chinese or the Malays, thus contributing to the economy - many are third or fourth generations (Arasaratnam,

'The non-resident Indian guest workers are not immigrants, and are expected to return to their homeland at the end of their contractual tenure.

1970). Also, the present situation provides encouragement to human resources linkages and complementarities and human skills transfers arising from the economic liberalization in India and Singapore's globalization process (Shantakumar, 1995). Since the Indians have a vital role and *link* in Southeast Asian economic development through Singapore, it becomes necessary to analyse their demographic and socio-economic profiles in the political economy of Singapore and their status at the end of the millenium.

THE DEMOGRAPHY OF SINGAPORE INDIANS

Indians in Singapore Context

In recent years, an avowed government population policy preserves the ethnic balance as a status quo, in the ratio ofChinese:Malays:Indians:Others at 76:15:7:2 per cent. There seems to be a (mistaken) belief that such an ethnic balance provides social and economic stability. Perhaps, the underpinning behind this policy could be the principle of majority survival and wealth maintenance as well as to preserve cultural identity. Thus, ethnic ratios are guided *by flat* and we may consequently expect policies (social, economic and otherwise) to be in tune. Earlier projections (Shantakumar, 1988) indicated that the largest minority group (the Malays) would increase their share at the expense of the majority Chinese, in about 50 to 70 year's time, provided current differential fertility transitions and trends continued. It is plausible that these prognostications might have had some effect on policy formation, while also possibly affecting the Indian ratio. Indeed, Chinese actually constitute 77 per cent and a drop of a few percentage points may be tolerated to benefit the minority populations.

Also inherent in the population policies in Singapore is the emphasis on eugenics, encouraging skilled Indians to settle in Singapore. Without casting any aspersions on this ethos of eugenics, the Indian gene pool could benefit from an influx of skilled Indian families, with long-run benefits. Perhaps, there is an incentive in encouraging highly-skilled Indian workers and professionals. Incidentally, the officially sanctioned influx of skilled immigrants (all countries of origin) is about 35,000 persons in annual terms, excluding families. Some 7 to 10 per cent of these would be expected to be Indians. And, Indian Singaporeans will have to share minority status as a status quo, but with constitutional rights guaranteed. In fact, despite the ethnicities and races within the Indian community, Tamil is constitutionally recognized as one of the four official languages in the country (others are English, Mandarin and Malay, the last which is the national language since independence but not overtly emphasized).

The different ethnic groups are characterized by differential demographic dynamics that resulted from different starting points in the demographic transition of Singapore (Shantakumar, 1988). By sheer majority, the Chinese would parallel total population trends, and for outsiders, Singapore may resemble a "Chinese" country despite the

western orientation of the economy. Demographic transition has been rapid and would reach stable but low growth through below replacement levels by 2020 or 2030. Compared to the Chinese, Indians (and Malays) have yet to complete the demographic transition: rates of infant, child and general mortality and fertility are generally higher than for Chinese. Modernization and interventionist population and social policies have led to virtually below replacement fertility for the Chinese, with a ten year lag for the non-Chinese. Stable sex-ratios and age-structures characterize Singapore Chinese as a demographically and economically developed society, while Indians have lagged in terms of sex-ratios in favour of males (especially beyond ages 50) and fertility decline. Their cultural heterogeneity would translate into a longer gestation period for socio-economic development within a competitive environment. Despite the recognition of Singapore Indian contributions to economic growth, the Indian population needs to traverse many developmental spaces and transition mechanisms to equal Chinese status attainment. Minority privileges being non-existent within a meritocratic system, the country provides challenging opportunities in education, social status, occupational distribution, incomes and wealth (Table 2).

Population Composition

Censuses from 1871 have documented Indian immigration into Singapore (and Peninsular Malaysia). As contractual immigrants in early years, Indians managed to return to their motherland to rejoin their families left behind. Later migrations encouraged permanent settlement in the receiving countries. As a result, a continuous stable settlement pattern of families has never been the norm: very early immigrants were indentured labourers, prisoners or traders, and womenfolk had not accompanied them. Such practices lasted well up to the late 1930s. If the sex-ratio (males to females) serves as an index of familial formation and stable settlement (Table 3), it is still weighted in favour of males, albeit on a decline. In fact, the Indian sex-ratio did not promote a higher population ratio, due to voluntary or enforced return migration policies of the (then) colonial government (Shantakumar, 1986). For instance, in 1947 there were 299 males for every 100 females, declining to 108 in 1995. For ages 50+, the comparative ratios are 553 and 143 for the respective years. In respect of Indians below 50 years of age, there is more sex-ratio stability. Stable growth in the Indian population would be expected from the settled (or resident) families through the modernization process, lower fertility and socio-economic advancement. Also, their lagged fertility decline in an urban Singapore would not encourage any significant increase in the population ratio.

The entire Indian sub-continent is represented (Table 4), with Tamils as the major grouping. Indians in Singapore represent different linguistic backgrounds and differential socio-economic levels as well. The vast majority are from southern India. Many northern Indians and some southern Indians (Chettiars) were traders and businessmen in the early

TABLE 2: SELECTED DEMOGRAPHIC AND SOCIAL INDICATORS, 1980-1995

Characteristics/Indicators	*All Ethnic Groups*			*Indian Population*		
	1980	*1990*	*1995*	*1980*	*1990*	*1995*
Total Population ('000)	2413.9	3016.4	3467.5	154.6	229.5	**
Residents	2282.1	2705.1	2986.5	143.4	190.9	190.0
Non-Residents	131.8	311.3	481.0	11.2	38.6	**
Ethnic Composition (%)						
Residents	100.0	100.0	100.0	6.3	7.1	6.4
Non-residents	100.0	100.0	100.0	8.5	12.4	**
Total Population	100.0	100.0	100.0	6.4	7.6	**
Median Age (Years)* '	24.4	29.8	32.2	24.8	29.5	31.1
Persons in Ages 60+*	7.5	9.1	10.0	6.2	9.7	
Dependency Ratio (%)*						
Total	54	48	49	46	50	52
< 15 years	43	34	34	37	35	39
> 60 years	11	14	15	9	15	13
Children Ever Born *(X)*	3.4	2.9	**	3.4	2.7	**
Household Size *(X)*	4.9	4.2	4.0	4.3	4.2	4.0
Home Ownership (%)	58.8	87.5	90.2	42.2	80.9	85.0
HDB Households (%)	68.5	84.6	88.1	56.1	83.7	85.8
Private Houses (%)	8.5	7.0	6.1	10.6	7.4	6.3
Monthly Income from Work (S$)						
Mean Personal Income	598	1414	2377	568	1195	2188
Median Household Income	**	2296	3135	**	2174	3000

Sources: Censuses 1980, 1990 and 1995 GHS *Notes:* * For Residents only

** Not available or unpublished

colonial era, while the majority came from the working classes. Educated Indians and Sri Lankans came as teachers, clerks or government officers. These backgrounds are still dominant but social mobility would account for the apex in the pyramid, in contrast to Chinese. The fragmentary nature of Indian races is reflected by the multitude of sub-ethnic associations existent today while an Indian Studies department has been slow in formation at the universities (The National University of Singapore has set up a South Asian Studies programme, while a Tamil studies focus exists at the National Institute of Education). Increasing awareness of the need to interface with mainland Indian economic liberalization (despite the emphasis on South Asia) would have led to this recognition, whereas Chinese and Malay Studies departments had been established much earlier[2]. It is hoped that a full scale Indian Studies specialization would evolve from

[2]Separate departments and programmes exist at the two local universities for European, Malay, Chinese. English, Southeast Asian, American and Japanese studies to name a few.

TABLE 3: INDIAN POPULATION IN SINGAPORE, 1871-1997

Year	*Population (•000)*	*Proportion in Total Population*	*Growth Rate (%p.a.)*	*Sex Ratio (Males per 100 Females)*
1871	11.5	11.8		475
1881	12.1	8.8	0.5	404
1891	16.0	8.8	2.8	416
1901	17.7	7.8	1.0	421
1911	27.8	9.2	4.6	491
1921	32.3	7.7	1.5	498
1931	50.8	9.1	4.6	535
1947	69.0	7.4	1.9	299
1957	129.6	9.0	6.5	220
1966	135.8	7.0	0.5	164
1970	145.1	7.0	1.7	152
1980	154.6	6.4	0.6	132
1990	190.9	7.0	2.3	118
1995	190.0	6.4	-0.1	108
1997	230.6	7.4	10.2	113

Source: Computed from official data sources.
1980 onwards, resident population only.

TABLE 4: INDIAN RESIDENT POPULATION BY LANGUAGE GROUP, 1980 AND 1990

Language Group	*1980*		*1990*	
	No.	%	*No.*	%
Tamil	98,772	63.9	122,038	63.9
Malayalee	12,451	8.1	16,329	8.6
Sikh	na	-	12,771	6.7
Hindustani	na	-	3,848	2.0
Sindhi	na	-	2,842	1.5
Punjabi	12.025	7.8	2,307	1.2
Urdu	na	-	2,190	1.1
Gujarati	1,619	1.0	1,997	1.0
Sinhalese	na	-	1,994	1.0
Hindi	na	-	1,139	0.6
Others	26,765	19.2	23,452	12.4
Total	154,632	100.0	190,907	100.0

Sources: 1980-1990 Censuses *Notes:* na = not applicable
1980 census reports did not publish data on minor Indian language groups, who were included in "others". However, "Sikhs" would be included among "Punjabis".

complementarities between Singapore and South Asia. In fact, a Singapore-India Relations Study Group (formed in 1994) exists in the Centre for Advanced Studies at the National University of Singapore and will be the vehicle for the new South Asian Studies programme. It may be expected that these programmes will propel more focused research that would gather momentum with economic developments in South Asia, particularly in India.

It is a certainty that the ethnic share of Indians will be maintained at 7 to 8 per cent through ethnic immigration policy. This begs the question of a critical mass and quotas even in a meritocratic society. The lack of a critical mass in the distribution of student populations in tertiary institutions and in the skills-distribution may necessitate assignments of higher quotas and opportunities for the society's upliftment.

Current Population

In the last population census (1990), the distinction between the resident and nonresident populations became established, in that the statistical authorities published only the annual resident population estimates. Total population (ethnic or for all races) comprises the residents who are citizens and permanent residents, and non-residents who are aliens on work and employment passes.

Until recently, published annual estimates of 1981-95 for the population referred only to the resident population (Yearbook, annual issues). In fact, the current practice is to make available both the total and resident population estimates, but not in ethnic terms (Yearbook, 1997). Following this caveat, the ethnic estimates of population for Indians would necessarily refer to the censuses of 1980 and 1990. The inclusion of both the total and resident population estimates in the *Yearbook* is a welcome change, as proposed earlier (Shantakumar, 1996). Yet, if future estimates of total population were also made available by ethnic group, the picture would be complete and researchers would be able to conduct further analyses. This is wishful thinking for the moment, as official policy might dictate the non-disclosure of labour immigration statistics in ethnic terms.

Between 1980 and 1990, Indians as a group had increased by 74.9 thousand, compared to an increase of some 47.5 thousand residents, suggesting an influx of labour immigrants from South Asia. The indigenous growth capacity by the resident Indian population stood at 2.90 per cent per annum (1980-90), far below the growth for the total population at 4.03 per cent per annum. For comparison sake, growth in other ethnic populations is also presented (Table 5). The resident Indian population grew from 143.4 to 190.9 thousand during the 1980-90 decade, while the non-residents grew from 11.2 to 38.6 thousand, increasing their proportionate share in both categories: residents, 6.3 to 7.1 per cent; non-residents, 8.5 to 12.4 per cent. In reality, non-residents from the subcontinent have replaced the Malay non-resident workers to a large extent. The

proportionate resident Indian population was 7.4 per cent in 1995, a slight uptrend in the 1980-95 period, mainly arising from the influx of skilled workers and professionals obtaining permanent residence in Singapore. It is also clear that among the 1990 resident Indian population, persons aged 60+ made up 9.7 per cent in the total, which is highest among all ethnic groups. The older-dependency ratio (ODR) is also highest for Indians resident in Singapore. In 1997, older persons comprised 10.5 per cent, further attesting to the sex-ratio in favour of males at older ages,

The period 1980-95 witnessed unprecedented labour immigration (albeit temporary) from the Indian sub-continent into Singapore's construction and infrastructure sectors. In the latter period, Indian computer and engineering professionals were very much sought after, explaining the increases in the resident population since the fertility increase was minimal. During the 1995-2000 period, there is the possibility of a larger influx of these professionals into Singapore, thus fulfilling the implicit eugenic population policy. Other workers (the non-residents) will eventually return to their home countries after a contractual period, though many do return on extended work permits issued for two years at a time. Two types of choices are thus open to Indian sub-continent immigrant labour: permanent residence and citizenship for the skilled categories and temporary guest worker status for the unskilled. The freedom of choice in returning to the motherland is left to the individual, as repatriation of incomes is allowable under Singapore laws. This approach may be an optimal option, serving the ethos of the community of peoples from the sub-continent, despite sporadic illegal immigration.

That the non-resident Indian population had increased dramatically during 1980-90 can also be discerned through the growth rates recorded: 13.17 per cent in annual terms, just as the non-resident Chinese grew at 8.16 per cent per annum. Total population growth of Indians at 4.03 per cent per annum can thus be explained, whereas for the Chinese and Malays the corresponding rates were 1.95 and 1.50 per cent per annum (Table 5). However, since the resident population is of considerable importance in the perpetuation of a Singapore ethos for socio-economic development and economic growth, ethnic growth rates thereof are interesting. The period 1980-90 has witnessed a high degree of growth for the resident Indians (at 2.90 per cent per annum), higher than for Chinese (1.64 per cent). However, the 1990-95 period seems to have witnessed a decline in growth for the Indian residents (- 0.09 per cent per annum), in contrast to the Chinese (2.25 per cent) or Malays (1.65 per cent). In the next two years, Indian growth superseded the declines earlier: 10.17 per cent per annum, in contrast to 2.68 per cent for Malays and 0.93 per cent for the Chinese. These fluctuating rates of growth are symptomatic of "balancing" through the ethnic ratio policy, provided the 1995 estimates were accurate (based on the mid-term sample census of 1995). What is clear is that the ethnic policy is implemented seriously, fine-tuned to match the long-term ratio. In this process, it would seem that the Indian ratio would reach about 7 to 8 per cent eventually; if the Chinese ratio were to decline by a few percentage points, there is some

TABLE 5: GROWTH RATES IN ETHNIC POPULATIONS, 1980-97

Category/Period	*Indians (%p.a)*	*Malays (%p.a)*	*Chinese (%p.a)*
Total Population:			
1980-1990	4.03	1.50	1.95
Resident Population:			
1980-1990	2.90	1.53	1.64
1990-1995	-0.09	1.65	2.25
1995-1997	10.17	2.68	0.93
Non-Resident Population:			
1980-1990	13.17	1.05	8.16

Sources: Computed from Censuses 1980, 1990 and GHS 1995. See also previous table.

Notes: The resident ethnic populations ('000) for 1995 and 1997 are:

Year	*Indians*	*Malays*	*Chinese*
1995	190.0	415.3	2350.4
1997	230.6	437.9	2394.2

TABLE 6: THE ECONOMICALLY ACTIVE POPULATION, 1957-1995

Year	*Economically Active Indians ('000)*	*Labour Force*	*Participation Rate (%)*
		Indians	*All Races*
1957	63.0	69.3	49.9
1966	44.7	50.1	42.3
1970	59.0	53.6	46.6
1975	54.3	50.9	48.4
1980	78.8	59.6	55.9
1990	128.6	70.4	66.0
1995	117.6	90.8	64.4

Source: Compiled from various official publications

likelihood of increasing the Indian share to about 10 per cent, a development that is not likely unless the sources of Chinese influx diminish.

LABOUR RESOURCES, WORK AND INCOMES Labour Force Participation

Though force labour participation rates of Indians had always been significantly higher in the past, mainly from a high sex-ratio in favour of males and lower school enrolment (Shantakumar, 1993), the differentials between ethnic groups have narrowed.

TABLE 7: AGE-SEX-SPECIFIC ECONOMIC ACTIVITY. RATES FOR INDIANS, 1980, 1990 AND 1995 (IN PERCENTAGES)

Age-Group	*Males*			*Females*		
	1980	*1990*	*1995*	*1980*	*1990*	*1995*
15-19	49.4	33.8	22.7	45.2	34.9	18.0
20-24	93.2	85.4	79.1	70.0	78.8	66.0
25-29	95.6	93.5	93.9	54.9	73.5	65.1
30-34	97.2	94.4	96.4	45.1	66.7	56.6
35-39	87.8	95.1	97.0	38.6	64.4	57.3
40-44	97.8	95.1	97.5	33.2	57.8	47.8
45-49	97.2	94.0	94.9	24.2	43.8	47.1
50-54	95.1	90.5	91.4	19.9	32.5	30.1
55-59	83.6	79.7	85.1	13.1	21.9	22.3
60-64	67.1	68.8	57.0	8.2	9.8	10.7
S65	42.8	42.2	64.4	3.7	5.5	4.8
Total	75.3	81.3	81.8	38.2	56.7	46.6

Source: Computed from official publications. The economically active population includes the non-resident population.

TABLE 8: UNEMPLOYMENT RATES (%) BY SEX, 1957-1995

Year	*Total Population*			*Indians*		
	Persons	*Males*	*Females*	*Persons*	*Males*	*Female*
1957	5.2	4.9	6.2	4.4	3.9	9.8
1966	9.3	7.1	15.8	6.3	5.2	22.5
1970	10.4	7.7	18.1	9.3	6.5	32.3
1975	4.5	3.7	6.4	4.7	2.4	12.3
1980	3.4	3.2	3.8	3.3	2.7	4.9
1990	1.7	2.0	1.4	1.6	1.7	1.4
1995	2.7	2.7	2.8	2.9	2.6	3.6

Sources: Computed from official data sources.

Variations in past participation rates may be attributed to two factors: changing age-structure from demographic dynamics and socio-economic and cultural variables on work participation. The increasingly stabilizing sex-ratio would lead to rates of participation that may parallel national levels, while a high rate of female entry into the labour market is also important. Emigration and natural attrition of older males would diminish the abnormal sex-ratio, while higher economic participation of women arising from educational and employment opportunities would have been contributing to activity rate increases (Tables 6 and 7). Increased schooling ratio at younger ages, changing social norms, lower marital fertility and higher women's participation amidst the ever-increasing employment opportunities in the economy have all benefited the Indian population. In fact, Indian unemployment rates were below the national rates (Table 8).

The skill requirements of the techno-economy and globalization would necessitate. technical skills acquisition. The skills-mix among Indians would be a determinant of employment levels in the various economic sectors as well as differential occupational unemployment (Table 9). In earlier times, Indian preference for clerical and service occupations existed and this will now be replaced by acquiring generic skills, as would be the case for other ethnic groups as well. How rapid such an acquisition will be is a function of the transition to a new skills distribution.

Industrial and Occupational Composition

Until the 1980 census, detailed 5-digit occupational or industrial classifications were not published, but the latest 1990 census publication only provides one-digit classifications by ethnic group. Thus, any comparative analyses will_be restricted by this lack of detailed data. From a developmental perspective, has the structural shift in the economy benefited or affected the Indian labour force? An earlier comparative analysis for 1970 and 1980 provided some snapshots (Shantakumar, 1993). The 1980, 1990 and 1995 comparisons are necessarily limited to the one-digit classification (Table 10). In 1970, 33 per cent of Indians were in the "services" sector, while there were only 12 per cent in manufacturing and quarrying. A substantial number were also in commerce (trade). Comparative figures for the national population are 22 per cent (manufacturing), 27 per cent (services) and 23 per cent (commerce). It is clear that the Indian share (some 28 years ago) in the growth sectors such as manufacturing was below the national share, but the reverse was true in commerce. In the 1980s and beyond, Indian employment in manufacturing grew *in tandem* with national economic restructuring, but declined in commerce and services, despite the rise in Indian employment in the finance, insurance and business sectors as for the whole economy. In the 1990s, main sectors of employment for Indians have been the services, commerce, manufacturing and finance (totaling some 82.3 per cent in 1990, compared to the national level of 81.8 per cent). Thus, it is apparent that the 1970 and 1990 situations for these sectors of employment are identical, the differences being noticeable among the components, which would suggest a redistribution during the last two and a half decades. The trend is suggestive of successful Indian entry (in terms of employment) into the main economic sectors, but it is pertinent to study their occupational mix and income distribution (Table 11). In fact, by 1995, the four sectors employed 81.4 per cent of the Indian working population, a slight decline arising from the commerce and manufacturing sectors.

A large population of Indian workers was employed in production related occupations (32 per cent in 1970, 50 per cent in 1990, 34 per cent in 1995), only slightly lower than national levels. These jobs were in assembly lines, manufacturing and production crafts, with large intakes of females. Indian trends in occupational distribution parallel the national trends. Entry qualifications in such labour-intensive occupations were less

TABLE 9: UNEMPLOYED PERSONS (%) BY KIND OF JOB SOUGHT, 1974-1990

Occupation Group (Selected)	*All Races*				*Indians*			
	1974	*1978*	*1980*	*1990*	*1974*	*1978*	*1980*	*1990*
Professional, technical	7.7	7.4	8.2	15.7	9.4	10.2	7.4	12.5
Administrative, managerial	0.9	0.8	2.3	8.6	1.6	--	2.5	5.8
Clerical, related	27.5	24.4	21.0	13.1	35.9	35.0	28.7	11.7
Sales	7.3	9.6	8.8		3.1	2.0	6.6	
Services	8.3	8.7	8.3	13.8	12.5	13.6	10.7	14.8
Production, related	28.4	44.7	39.2	48.8	12.5	30.0	34.4	55.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from Labour Force Survey, annual issues.
Note: Columns may not add to 100, as residual occupation groups are not shown.

TABLE 10: DISTRIBUTION (%) OF WORKING PERSONS BY INDUSTRY, 1970-1995, SELECTED YEARS

Industry	*Indians*				*All Races*			
	1970	*1980*	*1990*	*1995*	*1970*	*1980*	*1990*	*1995*
Manufacturing	12.2	26.8	26.9	23.6	22.0	30.2	29.2	24.2
Utilities	4.0	2.6	1.1	0.8	1.2	0.8	0.4	0.3
Construction	5.9	3.7	7.2	4.6	6.6	6.7	7.9	6.7
Commerce	27.0	19.8	17.4	17.5	23.5	21.3	22.0	20.4
Transport, Communications	13.1	11.4	9.2	12.5	12.1	11.1	9.5	10.7
Finance, Insurance and Business	3.7	6.9	10.7	15.1	3.5	7.4	10.9	14.6
Services	33.5	28.3	27.3	25.2	27.2	20.8	19.7	22.1
Residual	0.6	0.5	0.2	0.7	3.9	1.7	0.4	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Computed from 1970-90 Censuses, 1995 GHS.

TABLE 11: OCCUPATIONAL DISTRIBUTION (%) OF WORKING PERSONS, 1970-95, SELECTED YEARS

Occupation	*Indians*				*All Races*			
	1970	*1980*	*1990*	*1995*	*1970*	*1980*	*1990*	*1995*
Professional, technical	7.8	8.9	12.5	23.6	8.6	8.8	15.7	23.1
Administrative, managerial	1.1	3.7	5.8	10.5	1.8	4.8	8.6	12.8
Clerical	13.3	13.9	11.7	13.9	12.9	15.6	13.1	12.9
Sales	21.5	12.4	14.8	14.1	16.2	12.4	13.8	12.3
Services	20.0	16.2			13.6	10.4		
Production related	31.6	36.0	50.4	34.0	39.2	40.4	44.5	34.6
Other	4.7	8.9	4.8	3.9	7.7	7.6	4.3	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from 1970-1990 Censuses, 1995 GHS

demanding, but current skill requirements will be higher. In 1970, Indian sales and services employment accounted for 41 per cent, now down to 14 per cent. Their share in higher skills (management, legal, professions and technical occupations) is now 19 per cent, slightly below the national levels, which would suggest an uptrend in educational attainment and skills acquisition for the community. Compared to the 1970s, there is considerable improvement in the employment-mix for Indians; the upgrading process seems to parallel the national levels.

Most Indians are in paid employment. As employers, they once dominated (between 1957 and 1970), but by 1980 have declined. Up to 1980, based on three-digit occupational data (Balagopal Nair, 1984), high-level occupations for Indians that were significant in the national share were: architects, engineers, doctors, dentists, accountants, jurists, teachers and government workers in administrative and executive positions. Such a situation may no longer prevail, judging from the one-digit occupational classification since 1990. Despite their proportionate increase in the administrative, professional, technical and managerial categories, national shares (especially for the Chinese) are certainly higher. Such a trend, we hypothesize, may be symptomatic for two reasons:

firstly, many Indians who were better-educated among the older generations could have migrated or retired or have experienced natural attrition; secondly, Indian replacement for these higher skills is not rapid or significant enough to compare with previous levels, while non-Indians could have increasingly filled up these positions on the basis of education, opportunities and competition. This conjecture may be based on the declining trends (at least up to 1990) in educational attainment and the paucity of non-academic skills among Singapore Indians, now increasingly offered to skilled Indians from abroad. Indeed, one is at askance at the level of higher educational attainment among the community! Even in the 1970-80 period, there were significant uptrends among the Indian population who became civil, mechanical and chemical engineers, town planners and architects, life scientists, doctors and dentists, school teachers and university academics (Shantakumar, 1993). It is highly probable that Indians from the earlier era sub-continent who would have been better qualified would have motivated their offspring to upgrade their professional skills. It is equally tenable (from anecdotal and census evidence) that many Indian children would have been attending foreign universities and would be less inclined to return to Singapore for a variety of reasons. It is encouraging to note (from 1990 census data) that 50 per cent of university-enrolled Singapore Indian students were actually overseas, a level that is proportionately highest among the various ethnic groups. And, it is even more poignant to note that Singapore Indians have less wealth when compared to Chinese Singaporeans, who may stand a better chance in the country in terms of majority share and the opportunities available in a meritocratic society. Also, while emigration would be expected to decimate Indian (higher) skills during the last three decades, replacement by local talent has also been less than expected. Researchers on the Indian population have, since 1982, called for increased

attention to counsel the Indian population and to improve their educational attainment (Shantakumar, 1983). On the other hand, presently immigrating Indians, as non-residents, would possess better skills and qualifications, accounting for the uptrends in higher occupational employment among the Indian population.

Over the period of the 1980s and early 1990s, Indians may be increasingly under-represented in the medical profession, accounting, teaching services, government administration, systems and managerial occupations. The late 1990s would be expected to witness an influx of Indian computer professionals, engineers, technicians, and finance managers, some or most of whom have been offered permanent residence status. The author is on record for pointing out the dearth of 'qualified' Indians in technological disciplines which required command of numeric and logical skills at tertiary levels. Since these were less forthcoming in the earlier period (prior to late 1980s), the globalization emphasis of the Singapore economy now attracts such qualified Indian professionals from *anywhere* in the world. This is an attractive proposition in skills complementarities, cost-effectiveness, productivity and further development to encourage skilled Indian immigration into the country (Shantakumar, 1995), despite the ethnic ratio policy practiced by the government. It is also to be observed that the local Indian community would need more motivation and opportunities to prepare for the technological economy. It is also imperative to ponder whether spurts of skilled Indian immigrants should fill up the demand when the local Indian population does not take up the challenges arising from minority status and the lack of "effective" encouragement. It is our opinion that the recent immigration policy to accommodate Indian skilled manpower is a strong motivation to improve skills and educational attainments among the rest of the Indian community in Singapore.

An estimate on the non-resident Indian population (persons of Indian origin, PIO) can be *attempted from fragmentary* official data sources. The number of non-resident PIOs in 1990 and 1995 by gender and age-group are estimated as follows:

Age-		*1990 Census*			*7995 GHS*	
Group	*Males*	*Females*	*Persons*	*Males*	*Females*	*Persons*
15-19	1388	853	2241	1795	524	2319
20-44	18368	12919	31287	21469	8344	29813
45-54	1060	751	1811	1994	1015	3009
$\geq$ 55	897	464	1361	531	652	1183
Total	21713	14987	36700	25789	10535	36324

Source: Author's indirect estimates from various official publications, wherever available.

From anecdotal and other media evidence, most female non-residents are from Sri Lanka, while most males are from India and Bangladesh. The bulk of the non-resident PIOs are workers on two-year employment permits. Those above 55 years of age are mainly dependents (parents, grandparents) accompanying professional employment pass

holders without Singapore permanent resident status. In the 1990-95 period, there is an increase in male worker immigration, while there is a decrease in females, the total number about balanced at 36 odd thousand. Most immigrant workers are from age 20-44.

From an income distribution perspective, we may expect inequalities between the ethnic groups, arising from differential skills composition, demand and educational attainment, despite the levels of increasing incomes for the country. In 1972-80, the median income (in nominal terms) for Indians doubled, paralleling national levels (Table 12). Incomes for the Indian working population has ranged from 81 to 102 to 97 per cent of the national level during 1970-95. Any decline in this comparative ratio would have begun in the post-1975 period, when national median incomes far superseded Indian incomes. In 1990, for instance, the Indian income of S$916 contrasted sharply with S$l,318 for the whole country (roughly 69 per cent). By 1995, this ratio had increased to 97 per cent, based on median incomes of S$ 1,582 for Indians and S$ 1,633 for the country.

Fluctuations in income are related to skill differentials and industrial growth and skill-specific labour demand. The parity of Indian incomes (wages and salaries) up to 1975-80 can be attributed to the narrow income differentials of the ethnic groups, when their skill levels were more uniformly distributed within the economy. Since the economic restructuring of the late 1970s and beyond the 1980s, the skills differentials between the ethnic groups must have significantly diverged, resulting in wide income inequalities of the 1990s. As incomes are skills-dependent, it is probable that the skills among the Indian workforce (and educational attainment) would have been less commensurate with technological demand for labour. Rapid acquisition of new skills of upgrading would have been necessary to capitalize on available opportunities, edging out those workers who had lagged in this process. Skill transformation has lagged among the local Indians, contributing to the income inequalities between the ethnic groups. The future decades would be technology-intensive, requiring generic skills that would determine income levels. Divergent ethnic income trends may be expected from market discrimination

TABLE 12: MEDIAN INCOMES (S$ PER MONTH) OF WORKING PERSONS, 1972-1995

Year	*Indians*			*All Races*			*Income*
	Persons	*Males*	*Females*	*Persons*	*Males*	*Females*	*Ratio**
1972	148	152	123	183	201	135	81
1975	264	291	205	258	315	199	102
1980	360	388	315	377	426	322	96
1990	916	1293	791	1318	1320	922	69
1995	1582	1775	1281	1633	1884	1320	97

Sources: Computed from labour force surveys, the censuses, and GHS 1995.

Note: * Median Income of Indians as a percentage of median income of All Races.

and competition, market friction (mismatch) and segmented labour markets. The Indian population would have to meet these challenges by •staying ahead in the skills pyramid and socio-educational mobility. It must be noted that ethnicity per se is not an indicator of income inequality, but a proxy variable that summarizes differentials in educational attainments, work skills, talents, supply and employer prejudices (labour market constraints). Divergencies in incomes will be the norm between and within ethnic groups, thus reflecting the talent heterogeneity inherent in the population. There is sufficient evidence for widening income differentials over time, for every ethnic group and between ethnic groups, particularly by education level, an expected phenomenon around the world. For Indians, their inability to compete effectively in the segmented labour market would be mainly explained by their lower skills attainment rather than ethnic discrimination in the first instance, although the latter cannot be completely discounted. Thus, prejudices may be overcome through the education and skills ladder, converting a double jeopardy into a single obstacle. The Indian population cannot ignore this daunting challenge.

EDUCATIONAL ATTAINMENT: A CHALLENGE

Education as a Desired Value

The motivation to undergo education has been strong and is still a desirable factor among the Indian diaspora, wherever they may be settled. Indeed, it is well documented elsewhere (Lee, 1998) that the mean household income of Indians in USA is the highest when compared to any race, colour or ethnic group in that country. Indians in UK are among the most successful industrialists and entrepreneurs, as attested to by their multinational enterprise in India or elsewhere. Wherever they had settled, Indians have acquired high levels of education and commensurate incomes, not to mention prestige (including Nobel Prizes). When Indians outside Southeast Asia are doing so well, why then are they lagging (within Southeast Asia) o»" seeming to lag in incomes or education? It is insufficient to prognosticate that the socio-economic backgrounds of earlier immigrant Indian communities would have been a retarding factor in their developmental ethos. That is, it is not sufficient to contend that the low economic status of early Indian immigrants would have given them a myopic approach to acquisition of education against incomes or savings. We advance the thesis that the level of return migration to the Indian sub-continent would have been substantial enough to contribute to their lack of incentive to provide social mobility to their children *outside* their homeland. The colonial administration in (then) Malaya and Singapore did encourage return migration to such an extent that workers (mainly in plantation and infrastructural occupations) had to leave behind their families in India. With savings, return migration assured them a status in their villages or states. The next generations would then be in the sub-continent itself, except for the few who settled permanently in their adopted lands. Even then, the

free-flow of peoples into or out of the sub-continent did not discourage maintaining contact with their ancestral homes (Sandhu 1993; Arasaratnam 1970). This fact can be discerned from the sex-ratio of older Indians in Singapore, favouring males. With the encouragement to settle permanently after the last war, the community has stabilized in terms of family formation and settlement. Thus, the Southeast Asian situation presents an altogether different paradigm in immigration, unlike in other countries where the Indian diaspora are comparatively well-settled and well-placed. As a comparison, Singapore Chinese (also immigrants) had the least incentive to return to China under a communist regime established in late 1940s. There was a greater incentive to stabilize family settlement and grow into a majority population in settled lands, with all the attendant advantages of citizenship, social status and motivation.

In the present context, if Indians continued to settle permanently in Singapore, it is certain that educational attainment as a *desired* value would be reinforced, much to the advantage of the community. Though currently immigrating Indians with skills are accorded permanent resident status, it is less certain that permanent settlement would be a norm. Two developments are possible: their progeny would be better educated and may work in Singapore, improving the skills matrix; alternatively, Singapore may be the springboard to emigrate to other countries (such as USA, UK, etc), not only for the immigrants out also for their children. Thus, it is all the more important for the local Indian population to target education as a desired goal of development, since they must co-exist as a minority within established ethnic ratios or among societies anywhere else in the world.

Attainments in Education Levels

The educational profiles of Indians (Tables 13 and 14) would reinforce the inequalities of income and of opportunities inherent in Singapore society. Literacy rates have always

TABLE 13: HIGHEST QUALIFICATION ATTAINED, 1980, 1990 AND 1995

Highest Qualification Attained	***Indians*** *(%)*			*All Races (%)*		
	1980	1990	1995	1980	1990	1995
No Formal Education and Incomplete Primary	29.9	27.7	16.9	35.6	31.4	22.9
Primary and Incomplete Secondary	46.8	34.8	28.8	43.9	29.6	26.0
Secondary	14.8	25.1	32.3	12.7	24.7	27.5
Upper Secondary	6.0	8.3	13.6	5.6	9.9	16.2
University	2.5	4.1	8.4	2.2	4.4	7.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: Excludes students currently enrolled. Upper secondary includes polytechnics.

TABLE 14: WORKING PERSONS (15+) BY HIGHEST QUALIFICATION ATTAINED BY SEX, 1990 AND 1995

Highest Qualification Attained	*Indians (%): 1990*			*All Races (%): 1990*		
	Persons	*Males*	*Females*	*Persons*	*Males*	*Females*
No Formal Education	6.6	5.9	7.8	8.6	8.4	8.8
Incomplete Primary	12.1	13.7	9.7	12.0	12.8	10.7
Completed Primary	15.0	17.1	11.9	17.9	19.5	15.0
Incomplete Secondary	19.7	21.5	17.0	21.2	22.9	18.1
Secondary	28.5	23.9	35.2	27.3	23.3	34.5
Upper Secondary	8.0	6.5	10.2	7.1	6.3	8.6
Polytechnic	4.1	5.0	2.8	1.5	2.0	0.5
University	6.0	6.4	5.4	4.4	4.8	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Highest Qualification Attained	*Indians (%):1995*			*All Races (%): 1995*		
	Persons	*Males*	*Females*	*Persons*	*Males*	*Females*
No Formal Education	4.1	3.2	6.0	3.9	2.8	5.8
Incomplete Primary	6.5	6.1	7.5	7.4	8.0	6.5
Completed Primary	13.2	12.5	14.9	13.3	14.4	11.6
Incomplete Secondary	12.4	13.3	10.5	11.5	12.4	10.0
Secondary	32.7	31.2	36.0	30.4	27.3	35.2
Upper Secondary	10.6	9.5	13.0	12.1	10.6	14.5
Polytechnic	5.2	6.0	3.3	8.0	8.7	6.8
University	15.3	18.2	8.8	13.4	15.8	9.6
Total	100.0	100.0	100.0	100.0	100.0	1000

Source: Computed from 1990 Census, 1995 GHS been high, 90 per cent in 1980 and 93 per cent in 1990, whether in their vernacular tongue or English. It should be noted that the national education policy is geared to attainment of proficiency in English (as a working language) and a second mother language (Mandarin, Tamil or Malay) while a third language (French, German, etc) may also be offered by the best students. Indian student enrolment in ages 6-16 is around 95 per cent (1990 Census), compared to the nation's 97 per cent. The period 1980-90 has seen increased enrolment and educational attainment at the secondary level and above:

university attainment from 2.5 to 4.1 per cent, upper secondary from 6.0 to 8.3 per cent and secondary attainment from 14.8 to 25.1 percent. Except for the last, the upper secondary to university attainments were lower than national levels. Compared to the nation, Indians with no formal education or incomplete primary education were lower in incidence, but higher for primary and incomplete secondary education. Obviously, the lack of sufficient secondary education may explain the *hiatus* in skills acquisition to enter the labour market with better expectations.

One may conclude that Indians who are highly literate and with higher than national school enrolment levels are satisfied with lower educational attainments, contributing to a high drop-out rate. There may be many mitigating circumstances to explain these

tendencies. For a long period of time, academic education has been valued in esteem and technical education was neglected. Streaming at primary six may result in incomplete secondary education while lower achievements at secondary four would lead to lower enrolment at pre-university and tertiary levels. The bulk would have primary and secondary education (60 per cent compared to 54 per cent for the nation, in 1990). There is room for improvement: despite being a minority, Indians are hard-pressed to increase their share of higher educational attainment, which ought to be above the national level so that there will be a critical mass for prosperity. Lower proportionate shares mean fewer absolute numbers necessitating an achievement target far above their 7 per cent ethnic share. Higher educational achievements among the community must be a priority.

The explanation of lower incomes is not only related to the educational attainment among the general Indian community, but more so of its working population, whose attainments seem to have improved (Table 14). Proportionately, Indians without formal education are fewer than at the national level: 6.6 per cent versus 8.6 per cent in 1990, but 4.1 per cent versus 3.9 per cent in 1995. Secondary level attainment among the working Indians is slightly better at 29 per cent versus 27 per cent (1990), and 33 per cent versus 30 per cent (1995). By 1990, attainments at upper secondary, polytechnic and university levels seem to have exceeded national levels; in 1995, the situation is reversed (31 per cent versus 34 per cent). In fact, the period 1980-95 has witnessed an *influx of* better-educated Indians who may be permanently domiciled in the country. Fluctuations in attainments at such levels among the working population may be explained by changing composition in the *influx* of skills by ethnic group. In other words, the local Indian population who had higher educational attainments could not have increased so rapidly, but only through foreign *influx.* When compared to the majority population, Indian attainments may seem wanting for the top-most education levels. Statistically, such differentials are minimal and concerted efforts at the community level would help push up the rates. Since pure educational attainment is not a consideration in Singapore, the emphasis is on excellence, which Indians may have to aspire for.

Official data on the ethnicity of university and other tertiary intakes are not published and inferences on the strength of the Indian tertiary enrolment must be anecdotal and indirect. In the 1980s, it was noticeable in the local universities that Indian enrolment was either low or diminished, contributing to the lack of a critical mass and unfulfilled admission quotas (in ethnic terms), if they ever existed. In some faculties, there is a dearth of Indian student enrolment, a reality gauged when moving through the academic halls or university convocations. It has been unofficially remarked that they did not meet the stringent admission criteria into demand faculties of learning (business administration, engineering or medicine). Traditional preferences for medicine, dentistry and law are less accessible to the community, on the basis of admission criteria, annual intakes and faculty quotas (if they ever existed). Admission criteria has certainly been raised to meet national and international standards, and marginal students (based on pre-U, A-level attainments) may not easily gain admission. Such policies apply to all ethnic groups but

minority groups (such as Indians) will have insufficient enrolment. This lack of critical mass calls for a higher quota for university admission of Indians, without being equated to national ethnic ratios.

In the 1970-75 period, attrition for Indian students were on the increase (Shantakumar, 199?): 8.5 to 15.7 per cent enrolled in Secondary I to IV, but still lower than national rates of 11.5 to 14.4 per cent. In contrast, their attrition between Secondary IV and pre • U was high at 82 to 78 per cent, when compared to the national rate of 79 per cent. In all likelihood, early streaming at Primary 3 or Primary 6 might have contributed to attrition. At the university level, Indian rates of attrition were comparable to national rates. More and more Indian students have now made it to Secondary IV and Pre-U 2, enabling them to seek admission into polytechnics and universities. Minimum pass grades may hinder them from getting into demand faculties of the two universities, though polytechnics are still open to the rest. Weaker grades at Secondary IV would tend to enter the Institutes of Technical Education, an interface between secondary and polytechnic education. It has been noted that an insufficient number of Indians may opt for technical education which is in effective demand. This might be explained by the lower preferences accorded by the community to technical education, despite the better returns in the labour market.

It is also well-known that the Indian share in academic and commerce streams had always been higher than the national levels, due to lacklustre interest for the technical stream. The opposite case is true for the Chinese and most Malays. In 1970, 96 per cent were in the academic stream compared to the national figure of 73 per cent[3]. At university, most Indians were in the arts and humanities, still higher than national levels.

In 1980, 36 per cent were enrolled in arts and social sciences, followed by medicine and dentistry (16 per cent), sciences (16 per cent), law (15 per cent), business administration and accountancy (13 per cent) and engineering (4 per cent). Comparative figures in 1970 were: 39,13,17,19,10 and 3 for the respective disciplines. The structural transformation can be discerned from the following:

Faddy/Discipline	*All Races (per cent)*		*Indians (per cent)*	
	1970	*1980*	*1970*	*1980*
Arts/Social Sciences	26	28	39	36
Science	38	21	17	16
Law 5	4	19	19	15
Business/Accountancy	10	14	10	13
Medicine/Dentistry	15	7	12	16
Architecture/Bldg.	0	4	-	-
Engineering	6	7	3	4
Total	100	100	100	100

Source: Compiled from graduation lists. National University of Singapore

[3]An attempt was earlier made to gauge the number of Indians in different academic and professional disciplines, as there was no official data. Graduation lists were used to count Indian graduates by discipline, discounting religious affiliation within the community

Structural shifts can only be explained through changes in admission criteria and ethnic quotas, so we conjecture. This 'redistribution' policy may have encouraged more Indians into other demand disciplines rather than traditional preferences. The best among the Indian university student cohorts would prefer law or medicine while many may settle for the arts, social and natural sciences, affecting the occupational-mix of the working population, as analysed earlier. Despite the notion that such a redistribution would improve their income distribution, it could also mean highly stringent entry criteria in traditionally-preferred demand disciplines of the community. If the said preferences continued, there is a high probability of Indian students seeking overseas professional programmes at any cost, if the retums are perceived to be worthwhile. The answer seems to be in the affirmative, using partial data from the 1990 Census: local and foreign university enrolments by ethnic group of Singaporeans provide some clues, viz.

Ethnic Group	*Persons ('000)*		*Per Cent*	
	Local Universities	*Foreign Universities*	*Local Universities*	*Foreign Universities*
Chinese	20.6	9.8	90.7	85.2
Malays Indians	0.8 1.1	0.3 1.1	3.5 4.8	2.6 9.6
Others	0.2	0.3	1.0	2.6
All Races	22.7	11.5	100.0	100.0
Indians	1.1	1.1	4.8	9.6
Rest	21.6	10.4	95.2	90.4

Source: Compiled from 1990 Census publications

The Indian share in local university enrolment, though better than for Malays, does not approximate ethnic share in the country, suggesting a shortfall by national quotas. However, their share in foreign universities is double (9.6 per cent). Despite their small numbers (2.2 thousand in total enrolment), there is a sizeable proportion (of 50 per cent) overseas, certainly not all on government scholarships, from available official evidence. There are many Indian parents, including middle-income families, who make sacrifices by sending their children to overseas universities, especially when their choices are not available in local institutions or when they fail to gain entry into the universities. Parents may also downgrade their properties or take up loans to educate their children overseas, particularly for law and medicine. Though these practices are universal among all ethnicities, the data suggest of possible imperfections which may exclusively encourage Indian students to pursue an overseas education. As scholarships are excellence-based, many would be precluded of the opportunity for overseas study. It is therefore a certainty that most Indian students overseas depend on their own or parents' resources. Another statistical artifact is also relevant: both local and foreign Indian enrolment aggregates to 6.4 per cent, almost *equivalent* to the ratio in the national total. It may be, perhaps,

a misnomer to suggest that Indians are unable to compete or that they are not capitalizing on available opportunities, if these figures are to be believed. It is all the more plausible to increase the Indian quota in local universities to match realities; otherwise, some (if not all) of the foreign-based Singaporean Indian students may be in effective demand in their countries of study, particularly when the local labour market may discriminate them in job search. Indeed, without prejudice, the Chinese share in local universities is too high (91 per cent) when their national share is only 77 per cent. Should there be a higher Indian quota to match the majority? This is a 'ponderable' for future national education policy!

The distribution of university graduates by major field of study in ethnic terms is available for 1990 (Table 15). Higher than national shares among the Indians are for graduates in the arts/social sciences, law, sciences and medical sciences. It seems that the community is well-represented in their traditional preferences but not in management, computer sciences, engineering or building sciences. Most of the Indian influx in late 1980s and early 1990s would be from graduates in computer, management and engineering sciences. Local Indian talent may yet be lacking in these areas.

For a minority Indian community with meager incomes, resources and wealth, educational investment is a serious proposition and testimony of motivation and commitment towards higher education. Wherever higher education is obtained by Indians, the end result benefits the country and the economy. In the event of non-recognition of foreign qualifications in the local labour market, since a segmented demand exists, some unintended results may be foreseen: (i) lack of official recognition or the existence of a "scheduled" list of foreign universities could lead to market imperfections translating into lesser opportunities for the overseas graduates (of any ethnic origin), some prejudicial to the minority community; (ii) the brighter ones may be motivated to emigrate so as

TABLE 15: DISTRIBUTION OF UNIVERSITY GRADUATES BY MAJOR FIELD OF STUDY, 1990 AND 1995

Field of Study	*1990*		*1995*	
	All Races	*Indians*	*All Races*	*Indians*
Arts/Social Sciences	25.0	35.5	22.6	31.3
Management/Accountaney/Commerce	24.4	13.3	25.6	17.1
Law	3.7	11.0	3.2	6.7
Statistics/Computer Studies	4.7	2.3	7.4	4.8
Natural/Physical Sciences	10.7	12.8	9.8	11.8
Medical/Dental	6.1	8.2	4.3	4.2
Engineering	20.2	13.6	22.5	22.4
Architecture/Buliding Science	3.6	1.1	3.8	1.0
Other	1.6	2.2	0.8	0.7
Total	100.0	100.0	100.0	100.0

Sources: 1990 Census, 1995 GHS

to find overseas opportunities depriving the supply of graduates locally, especially in the labour-scarce economy of Singapore. If elitism is the sole objective of education, a further skew may be present in the skills distribution, at least in ethnic terms. The silver lining would be when the overseas-trained Indian manpower is available in a discrimination-free local labour market. Even where emigration is feasible, Singapore Indians overseas may yet contribute to the GNP rather than the GDP, provided citizenship remains a status quo. All the more, there are sufficient opportunities to increase economic welfare through enlightened policies in education, at any level and Indians cannot languish in this respect. An interesting fact emerged from the analyses of census data on the ethnic aged (Shantakumar, 1994). We would "discover" that the presently *older* Indians had better educational attainments than other ethnic groups, suggesting that the under-attainment of education among present generations may be a myth or a statistical artifact arising from policy imperfections or circumstances, including out-migration. Both working and non-working aged Indians (60+) had better educational attainment compared to the rest of the population (Table 16). Most of the pre-1930 cohorts were immigrants from the sub-continent, some better-educated or motivated with aspirations for their progeny's betterment through socio-economic development. Immigrants into Singapore (an urban area with an international port) would include better-educated Indians but the income levels (even for the same education levels) were otherwise, symptomatic of segmented labour markets or market discrimination. Assuming uniform definition of educational attainment, there should be a positive correlation between education and

TABLE 16: DISTRIBUTION (%) OF AGED POPULATION BY ETHNIC GROUP AND EDUCATIONAL ACHIEVEMENT, 1990

Educational Attainement	*Chinbese*	*Malayas*	*Indians*
		Working Parsons Aged 60+	
No Formal Educaiton	73.7	76.0	62.0
Primary	17.6	21.3	23.8
Secondary	4.9	2.2	8.6
Upper Secondary'	2.1	0.4	2.6
University	1.7	0.1	2.4
Total	100.0	100.0	100.0
		Non-Working Persons Aged 60+	
No Formal Education	85.5	88.5	71.8
Primary	9.4	9.4	16.3
Secondary	3.3	1.5	7.6
Upper Secondary	1.3	0.5	2.8
University	0.5	0.1	1.5
Total	100.0	100.0	100.0

Sources: 1990 Census Monograph No. 1

Notes: 'Includes polytechnic education

incomes. For aged Indians, this is not so, when compared to the Chinese (see below).

Selected Age-Group (Average Incomes, SS)		*50-54*	*55-59*	*60-64*	*65-69*
Educational Attainment					
Primary:	Chinese	1427	1539	1721	1651
	Indians	1308	1247	1111	1116
Secondary :	Chinese	2448	2567	2961	3068
	Indians	2211	2119	1774	1647
U. Secondary:	Chinese	3670	3909	3884	3360
	Indians	3641	3144	2921	2442
University :	Chinese	6112	6960	8014	7349
	Indians	6369	6203	5152	4614

Source: G. Shantakumar, *The Aged Population of Singapore.* 1994.

The above data seems to suggest that market discrimination has always existed for Indian labour, resulting in segmented labour demand offering differential compensation packages in a predominantly Chinese majority country. Not that such practices are official policy, but the wealth is owned by the majority, enabling the existence of market segmentation or discrimination. Also, qualifications from the sub-continent were less-recognized or even discriminated in the market; whether such a situation will continue to exist is still moot. A uniform local education system should du away with market imperfections, but the import of foreign-qualified workers begs the status quo.

ISSUES OF DEVELOPMENT

The Need for Leadership

That the Singapore Constitution recognizes the special status and rights of the Indian minority is no longer debatable. The according of Tamil equal status as one of four official languages to be used in Parliament, to be taught in schools, or disseminated through the media, is a necessary condition for effective Indian leadership of the community. The 1980s witnessed a plethora of public fora (Shantakumar, 1983) that called for a concerted effort at Indian development in the face of lower educational attainment and wealth status, when compared to Chinese, while Malays were given early attention through the formation of MENDAKI, an organization now chaired by a Minister and solely concerned with uplifting the educational and wealth status of the second-largest community in the country. The feeling among the Indian elite (community leaders and academicians), including influential ministers, government servants and professionals, was that concerted efforts were essential to address issues of Singapore

Indian development. It was necessary to know why Indians were lagging behind in educational attainment, especially at the tertiary levels; the preponderance of arts and social sciences specialties had to be looked into, calling for a restructured plan; whether a counseling service was necessary to guide careers; if the society was hampered by low achievements in sciences, mathematics and related areas; whether social tension, family economics and sociology accounted for lack of motivation and under-achievement. It had also become clear that a separate Indian (or Tamil) Studies specialization was net going to be set up at the local universities, despite earlier assurances by the polity, and the community leaders (mainly Tamils) were calling for it. On the other hand, the multi-faced Indian community had no common agenda, as linguistic lines further sub-divided their interests, so much so that some Indian leaders (as well as some politicians) thought that Tamil chauvinism held sway. It was therefore timely to reconsider the options for the community[4]. Indian MPs in the Parliament set up an action committee to study and recommend a plan of action on similar footing as MENDAKI[5]. Thus, SINDA (Singapore Indian Development Association) was launched after the Report (ACIE, 1991) was released in 1991. It should be noted that some 10-12 years had lapsed between the call for such a body and its actual formation.

Indian Place in Singapore

The community's contribution to Singapore (and Malaysia) cannot be ignored. British colonial administration encouraged controlled immigration for construction of infrastructure and port-handling operations, certain professions (legal, accounting, teaching, clerical and medical) and commerce. In this context, businessmen from India were well-represented in Singapore commerce. Despite their contributions to national development, it is necessary to improve their condition by addressing impediments and removing the prejudices (if any).

Of course, Indians served a purpose, as others, and they migrated without their families in early times. Convict labour and the *'sepoys'* of the Bengal administration (Straits Settlements) carried out their appointed tasks to develop Singapore into a port (Sandhu, 1969). The presence of Hindu and Muslim heritage from India is a testimony. A number of mitigating factors might have retarded Indian developmental ethos in Singapore, from pre-war through independence. Some such issues are worth consideration, using historical and anecdotal sources.

[4]The author is on record for disseminating his views, assessments and suggestions in forming such a group, with financial backing from the community itself. The English and Tamil media was a vehicle to promote self-help for economic betterment through educational attainment. eventually, besides MENDAK.I (for Malays) and SINDA (for Indians), the Chinese would also form a body (CDAC), with official backing and considerable economic clout. Thus, each community will have a self-help group, once again perpetuating existing differential developmental ethos.

There were qualified Indian professionals in colonial Singapore. In all probability, they may have not been accorded parity status with British citizens or qualifications, thus facing market discrimination. The prospect of starting at a lower base and working gradually by annual increments by no means promotes high economic status, compared to colonial officials or businessmen. Such prejudicial treatment may be expected to continue, even after independence, when Indians did not aspire for local citizenship while preferring to return home with life-time savings or pensions. Thus, in a free labour market, prejudices and frictions would affect immigrant labour. The Indian government (colonial or otherwise) did not pursue the welfare of its citizens working overseas, as it now tries to accommodate overseas Indians through their investments and remittances (NRI and PIO Schemes). Under these extenuating circumstances, the Indian minorities (especially non-citizens) would be hard-pressed to earn more than the Chinese (mostly citizens), despite their having better educational attainment. Only in the last few decades have Chinese fared better in educational attainment, superseding the Indian experience.

The transient existence of Singapore Indians, as earlier pointed out, could be an inhibitive factor for their socio-economic development in that their investments in education and training may have been insufficient since their objective was emigration or return migration to their motherland. It is not contended that the entire Indian community aspired in this fashion, but a great many could have so practiced. The well-established fact in the local mindset has been the effective return-migration of Indians to their families in India. Even now, the high sex-ratio in favour of older males (citizens, permanent residents) attests to this phenomenon. Lack of permanent settlement is certainly a factor contributing to labour market imperfections, since the *dollar* quantum may translate into substantial *rupee* conversions at old age, enabling them to have a higher standard of life and land holdings in their motherland. In the postwar era, permanent settlement has been the norm, realized through the normalizing sex-ratio in ages below 50. Another historical fact is that in the early 1970s when British military bases were closed, many Indians took their pensions and savings and emigrated to India and elsewhere, as they were not Singapore citizens. Even in the early 1980s, there is evidence of qualified Indians emigrating to Australia, New Zealand and Canada: their English language proficiency, capability of adjustment within an English-speaking environment, confidence in competitive professionalism, aspiration for children's education, and certainly market imperfections, discrimination and lack of opportunities at home would have influenced their migration decisions. This vacuum is now being filled by qualified professionals from the sub-continent (mainly India), many taking permanent residence. It is now established that this is demand-driven in the globalization policy of the Singapore economy: computing, engineering, sciences and management studies. It is very early to predict whether earlier-observed return migration processes will repeat in the next two or more decades. The development of Singapore Indians must be gauged from these perspectives and how they are accommodated within a competitive environment.

Increasing employment opportunities have led to low unemployment in the nation, benefiting Indians as well. There is some perception that they are less able in capitalizing on the structural changes in the economy. Their shift to better-paying lead economic sectors or the top occupational ladder has been less significant. There is an undue concentration in specific sectors or occupations where upward mobility is less apparent or too competitive. This situation also affects the rest of the population but the lack of critical mass singles out the Indians to be marginalized by the labour market. Despite the equality of opportunity or pay, Indians may be *expected* to be twice or thrice better-endowed to face stiff competition.

Another emerging paradigm is the opening of the Indian economy itself. Since 1991, after India introduced gradual economic reforms, countries like Singapore were keen to invest in Indian industry, services and infrastructure. Many complementarities between these countries are seen (Shantakumar, 1995), but the human resource aspect is the most important. Manpower flows (from India to Southeast Asia) would encourage investments into India, as more and more Indians will interface with the operational or business parameters. Many ambitious investment portfolios by Singapore companies have been mooted but progress has been slow, due to political setbacks or bureaucratic processes. In recent years, qualified manpower resources such as computer specialists, scientists, engineers, managers, nurses, air hostesses and specialist teachers have been employed by Singapore organizations and these flows can intensify on the basis of investment commitments by Singapore. Of course, there is some reverse investment flows (from Indian investors) as well. When Singapore investments in India reach an optimum, there is maximum potential for Indians working in Singapore to provide the interface and contact points.

Developmental Ethos among Singapore Indians

It should not be construed that Singapore Indians have an apathetic attitude towards socio-economic development. Their minority status, sometimes exhibited through a minority-syndrome, may retard their enthusiasm. There may be a perception that Indians may not fare well in a competitive Chinese Singapore society, contributing to lack of effort or accepting the status quo that whatever the effort, the end-result is as expected. Taking the illustration from the Jewish diaspora, or even the Parsis of India, Singapore Indians should capitalize on their minority status by being more pro-active. An average Indian may have to be many times above the national average to earn the sympathy and respect of the leadership. Though there is enough anecdotal and hard evidence of Indians making it to the top of the skills-pyramid or economic-ladder, Indians in Singapore (and Malaysia) should not be seen as wanting. They should put developmental effort on a war-footing, even taking issues and speaking up for their contributions and rights. The only road to betterment is through education and commerce, even with partnership with the Indian mainland.

It becomes all the more necessary to provide incentives and encouragement to the community to reach national levels, and this would be an effective way in which Indians would contribute to the developmental ethos of the country. The transition from transience to permanent settlement will be expected to continue, contributing to stable sex-ratios and natural increase but there is least prospect of increasing their ethnic share, unless the government relaxes this policy. Better economic participation through effective incomes and remuneration would uplift their status, and the route is through higher education and technical training in modem skills. Parallel developments are in place among three segments of the community. One, a tiny portion are in elite professions, business and commerce and are mainly 'local' by residence and 'international' by professional experience. This influential group has contributed to schemes aimed at the community (Singapore Indian Chamber is a case in point), besides supporting SINDA, the developmental arm of the community. Second, the influx cf a professional cadre of Indian expertise who have been accorded residence or citizenship is also spearheading technological development, R&D and other industrial innovations. Their contribution must be highlighted so as to instill confidence among the rest of the community. Third, SINDA's efforts and the contribution of the Indian volunteer organizations (such as the Singapore Tamils Youth Club, Tamils' Representative Council etc) to uplift the community through education is aimed at the indigenous middle and lower income families. Of course, these groups may implicitly contribute towards labour market segmentation leading to heterogeneity, while the self-motivated may emigrate for better advantages. One would expect SINDA to unify these efforts for eventual community benefit.

Efforts at Development

The government has provided a quality economic environment to attract talents and skills from anywhere in the world, subject to ethnic quotas to preserve existing community 'balance': the necessary employment preconditions, the educational and training or skills upgrading in the best technical and vocational institutions, subsidized by the Skills Development Fund. Indians, like the rest of the population, are also expected to seek and exploit these opportunities to enhance their jobs and incomes. SINDA has been getting into this act in recent times but mainly to recruit younger students to take up technical and vocational training. Some approaches to inculcate better aptitudes (and attitudes) are in place: community tuition projects, counseling and advisory services are a case in point.

The Tamils Representative Council (TRC) Education Assistance Programme (started in 1982), has spearheaded tuition programmes through volunteer teachers, covering key subjects at primary, secondary and pre-university levels. Public financial assistance was less forthcoming and funds were raised by the TRC volunteer youth through various projects. A career guidance programme was mooted (Shantakumar, 1984), with the

Tamil Language and Cultural Society (TLCS) launching the Education Information Services in 1986, covering law, commerce, engineering, arts and social sciences, computer and physical sciences. These efforts needed considerable resources pooling but the momentum was less visible. In recent years, the Singapore Tamil Youths Club (STYC) has taken up this challenge.

SINDA's mission objective is to close the performance gap by the year 2010, with intermediate targets to be achieved. It has two aims, education and welfare. In the few years of its existence, SINDA has set up family and student courseling services while tuition centres provided training in study skills. Parents are also invited for the counseling sessions alongside their children, and part-time tuition classes are offered in key subjects for key school levels. It is articulated that SINDA could have had some impact on the community, but its reach has to be widespread to tap all sections to improve the critical mass. With all the efforts, besides SINDA and voluntary bodies, Indian students have also made some headway in achievement standards. The effectiveness of SINDA will improve if a wider catchment is practiced, instead of the top-end of the talent pool. On the sideline, SINDA must promote skills training programmes for Indian workers as well, whish would also help their children. In recent years, SINDA's promotion of technical education among the Indian community is a welcome effort in this direction.

In a 1995 assessment, SINDA has reported that the targets set in 1991 had bsen well exceeded, with Indian student scores superseding original targets, viz.,

Criteria]	*1996 ACIE target (percent)*	*Indian Performance (Pass Rates)*		*Relative Performance National-Indian Cap*	
		1991	*1995*	*1991*	*1995*
PSLE					
Maths	67	55.9	71.1	22.1	154
Science	82.6	85.5	8.8	7.0	
Secondary I Eligibility: Special/Express					
Stream (Chinese+Grades)	57	45.4	55.4	14.6	3.6
Secondary 5 Eligibility:					
Normal Stream	75.9	71.2	4.9	8.3	
0 Level Maths	71	63.7	74.7	21.0	13.5
5 0 Level Passes	62	54.9	61.1	14.8	12.0
Junior College Eligibility	31	25.3	31.3	12.2	11.4

Source: As reported in *Straits Times,* July 7, 1996

These figures, no doubt, underlie the renewed "consciousness" of the Indian minority in uplifting its educational status; the very formation of SINDA could have emphasized the eamestness of government and Indian elite about Indian developments. National averages have also improved significantly and Indian must be a constituent of this

upsurge. Compared to national averages, the Indian figures are still wanting in terms of Secondary 5 and above levels (last two columns in table above), as the "gaps" are larger or about equal. To quote Minister of Law. Professor S. Jayakumar, Chairman of SINDA Board of Trustees: "We have mad& good progress but I want to caution that we cannot be self-satisfied and euphoric. The ACIE's targets are absolute targets for the Indian community alone. SINDA's mission is to reach parity with the national average by the year 2010. So we need to take into account the gap between the Indian community and the national average." It has been observed that students from other ethnic communities had also improved their results *tremendously*, pushing the national educational performance even higher. The implications is that the Indian community has to work even harder and make education the central theme of economic and family life. Since the national averages have also escalated, Indians must also strive to reach even better standards in educational achievement.

The Singapore government will contribute S$0.5 million to the S$l million annual grant to SINDA, while Indians earning more than $S600 per month are encouraged to increase their monthly CPF contribution to SINDA by $81. So, Indians are actually helping themselves to improve. It is fitting to conclude by what has been observed by an Indian Member of Parliament: even if Indians could not afford or achieve a University degree, a polytechnic education or technical education could be the minimum needed by workers to register some progress in economic and social development. Even more illuminating were the figures provided, viz.,

University (Local)			*Polytechnic (Local)*		
Year	*Indian University Students*	*Per cent in National Cohort*	*Year*	*Indian Polytechnic Students*	*Per cent in National Cohort*
1981	436	4.1	1986	230 1.0	
1988	1360	6.6	1990	406 1.3	
1994	1229	3.3	1994	1100 2.6	

Source: Tamil Murasu, 8 July 1996.

Proportionate Indian shares in local universities and polytechnics do not come anywhere close to their ethnic share in the country. That is, the decline to 3.3 per cent in the local universities from 1988 is way below the 7 per cent ethnic share in the nation. The polytechnic participation share has improved but has yet to reach national levels. Once again, these statistics highlight a poignant fact that the decline of Indian students, at least in the two local universities, must be compared against the prospect of an increasing number of Indian students in overseas universities, as discussed earlier. Obviously, more enlightened policies seem wanting in the context of Indian socio-economic development. Perhaps this can be achieved through better ethnic quotas into universities, even higher than their national shares.

Even for those who do not make it to the university level, local or abroad, polytechnic education is perceived to be less attractive. With the manufacturing sector contributing 30 per cent to the GDP, there is an effective demand for technical personnel who will be trained in the polytechnics and technical institutes, where Indian students are under-represented. At least 10 per cent Indian representation is required in the polytechnics to make significant inroads towards a development ethos, underlying the case for a critical mass.

Conclusions

Years of pessimism among the Indian community in Singapore could have been a function of aspersions on economic development and ethos in the Indian sub-continent. A sense of pathos among Singapore Indians in the past has also contributed to this view. We are confident now that the wheels of modem progress have been set in motion and there cannot be an about-turn. As the Singapore polity is more than serious about ethnic welfare among its racial distributions, continued progress is assured for the community. Indeed, the formation of the CDAC for the Chinese should be a signal for the other ethnic self-help groups (SINDA, MENDAKI) that the individual communities must strive for themselves for national welfare. In other words, the CDAC will operate under better auspices in terms of resources, incentives and policies, even further surpassing the rest of the population. Target and mission goals would require continuous monitoring and revision. We may thus expect competitive developments towards betterment, an opportunity that cannot be ignored by Singapore Indians.

It would be interesting to analyse the background of the university-qualified Indians in Singapore and the country where their highest degrees were obtained. Despite the fact that the 1990 Census and the 1995 GHS (a mid-term sample household census) enumerated ethnic groups, the educational attainment statistics hitherto published *do not* provide detailed ethnic distributions of university attainment by country of origin, although aggregate data are available for the national level. We may use "indirect" inferences to construct the "distributions" of Indian-qualified graduates (irrespective of ethnic origins) to derive and estimate of the contribution of India to university education of persons (mostly of Indian origin now residing in Singapore). In all certainty, nearly all Indian-qualified graduates would be of Indian origin (from India or Singapore), now classified as the resident population, therefore excluding non-resident Indian graduates working in Singapore[6] (Tables 17 and 18). In 1990, 1545 persons had Indian degrees, increasing to 4704 in 1995, mainly from computer systems and engineering studies. Declines in all other disciplines can be discerned. For each major specialization, the 1990-95 period has witnessed proportionate increases: computer systems (0.4 to 2.1 per cent), sciences

[6]This estimation exercise is an illustration of the extraordinary research efforts that must be expended to derive figures where they are not officially published despite their availability in government data banks.

TABLE 17: DISTRIBUTION OF HIGHEST UNIVERSITY QUALIFICATIONS OBTAINED IN INDIA AND WORLD, 1990 AND 1995

Major Field of Study	*1990 (%)*		*1995(%)*	
	Indian Qualified[1]	*All Countries*[2]	*Indian Qualified*[1]	*All Countries*[2]
Arts, Humanities, Social Sciences	40.5	25.0	31.5	22.6
Administration, Management, Commerce	14.0	24.4	13.1	25.6
Law	1.2	3.7	0.9	3.2
Computer Systems	I.2	4.7	5.2	7.4
Natural, Physical, Mathematical Sciences	21.2	10.7	19.5	9.8
Medical, Dental	5.2	6.1	2.2	4.3
Engineering	11.5	20.2	26.4	22.5
Architecture, Valuation	0.8	3.6	0.6	3.8
Others	4.4	1.6	0.6	0.8
Total (%)	100.0	100.0	100.0	100.0
Number	1,545	84,919	4,704	155,821

Source: Compiled and computed from 1990 Census, 1995 GHS Reports Data for exclusively Indians not published officially.

Notes: 1. Any person (irrespective of Indian origin) qualifying in Indian universities included here.

2. Qualified in all countries, including India, for the entire country.

TABLE 18: PERSONS QUALIFYING IN INDIAN UNIVERSITIES BY MAJOR FIELD OF STUDY, 1990 AND 1995

Major Field of Study	*Indian Qualified*[1]		*All Countries*[2]		*Per Cent*[3]	
	1990	*1995*	*1990*	*1995*	*1990*	*1995*
Arts, Humanities, Social Sciences	625	1,477	21,188	35,266	2.9	4.2
Administration, Management, Commerce	217	617	20,752	39,885	1.0	1.5
Law	18	44	3,162	4,992	0.6	0.9
ComputerSystems	18	245	4,010	11,453	0.4	2.1
Natural, Physical, Mathematical Sciences	327	916	9,068	15,328	3.6	6.0
Medical, Dental ..	81	102	5,178	6,773	1.6	1.5
Engineering	178	1,243	17,193	35,086	1.0	3.5
Architecture, Valuation	12	30	3,052	5,886	0.4	0.5
Others	69	30	1,316	1,153	5.2	2.6
Total	1,545	4,704	84,919	155,821	1.8	3.0

Source: 1990 Census, 1995 GHS. *Notes:* I. Persons of any ethnic origin qualifying in Indian universities.

2. Persons qualifying in all countries, including India for the entire country.

3. Indian Qualified (1) as percentage of Global Qualified (2).

(3.6 to 6.0 per cent), engineering (1.0 to 3.5 per cent) and the arts, humanities, social sciences (2.9 to 4.2 per cent). It is clear that India has the best potential to provide cost-effective overseas education for Southeast Asia, and certainly for the Indian diaspora.

Of course, it is also apparent that Indian-qualified graduates in demand disciplines have also been meeting effective demand in the Singapore economy, reinforcing the complementarities paradigm between the regions. Overall, the Indian-qualified, whatever their citizenship, increased their share from 28 to 43 per cent during 1990-95.

There needs to be some activation towards the recognition of Indian tertiary qualifications through an accreditation process. Only a few elite Indian institutions have been officially recognized: here, both governments (India and Singapore) have to cooperate in recognizing standards in the education streams. Twining programmes may be considered. With accreditation, more complementarities in manpower flows will result. The recent setting-up of a South Asian Studies programme at the National University of Singapore is in the right direction, which recognizes the importance of the sub-continent in economic development and globalization. We would expect some multiplier effects from this recognition.

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