

INCOME DISTRIBUTION IN SINGAPORE*

**Chia Siow Yue
and Chen Yen Yu**

INTRODUCTION

The East Asian financial crisis that erupted in mid-1997 has put an end to the East Asian Economic Miracle. Policymakers and analysts are increasingly questioning the past emphasis on GDP growth and the inadequate attention paid to the quality of growth, defined in terms of its economic vulnerability to external shocks, and the impacts on the environment, poverty reduction, and income inequality. At the same time, there is recognition that globalisation is here to stay, and that countries have to learn to manage globalisation so as to maximise on its benefits and minimise on its downside risks. In the race to be globally competitive, how much attention should policy making give to pro-poor growth and to reducing income inequalities?

This is a country study on the Singapore experience with growth and income inequality. It reviews the various sources of data and various studies on income inequality. It then attempts to decompose inequality according to education, economic activity and occupation. Finally it examines the various policy measures that impact directly or indirectly on income inequality in the city state.

FEATURES OF THE SINGAPORE ECONOMY

Economic Growth and Structure

In Singapore, GNP per capita reached S\$37,433 (US\$20892) in 2001, the result of decades of high and sustained growth.

Singapore is an island state with a land area of only 650 sq km and without any valuable mineral or agricultural resources. Its only natural endowment is its strategic geographic position at the southern end of the Straits of Malacca, the waterway that links East Asia with South Asia and Europe. Through economic and trade strategies, Singapore is able to exploit its geographic location to become historically a major entrepot, and in recent decades a major trading, financial and transportation hub and an export manufacturing platform. Singapore's total population is only 4 million, including 0.8 million foreigners. Singapore's human resources is the key to its economic growth performance, and this human resource has been nurtured through education and training and expanded through selective immigration.

Economic growth is very much externally driven. External trade triples GDP in size. External demand constituted around 79% of total demand in Singapore in 2000. In addition, the share of resident foreigners and companies in GDP increased from 9.3% in 1995 to 34.8% in 2000.¹

The remarkable economic progress in the decades since the early 1960s is shown in

* Draft January 2003

¹ Singapore Yearbook of Statistics, various issues

Table 1. GDP growth averaged 8.7% annually, with 12.9% in 1965-70, 9.0% in the 1970s, 7.3% in the 1980s and 7.8% in the 1990s. The Asian Financial Crisis erupted in July 1997 but its contagion effect was not felt in Singapore immediately, with 1997 achieving a growth rate of 8.5%. The Crisis impact was evident in 1998 when the economy suffered a slight negative growth (-0.1%). There was a sharp rebound to 6.9% in 1999 and 10.3% in 2000. The recovery proved short-lived as the economy shrank by 2% in 2001 due to weak external and domestic demand and the worst economic contraction since the mid-1960s. Recovery in 2002 was weak as the economy grew by a modest 2.2%.

The city state has a highly atypical manufacturing-services economic structure with no primary sector (**Table 2**). Policies focusing on developing the manufacturing and services sectors as the twin engines of growth have driven various structural changes in the Singapore economy since the 1960s. The share of manufacturing in GDP (1990 prices) increased from 15.9% in 1960 to 28.2% in 1980. There has been some degree of "de-industrialisation" since the late 1980s, so that the share of manufacturing in GDP declined to 26.4% by 2000. While the overall contribution of the services sectors to GDP has remained relatively stable through the decades, the contributions of different service subsectors have undergone dramatic change. The growth services are financial services, whose share of GDP rose from 2.6% in 1960 to more than 10% in the 1990s; and transport and communications services, whose share of GDP rose from 8.4% in 1960 to 14.0% in 2000. In contrast, the share of "other services", which include many low-value added services declined from 20.0% to 10.7%.

Labour Force and Employment

Changes in economic structure in Singapore have resulted in significant shifts to the labour market in Singapore.

The total labour force stood at 2.2 million in 2000. Singapore moved rapidly from a labour-surplus to a labour-deficit economy due to the high GDP growth rate and the pattern of industrialisation which emphasised labour intensive industries in the 1960s and 1970s. The unemployment rate declined rapidly, from a high of over 10% in the early 1960s to 4.5% by the mid-1970s and continued to trend downwards. Singapore became increasingly dependent on foreign workers by the late 1970s. The outbreak of the Asian Financial Crisis and the ensuing economic downturn as well as economic restructuring have led to the unemployment rate rising from 1.8% in 1997 to over 3% in subsequent years.

The Singapore workforce shows the following characteristics.

- *Dominance of employees:* Employment is primarily in the urban formal sector. Employees account for over 80% of the workforce. Hence most of the workforce would be covered by the Central Provident Fund (CPF) scheme with compulsory contributions by both employers and employees.

- *Rising female participation:* Female labour force participation rate has risen from around 30% in the 1970s to well over 50% in the 1990s.² Females accounted for nearly half of Singapore's workforce. The growth of double-income households have

² Singapore Yearbook of Statistics, various issues

contributed to improved household living standards as well as impacted on income distribution.

- *Rising foreign worker component*: Rapid economic growth as well as the impact of declining fertility rates on the natural increase in the labour force led to growing labour shortages after the mid-1970s. Shortages appeared at both ends of the skills spectrum. At one end are shortages of unskilled and semi-skilled workers for labour intensive manufacturing, construction activities, and low-end service occupations such as cleaners and household maids; at the other end are shortages of top-level managers and professionals. The presence of foreign workers impact on the wage level and wage structure, and thus Singapore's income distribution.

- *Rising educational profile*: With the emphasis on education and training since the 1970s, the educational profile of the population and workforce has improved. In 1979, only 11.5% of the workforce had post secondary qualifications. By 2001, this had risen to 38.1%.

- *Changing sectoral structure of employment*: **Table 3** shows the sectoral distribution of employment for 1979 and 2001 from the labour force surveys. The most dramatic change is the manufacturing share of employment, which declined from 28.8% in 1979 to 18.8% in 2001; the declining share of total employment has been more drastic than the declining share of GDP, reflecting a structural shift within manufacturing from labour intensive industries to more capital intensive industries. The growing employment share of the financial and real estate sector reflects this sector's rapid growth in the past two decades. Notably, the employment share of community, social and personal services has increased between 1979 and 2001 to 24.7%, even though the sector's share in GDP has declined. This reflects the labour and skills intensive nature of many services, including that of education and healthcare. The significance of the structural changes on income levels and equity is evident in **Table 4** which shows the average monthly income of labour in the different economic sectors for 2001 as compared with 1978. In both time periods, the finance and real estate sector has the highest average earnings, while the community and personal services sector has the lowest average earnings in 2001.

- *Changing occupational structure*: As **Table 5** shows, the development of skills- and technology-intensive industries have increased the proportion of professionals, technicians and managers from a mere 11.4% of total employed in 1979 to around 42% in 2001. Conversely, clerical, services and sales workers, production and plant workers and labourers that were the main occupations pre-1980, constituted about half of total employed in Singapore in 2001.³ As **Table 6** shows, the occupational categories of administrators, managers and professionals are at the top-end of the earnings spectrum, while service workers (excluding the professionals) are at the low-end of the earnings spectrum. The table also shows that the ratio of earnings of the top-end occupations to the low-end occupations has widened in the past two decades, indicating a growing skills premium.

The impact of public policy in income creation and income distribution in Singapore will be discussed in a later section. The following section examines definitional and methodological issues in measuring income inequality, followed by a section examining trends in income distribution and its decomposition in Singapore.

³ Singapore Labour Force Survey, 1979 and 2001. Data refers to employed persons aged 15 years and over.

INCOME INEQUALITY - DATA, DEFINITIONS AND MEASUREMENTS

Income Data for Singapore

The main sources of income data of Singapore households and individual income earners are the household expenditure surveys (HES), the labour force surveys (LFS), and the population censuses. Other sources of data on income and earnings are --- censuses of industrial production on worker remuneration in the manufacturing sector; Central Provident Fund earnings data of members; and Inland Revenue earnings data on taxpayers.

Household expenditure surveys (HES)

The Household Expenditure Survey is undertaken every five years since 1972/73, to collect data for compiling the Consumer Price Index. Income data from HES refers to the sum of income of every household member, defined to exclude domestic servants and boarders. Household income includes money income received on a more or less regular basis – wages before deductions for provident fund contributions, union dues or loan repayments, profit before taxes, investment income and transfer payments (such as pensions and social welfare grants). Receipts from the property sales, loans, tax refunds, gratuity and lump sum provident funds and insurance payments are excluded.

Labour force surveys (LFS)

The Labour Force Survey is undertaken annually since the late 1970s, except for years 1990, 1995 and 2000 where the necessary information on the labour force was obtained from the 1990 Population Census, 1995 General Household Survey and the 2000 Population Census. Income data from LFS refers to the total sum of employment income. For employees, income includes wages, allowances, overtime, commission, tips and bonuses, employee's CPF contribution. For employers and own account workers, income refers to total receipt from sales and services performed less the business expenses incurred.

Population censuses

Household income data was collected for the first time in the 1990 population census, based on a sample of the population. Household income refers to the sum of income received by all members of the household (excluding domestic maids) from employment and business. For employees, gross monthly income refers to total gross monthly wages or salaries including commissions, overtime pay, National Wages Council supplements, tips, other allowances and one-twelfth of the annual bonus received or expected to receive. Payments in kind, reimbursement for transport and other expenses are not included. For the self-employed, gross monthly income refers to the average monthly profits (total receipts less business expenses incurred) from business, trade or profession.

There are differences in survey coverage among the three sources of income data. For instance, property income is not included in the labour force surveys and population censuses. On the other hand, the household expenditure surveys exclude single-person households.

Another complication for empirical analysis is that the published income data have different income intervals groups, making it difficult to compare income data from different sources. For a given income interval, the midpoint or mean income is used for computational purposes. However, open-ended classes at the bottom and top of the income distribution data complicates computation of the Gini coefficient, which is highly sensitive to extreme values. One approach is to fit a Pareto curve for the last two income classes. Another approach is to estimate the upper limit of the income distribution from the assessed income data as contained in the annual report of the Singapore Inland Revenue Department.

In addition to constraints in income data availability, the analysis of income inequality can be affected by the time frame of the data. The income distribution of a particular year can be affected by a economic shock such as sharp changes in prices or sharp changes in employment and earnings, or sharp policy shifts.

Poverty versus Income Inequality

Absolute poverty is commonly measured by the number of persons or households that fall below a defined international or national poverty line. For international comparisons, the World Bank has adopted the poverty line of US\$1 per person per day. The difficulty in inter-country comparisons based on a common poverty line is the wide differences in purchasing power across countries. Obviously one US dollar will buy different amount of goods in high income countries like the US and Singapore as compared to low income countries like Cambodia and Laos.

Countries usually have their own national poverty lines, based on the monetary value of a minimum basket of goods as determined from household expenditure surveys. In low-income countries the poverty line represents a survival basket, below which households and individuals live in destitution. But in more affluent societies, the survival basket becomes a socially or customarily accepted "necessary" basket. For example, while ownership of a TV set is not included in the survival basket in Cambodia and Laos, it is included in the necessary basket in the US and Singapore. Thus, as a country moves up the development ladder, the poverty line moves upward. The composition of the necessary basket is also determined by the impact of culture and religion on consumption patterns.

Unlike absolute poverty, income inequality is a relative measure and will always exist, irrespective of a country's level of development. Unless everyone in society receives the same income, there will always be the relatively rich and the relatively poor. The linkage between poverty reduction and income inequality has not been empirically tested in Singapore. While poverty incidence has shown a continuing decline with rapid and sustained economic growth, income inequality has shown a mixed trend, first falling and then rising.

Different Measures of Income Inequality

Household versus individual income

Some income data use the household as the unit of measurement, while other sources of data measure the incomes of individual income earners or workers. Measures of

inequality based on the household has to take into consideration that households vary in size, both with respect to income level and over time. Average household size in Singapore has shrunk over the decades reflecting the demographic phenomenon of declining fertility and number of children per household as well as the social phenomenon of the rise of single-person and nuclear-family households. What has also become evident is the growth of double-income households in Singapore as a growing number and proportion of married women join the workforce. Empirical data shows that there is no significant difference in household size by income groups and declining fertility affects all income levels. However, household size varies with ethnicity. Malay households tend to have more children than Chinese households.

To correct for the bias created in both cross-section and time series data by differential household size, household income has been deflated by number of persons in the household to derive average household income per capita.

Expenditure versus income

Data on household expenditures and household income are available from the household expenditure surveys. Distributions based on expenditures are less skewed than distributions based on income. At the low-end, household expenditures could exceed household income because of dissavings and transfers to maintain a certain minimum consumption standard. At the high-end, household expenditures fall far below household income; after adjusting for household size, household savings rates tend to rise with income levels. Household expenditure data is crucial for measurement of poverty incidence and changes in standard of living and less so for measuring income inequality.

Real versus nominal income

Income data from the household expenditure surveys, labour force surveys and population censuses are all in current prices. Existing empirical studies on changes in income distribution are based on nominal incomes rather than incomes deflated by either an overall Consumer Price Index or consumer price indices for different levels of household expenditure. **Figure 1** from the *1996 Report of the Cost Review Committee* shows the trends in CPI for three expenditure categories for the 1985-92 period. The inflation rate for the lower income group is lower than that of the higher income group, indicating that income distributions based on real rather than nominal incomes should show a lower income inequality.

Taxes and subsidies

Taxes and subsidies affect the disposable income of households and individuals and generally serve to narrow income inequality. A progressive personal income tax system will tax the rich more heavily than the poor and hence reduce post-tax income inequality. Consumption taxes, such as the goods and services tax (GST) are generally regressive, impacting the poor more heavily than the rich because they spend a higher proportion of their income on consumption needs. The Singapore government is averse to the creation of a welfare state such as exist in western countries, being concerned not only with the fiscal burden but also with creating a culture of entitlement and disincentive to work and save. Hence

state subsidies are restricted largely to housing, education and health care. Government provision of social assistance in cash or kind to the poor are very limited, and dependence on community and family help is actively encouraged.

Gini coefficient

The Gini coefficient is a commonly used measure of income inequality. A coefficient of zero denotes perfect equality, that is, all households or individuals have the same income level. A coefficient of one denote perfect inequality, with only one household or individual accounting for the total income of society. The Lorenz curve is a graphical plot of the cumulative shares of households in ascending order of income and the cumulative shares of the income of households. The curve becomes a straight line (the egalitarian line) when there is equal distribution of income among households/persons. The extent to which the Lorenz curve deviates from the egalitarian line indicates the level of income inequality. Two formulae for calculating the Gini coefficient will be included in this section.

The Gini coefficient can be computed as the summation of the areas of trapezoids to determine the area under the egalitarian line and above the Lorenz curve. However, as highlighted by **Rao and Ramakrishnan (1980)**, the trapezoids areas overestimate the area under the Lorenz curve and result in the underestimation of the Gini coefficient. Another source of limitation on the accuracy of the Gini ratio is the need to assume the means for each of the income groups. The assumptions used in determining the means for each income group will have an impact on the calculation of the ratios. The formulae for the computation of the Gini coefficient is given in **Table 7**.

One main advantage of the Gini coefficient is that it takes into consideration all income categories and thus highlights income differences. A major methodological problem is open-ended income distributions at both the bottom and top-end of the size distribution of income.

Theil inequality index

The entropy-based Theil inequality index is often used in the study of income inequality for its additive decomposable property.⁴ The underlying assumption of the decomposability property is that individuals can be grouped in a mutually exclusive and completely exhaustive way such that total inequality can be decomposed into between-group and within-group components. The formulae for the Theil index is given in **Table 8**.

Quintile and decile ratios

Another common form of presenting income inequality is the ranking of income data into either deciles or quintiles or in terms of income shares. The advantage is the ease of computation of these decile and quintile ratios. The disadvantage is that it ignores changes in income distribution between these extreme groups.

INCOMES AND EARNINGS TRENDS IN SINGAPORE

⁴ See Bourguignon (1979) for discussion of the properties of inequality measures.

Trends in Household Size

There is a clear demographic shift towards smaller household sizes.

- The Household Expenditure Surveys show modal household size has declined from 5 persons in 1972/73 to 4 persons in subsequent surveys. Households with less than 4 members constituted about 61% of total households in 1992/93 versus 27.8% in 1972/73.
- Data from the population censuses show that average household size fell from 4.2 persons in 1990 to 3.7 in 2000. Households with no family nucleus, including single-person households rose from 8.7% to 12.3% of total resident households, while one-family nuclear households formed 82.1% of all households in 2000.

Trends in Household Income

Household expenditure surveys show the following (see **Table 9**)

- Average monthly household income (nominal) increased from S\$591 in 1972/73 to S\$5,262 in 1997/98.
- In 1972/73 the average monthly household income per person was S\$175 for a household size of two, versus only S\$83 for household size of more than 5 persons, or a ratio of 2.1. In 1997/98, the range is from S\$1791 to only S\$987, or a ratio of 1.8. Although the ratio has fallen, the absolute gap has widened over time.
- The proportion of households in the lowest monthly household income group (under S\$500) fell from 57.3% in 1972/73 to only 0.6% in 1992/93, while households with monthly income over S\$1,500 rose from 5.7% to 80.8% of total households. These are shifts in nominal income groups, not in real income groups.
- As a measure of income inequality, the ratio of the average income of highest quintile (20%) of households to the lowest quintile of households rose from 6.6 in 1977/78 to 9.3 in 1997/98.

Population census data show the following (see **Table 10-12**)

- The average monthly household income from work has increased from S\$3,076 in 1990 to S\$4,943 in 2000, representing an annual nominal growth rate of 4.9% and real growth rate of 4.6%, reflecting the stability of consumer prices in the 1990s.
- The average household size decreased from 4.2 persons in 1990 to 3.7 persons in 2000. This translates to a monthly income of S\$732 per person in 1990 and S\$1,336 in 2000. The faster growth in average household income per person reflects the household size effect.
- The average (mean) household income from work rose from S\$1510 in 1990 to S\$3114 in 2000, or 2.06 times. There are significant differences in average household incomes among the three major ethnic groups in Singapore. In both 1990 and 2000,

Chinese households have the highest average incomes, followed by the Indians and Malays. The average income of Chinese households grew by 2.05 times between 1990 and 2000, while those of the Indians grew by 2.25 times and those of the Malays grew by 1.86 times. The Malay community (13.9% of resident population in 2000) has failed to catch up with the dominant Chinese community (76.8%), while the Indian community (7.9%) is catching up.

- The ratios of the top to bottom quintiles of households by income from work fell from 14.4 in 1980 to 11.4 in 1990 and rose again to 20.9 in 2000, showing that income inequality improved in the 1980s and deteriorated in the 1990s. The decile ratio for the three census years are 45.2, 26.1 and 275.5 respectively, magnifying the trend in quintile ratios. It is highly surprising that the average household income of the lowest decile declined from S\$370 in 1990 to only S\$61 in 2000, even in nominal terms. One possible explanation for the very low average income of the bottom 10% of Singapore households could be the inclusion only of employment income. There is a growing number of Singapore households comprising of retirees and the aged ---- their monthly and annual incomes are derived not from wages and salaries but from pensions, property income, and transfer payments. The **Chia (1995)** study based on special tabulations from the 1990 population census shows that the lowest 10% of households include many households living in luxurious private housing, owning cars and having household maids.

- While the high growth rate in average household income, exceeding 4.5% a year in real terms, is commendable, the income level of the bottom of the size distribution is very surprising in a seemingly affluent Singapore. In 1990, 16.0% of the resident households had employment earnings of under S\$1000 per month; in 2000 this proportion while falling to 12.6% remains a high 12.6%. In 2000, over one quarter of Singapore households had monthly household incomes from work that fell below S\$2,000.

Trends in Labour Force Earnings

Figure 2 shows the earnings distribution curves for 1979, 1985, 1991, 1998 and 2001. An L-shaped distribution characterises the earnings profile in 1979. The distributions for 1985-1991 became bell-shaped, while the distributions for 1998-2001 have become flatter. Modal incomes have shifted from the under S\$400 group to the S\$400-1499 group and finally to the S\$1500-2999 group, reflecting both the growth in real incomes as well as the inflation factor.

Table 13 give an overview of the earnings distribution of employed persons in Singapore between 1979 and 2001 in aggregate and by economic sectors.

- For the 1979-2001 period, the number of workers in the lowest monthly earnings category (under S\$400) fell by more than half to only 9.1% of the employed in 2001. Conversely, the number of workers earning over S\$1,500 per month accounted for over half of the employed in 2001.

- With a finer breakdown of the higher income classes in more recent labour force survey reports, it is shown that the proportion of employed with monthly income between S\$3,000-S\$5,999 has grown from a modest 6.2% of total employed in 1991 to 20.5% in 2001. This shift towards higher incomes reflect real growth in wages and

salaries as well as the inflation factor.

- The impact of the 1997 financial crisis on earnings is mixed. The number of workers earning less than S\$400 per month has increased by 10%. However, the number of workers in the highest income category of over S\$6,000 has increased by 24%.

- Earnings by industry show the impact of the industrial restructuring initiatives since the late 1970s. While the share of manufacturing in GDP remained at around 25% during 1979-2001, manufacturing workers earning less than S\$400 a month accounted for only 1.5% of total employed in 2001. Workers in the commerce and finance, insurance, real estate and business service sectors generally earn more than the rest of the sectors. Among the sectors, the community, social and personal services sector has a relatively larger pool of low income earners. * On the impact of economic restructuring on earnings of different occupational groups, the proportion of employed in the highest earnings categories of managers, professionals and technicians rose from 11.4% of employed in 1979 to about 42% in 2001. These categories accounted for 86.3% of total employed with monthly income greater than S\$3,000 in 2001. Conversely, the proportion of clerical, service and sales workers declined from 42.2% in 1979 to 24.7% in 2001 and monthly earnings generally fall below S\$3,000. Production workers and labourers constituted 65% of total employed in the lower earnings category in 2001.

Survey of Studies on Income Inequality in Singapore

Most of the research on income distribution in Singapore has focused on the size distribution of income of households and individuals rather than the functional distribution of income between labour and capital or distribution between domestic and foreign income earners. As a city-state, the issues of regional variations in income and rural-urban income gap are irrelevant.

Income inequality measured at the aggregate level masks important underlying trends. Various studies have focused on analysing income distribution trends with respect to ethnic groups, occupational and industry groups, age, educational attainment and gender in Singapore.

Functional distribution of income

- **Pang (1975)** estimated total personal income share of GDP to be around 45% in 1966, falling to around 40% in 1973. He explained the declining labour share as probably due to the growing inflows of foreign direct investment, with generous tax incentives and concessions, and a growing share of GDP that was represented by profits and repatriated out of Singapore.

- **Tan (1997)** estimated the proportion of labour income in GDP (in nominal terms) to be around 30% - 40% between 1974 and 1994.

- **Soon and Ong (2001)** showed that Singapore's remuneration share of GDP was 42% in 2000, which is somewhat lower than the other Asian NIEs (South Korea, Hong Kong and Taiwan) and considerably lower than that of many developed economies (Japan, US and UK). (see **Figure 3**)

The authors concluded that Singapore has a First World per capita income, but a wage share which is more characteristic of Third World developing countries.

- Data from the *2001 Economic Survey of Singapore* shows the labour remuneration accounted for 46.4% share of nominal GDP in 2001.

Size distribution of income

Various studies have used different sources of data, and adopted different time periods and computational methods, resulting in different estimates of income inequality in Singapore. **Table 14** summarises and compares the Gini ratios and Theil indices from various studies.

- In **Pang (1975)** and **Rao and Ramakrishnan (1980)**, where the time frame in both studies referred to pre-1980, Gini coefficients were found to have declined between 1966-1973 and 1966-1975 respectively. Due to different income data sources and methodologies, **Pang (1975)** reported Gini ratios of 0.457 in 1966 and 0.415 in 1973. **Rao and Ramakrishnan (1980)** reported higher Gini coefficients of 0.50 in 1966 and 0.45 in 1975. Both studies show declining Gini coefficients. The authors pointed to the employment-oriented development strategy to expand employment opportunities that drove the decline in income inequality.

- **Rao (1996)** found the Gini coefficients approximated a U-shaped trend during 1966-1993, i.e. falling income inequality followed by rising income inequality. Except for the periods between 1978 and 1981 when the Gini coefficients for earnings in Singapore were at a low of 0.43, the coefficient was generally between 0.46 and 0.48 during the 1973-94 period.

- **Rao (1996, 1999 and 2000)** pointed to various industrial and labour market policies that resulted in the U-shape trend in income inequality. The decline in the Gini coefficient in the 1970s could be attributed to the substantial rise in female employment and a decline in unemployment. However, economic restructuring towards higher skill and technology intensive and higher value added activities in the early 1980s resulted in the labour force Gini coefficients rising from 0.43 in 1981 to 0.46 in 1982. The main turning point in income inequality trend can thus be traced to pre-1980 policy that pursued labour intensive industrialisation and employment expansion and post-1980 economic restructuring efforts towards skill and technology intensive and higher value added economic activities.

- **Chia (1995)** used the 1990 population census data, both published as well as tabulations specially generated by the Department of Statistics for the study of income distribution in Singapore. The Gini coefficient declined between 1980 and 1990 intercensal years. Likewise, based on the decile share method, income inequality based on income from work had declined between 1980 and 1990, with the ratio of the top quintile income to the bottom quintile income falling from 14.2 in 1980 to 11.4 in 1990, while that between the top two deciles and the middle three deciles fell from 3.5 to 3.0. The share of total household income from work commanded by the bottom quintile rose from 3.6% to 4.2% while the share of the top quintile fell from 52.0% to 48.2%. Chia cautioned that the population census data was based mainly on income from work and a comparison of income from all sources may modify the results. Likewise, no

adjustments were made for different taxes between income groups and subsidies to housing, education and health and other income transfers to the lower income group.

- **Foo (1998)** obtained Gini coefficients that ranged from a low of 0.4237 in 1990 to a high of 0.4929 in 1996 for the 1973-96 period. He concluded that Singapore achieved economic growth without serious deterioration in income inequality. The promotion of capital intensive industries increased the demand for professional and technical skills and the influx of foreign labour may have resulted in a growing gap between wages between skilled and unskilled labour. However, various institutional factors have been in place to maintain income inequality at stable levels. For instance, the National Wage Council is the leading agency in making wage recommendations, public housing schemes and progressive taxation that helped to mitigate income inequalities produced by the market place.

Singapore Department of Statistics (2000) highlighted an increased disparity in household income from work between 1990 and 1999 with the Gini coefficient rising from 0.436 in 1990 to 0.467 in 1999. Other indicators supporting the increase in income disparity include:

- the proportion of household with monthly earnings of under S\$1,000 decreased while those with higher earnings increased. The proportion of households earning less than S\$1,000 monthly fell from 16% in 1990 to 11.9% in 1999. The proportion of households earning over S\$7,000 monthly increased from 7.3% in 1990 to 18.8% in 1999.

- Though the average household income fell from S\$4,822 in 1998 to S\$4,691 in 1999, earnings were much higher than that in 1990 which averaged S\$3,076. The average monthly income from work for the bottom quintile of households was around S\$650 in both 1990 and 1999, while the average monthly for the top quintile of households increased from S\$7,410 in 1990 and \$11,694 in 1999. The earnings of the top decile increased by 2.6% in 1999 despite the declines in earnings for the rest of deciles due to the effects of economic downturn.

During the financial crisis, income inequality worsened in 1999, and can be largely attributed to the economic slowdown, higher unemployment and re-employment at lower wage rates. In the national pursuit of a knowledge-based economy, the wage premium for the professional and skilled workers are likely to rise. There will be a group of households that lags in income growth, either as a result of structural unemployment or as a result of retirement from the workforce.

Sectoral distribution of income

- **Rao (2000)** found relatively lower Gini coefficients for the manufacturing, construction, transport and communications sectors between 1966 and 1989. The services and commerce sectors, on the other hand, had higher Gini coefficients of around 0.5.

- **Soon and Ong (2001)** showed there were substantial sectoral variations in the wage share of value added, ranging from a low of 31.8% in manufacturing, to a high of 53.6% in hotels & restaurants and 62.2% in construction. The wage share is a function of

numbers employed and the wage rate.

Occupational distribution of income

- **Rao (2000)**: In terms of inequality among occupations, the more standardised jobs (such as clerical and labourers) showed lower Gini coefficients (less than 0.3) in 1989 while professional and technical jobs reported higher Gini coefficient of 0.43.

Educational attainment

Educational attainment does seem to have direct impact on earnings. Almost 45% of degree holders in 2001 had gross monthly earnings greater than S\$5,000 while less than 2% of employed persons with less than lower secondary education fell within this high income category.

Ethnic groups

Pang (1975) concluded that not all races moved towards greater income equality between 1966 and 1973. The Gini coefficients for the Malays and Chinese declined during 1966-73 while higher Gini coefficients were reported for the Indians.

Gender

Mukhopadhaya (2001b) studied the income diversity between male and females in the labour force between 1975 and 1999. The average Gini coefficients for males were 0.441, 0.471 and 0.473 during the 1970s, 1980s and 1990s respectively. The Gini coefficients for females were 0.364, 0.389 and 0.442 for the respective years. The more significant change in levels of income inequality for females over the years is mainly a result of increased participation of women in low-paying jobs. Though higher educated females may have reduced the male-female income inequality in Singapore, female participation in male dominated industries remains low. In addition, workforce for women aged 35 years and above constituted small proportion of the workforce.

Foreign-domestic distribution of income

- The Department of Statistics has been compiling the "indigenous GNP" of Singapore since 1966, originally intended to show that Singapore is not as developed as its GNP or GDP per capita statistics indicate. Indigenous GNP is defined as "aggregate value of output accrued to Singaporeans". The non-indigenous (foreign) share of GNP rose from 4.8% in 1966 to 26% in 2000.

- The **MTI (2001)** study attempted to quantify the contribution of "foreign talent" to Singapore. The percentage share of GDP contributed by foreign workers on employment passes (managerial/professional) and work permits (lower skilled) rose from 7.2% in the 1986-1990 period to 40.7% in the 1991-2000 period.

Income Distribution in Singapore Using Theil Index

Empirical studies on income distribution in Singapore have pointed out that income inequality has increased in Singapore in the 1990s.

Tan (1997) concluded that the labour force Theil indices lie within a small range of 0.17 and 0.20 between 1974 and 1994. In decomposing the Theil indices by gender, age group, educational attainment, industry and occupation, it was concluded that the significant determinants in income inequality in Singapore were age, education attainment and occupation.

This section will focus on the changes in the educational profile, occupational structure and growing gap in skills and explore both the trends in the size and sectoral distribution of income among workers in Singapore.

Data

Gross monthly income of employed persons (15 years and above) from the Singapore Labour Force Survey provides the main data source for the analysis of income inequality between and within workers grouped in accordance to occupation, industry, and the level of educational attainment for selected years during 1978-2001. The unit of analysis in this study is the individual. The income data has not been adjusted for income taxes and subsidies

In the annual labour force surveys, data is presented in income classes with open-ended top and bottom income classes. The income classes at the two ends are adjusted such that the lowest income class will be “below S\$400” and the highest income class will “above S\$3000”.⁵ Taking the lowest income bound of S\$50 as assumed in Tan (1997) and Teo (2000), the mean for the lowest income class is estimated at S\$260. For the mean of the highest income class, data from the annual reports of the Singapore Inland Revenue Authority and the labour force survey are used in the estimation. The annual reports include the number of taxpayers in the respective income classes in accordance to their assessed income.⁶ The estimated mean for the highest income class range between S\$5800 in 1978 to S\$7400 in 1999.

At the aggregate level, the Theil inequality measures for the selected years between 1978 and 2001 show an increase in income inequality from the late 1980s till mid 1990s when income inequality started to decline, but remains at a level higher than that of the late 1970s.

Educational decomposition

Figure 4 shows the changes in the educational composition of the Singapore workforce between 1978 and 2001. In 1978, the largest group of Singapore workers, 62%, had less than primary education or no education, and an income share of 50%. In 2001, this proportion of poorly educated workers has decreased significantly. Instead, the largest group of workers, 60%, has secondary and higher level of educational qualification, commanding 83% of total income. Shifts in the educational composition among workforce have resulted in higher income inequality among workers. The within-group

⁵ The lowest income class in the labour force surveys before 1998 was under “S\$200” and “under S\$400” in subsequent years. The highest income class was reported to be “above S\$3000” before 1992 and “above S\$6000” in subsequent years.

⁶ See Tan (1997) for an explanation of estimation.

effect on income inequality is greater than that of the between-group effect. (see **Table 15a**)

Sectoral decomposition

From a mere 6.2% of total number workers in 1978 to 17.2% in 2001, the proportion of workers in Finance, Insurance and Real Estate sector has grown tremendously. The respective income share has also increased from 9.7% in 1978 to 23.5% in 2001. The other industry with an increase in the proportion of workers in 2001 was the Community and Personal Services industry, though there was a decline in the income share. (see **Figure 5**) From **Table 15b**, the level of income inequality between industry groups is very low, accounting for less than 5% of total income inequality between 1978 and 2001. The within-industry effects account for the major shifts in income inequality.

Occupational decomposition

Along with the changes in the economic structure, the demand for skilled workers has increased over the years. In the 1970s, labour intensive manufacturing created the demand for less skilled workers. The proportion of lower skilled workers accounted for more than 30% of total employment and around 28% of total income in 1978 (see **Figure 6**). After two decades, professionals and technicians account for 25% of total employment and 47% of total income. Unlike the decomposition results for education and industry groupings, within-occupations effect is not the dominant force in affecting total income inequality (**Table 15c**). In 1978, the within-group effect accounted for 70% of total income inequality. In 1990s, the between-group effect on total income inequality has increased to around 50%.

FACTORS AND POLICIES IMPACTING ON INCOME INEQUALITY

Singapore's economic performance since political independence in 1965 has been characterised by high GDP growth rates resulting in per capita income ranking among the top 10 in the world. The incidence of poverty, by any measurable yardstick, has dropped dramatically, so that the poor forms only a small minority in Singapore.

The overwhelming majority of lower income households in Singapore live in owner-occupied apartment blocks built by the government through the Housing and Development Board. Studies of the low-income households show not only overwhelming home ownership but also ownership of consumer durables such as television sets, refrigerators and telephones. The truly poor households are those of the elderly retired without savings, assets or relatives; households with young children and no breadwinners; and the involuntarily unemployed because of physical and mental disabilities. These poverty groups and individuals depend on government agencies as well as private voluntary organisations for welfare assistance.

While Singapore has largely resolved its poverty problem through high and sustained economic growth, the economic growth impact on income distribution has been mixed, with falling inequality in the 1970s and major part of the 1980s and rising income inequality evident in the 1990s. Income inequality has been shaped by the pattern of economic growth and various government policies which are directly or indirectly redistributive in impact.

Determinants of Income Inequality

There are three main sources or components of household and personal incomes:

- *Income from employment*: refers to income from employment including bonuses and commissions, earnings of self-employed, and withdrawal of profits from unincorporated businesses for individual use.

- *Income from assets*: refers to income derived from ownership of assets, such as interest earnings on bank deposits and bonds, dividends from stocks and shares, rental income from property, and profits from businesses.

- *Transfer income*: refers mainly to transfers in cash and kind from the government for the low-income and the disabled, as well as benefits in cash and kind provided by members of the family and community, and other civic or voluntary organisations.

Inequalities in household and personal incomes arise from both differences in income from employment as well as income derived from assets.

- Income from employment varies with occupation, educational attainment, age and experience, gender and ethnicity.

- Income from assets are from possession of land and property, ownership of business enterprises, and ownership of equity stocks, bonds and other financial assets. Modern Singapore is built by migrants engaging in business or in employment. There is no landed aristocracy or oligarchy. There are no tycoons owning forest plantations, oil wells or mineral deposits. Wealth in urbanised Singapore is generated by successful business enterprises and by earnings of the professional and managerial classes.

Unlike personal incomes, the income inequality of households is also affected by the number of working persons per household. Two opposing forces have been at work over the decades. On the one hand, the trend towards nuclear households has reduced the number of working members in the household. On the other, the increased labour force participation rate of women, and more particularly of wives, has raised the number of working persons in the household. Data from the 1990 population census show that the wide variations in household income are due to both the higher earnings of working persons as well as the larger number of working persons in the upper income households as compared to the lower income households.

- Households belonging to the top quintile income group have an average 3.1 working persons, but households in the bottom quintile income group have an average of only 0.85 working persons.

- Households belonging to the top quintile income group have an average income per working person of S\$2,400 as compared to only S\$780 for those in the bottom quintile.

Pattern of Economic Growth

Changes in income distribution respond to both changes in the production structure of the economy and changes in the educational attainment and skills composition of the

workforce.

In the late 1950s and early 1960s Singapore was suffering from unemployment rates of over 10%. On the supply side, there was high population and labour force growth. On the demand side, the traditional economic pillar, entrepot trade, was stagnating and facing uncertain growth prospects as neighbouring countries developed their own ports and engaged in direct trading and as the prices of primary commodities (which formed the bulk of entrepot trade at the time) went into secular decline.

Drastic anti-natal policies were introduced in the 1960s and 1970s in an effort to control population growth, lessen the supply push on the labour market, and release resources for investments in physical and human capital. The anti-natal policies, together with sharp increases in the educational attainment and labour force participation of women, contributed to rapidly falling fertility rates and slowed down the growth in labour supply.

In the 1960s and 1970s, Singapore's industrialisation strategy focused on labour intensive manufactures for the export market. Labour intensive industries such as garments, food processing and electronics assembly grew rapidly, creating jobs for the large pool of unskilled and semi-skilled workers. Not constrained by the small size of the domestic market (as would be the case with import substitution) and with foreign direct investment playing a crucial role in providing industrial capital, industrial technology and export marketing capability, the Singapore economy enjoyed double-digit growth and unemployment and poverty incidence declined markedly. Income distribution improved during this period.

The strategy of economic restructuring and upgrading in recognition of the end of the labour-surplus economy and the increasingly tight labour market was embarked on in the early 1980s. This exercise was interrupted by the serious economic recession of 1985-86, when job retrenchments rather than job creation became prevalent. Following economic recovery in the late 1980s, economic restructuring and upgrading was continued in earnest towards a knowledge-based economy, with high value added manufacturing and high value added services as the twin engines of economic growth. Employment opportunities for the highly skilled expanded rapidly while the unskilled and semi-skilled are increasingly confronted with structural unemployment. The earnings gap between the highly skilled and the unskilled widened further.

Labour and Wage Policies and Practices

National Wages Council

Singapore has not instituted any statutory minimum wage, putting the emphasis on employment creation rather than income maintenance. It has to be recognised, however, that even in countries where there is a statutory minimum wage, a sizeable segment of the workforce still works below the minimum, as an alternative to being unemployed.

With the end of the labour-surplus phase of economic development in the early 1970s, and government concern that sharp upward wage pressures would seriously undermine Singapore's competitiveness, the National Wages Council was formed in 1972. It has a tripartite representation of government, employer and labour union, with the objective of

prescribing orderly annual wage increases based on the performance of the economy and consumer price changes. In years of economic recession, the Council recommended wage restraint and even wage cuts. In years of high inflation, recommended wage increases take into consideration the sharp rises in consumer prices, particularly of basic goods.

The existence of the NWC has served to reduce the annual variations in wage changes, with corresponding impact on income inequality.

Foreign labour

Since the mid-1970s Singapore has become increasingly dependent on foreign labour, which now constitutes over one quarter of the labour force. Foreign labour is allowed into the country under two schemes ---- employment passes for professionals and managers, and work permits for semi-skilled and unskilled workers in manufacturing, construction and services. The large presence of foreigners have stretched the wage distribution in Singapore. At the upper end, the managerial and professional personnel in MNCs based in Singapore are paid expatriate salaries which reflect the remuneration levels of their developed home countries in Japan, Western Europe and North America. This also has a rub-off effect of raising the remuneration packages of local managers and professionals working in the MNCs and other business firms. At the lower end, the unskilled and semi-skilled foreign workers are paid lower wages than their counterpart Singaporeans, although much higher than the wage levels of their less developed home countries. The large pool of foreign semi-skilled and unskilled workers have kept a lid on the supply price of local unskilled and semi-skilled labour. Thus the presence of foreign labour at the two ends of the skills spectrum has raised the skills premium in Singapore and widened the earnings gap, not only between foreigners and locals but also between the more skilled and the less skilled.

Taxation system

The income inequality studies surveyed thus far are all based on pre-tax incomes of households and individuals. With a progressive income tax system, the post-tax income inequality should be very much reduced. Likewise, with government provisions of subsidised services such as public housing, education and healthcare, the real incomes and living standards of the low-income groups are raised and so contribute to a narrowing of the post-subsidy income distribution.

The individual income tax is progressive and a large proportion of low-income households and wage earners do not pay any income tax but are in receipt of various subsidised government services, so their real incomes are higher than their pre-tax-pre-subsidy incomes. On the other hand, the upper income groups are subject to the progressive personal income tax, whereas the subsidises from consumption of subsidised government services form a smaller proportion of their income than in the case of the low income groups. Hence their real incomes are much lower than their pre-tax-pre-subsidy incomes.

Changes in the tax structure in the past decade or so have reduced the equalising effect of Singapore's taxes.

- Singapore does not levy any capital gains tax but has an estate duty tax. However, taxes on estate duty have declined sharply over the years, so as to encourage thrift and savings and discourage the transfer of wealth abroad so as to escape taxes. Currently, real estate amounting to S\$ 6 million are exempt from estate duty, while mobile assets are subject to a 10% estate duty. This has enabled the rich to transfer larger amounts of wealth to the next generation and in turn have a negative effect on income inequality by raising the asset incomes of the wealthier classes.

- In an effort to encourage business enterprise, including foreign enterprises, the corporate income tax has been progressively reduced over the years, from over 40% in the 1960s to 25% currently. Tax concessions are increasingly introduced to encourage new investments in manufacturing and targeted service industries.

- Personal income tax rates have also been declining over the decades in an effort to encourage enterprise and the work and savings ethics, although it remains progressive in structure. Currently the marginal tax rate is 3% on annual chargeable income of S\$12,500, rising to the maximum marginal tax rate of 26% on annual chargeable income above S\$400,000. (see **Table 16** for schedule of tax rates).

- Unlike indirect income taxes, direct consumption taxes are regressive in nature unless they exempt the basic goods that dominate the consumption basket of the poor. In Singapore, consumption taxes on alcoholic drinks, tobacco products and gasoline have been raised progressively over the years, both to raise revenue as well as to discourage their consumption for social and health reasons. Their impact on income inequality is not known, since these are goods consumed by both the poor and the rich. To offset the reduced dependence of government revenue on direct corporate and personal income taxes and to broaden the revenue base, the government has introduced the Goods and Services Tax (GST) in April 1994. The 3% GST is imposed on almost all goods and services except the sale and lease of residential properties and certain financial services. With further reductions in corporate and personal income taxes targeted over the next few years, the government has raised the GST to 4% with effect from January 2003 and a planned rise to 5% in January 2004.

Subsidised public housing

Currently, over 90% of Singapore citizen households live in owner-occupied public housing constructed and maintained by the Housing and Development Board (HDB). Provision of subsidised housing by the public sector is the cornerstone of Singapore's shared growth and stakeholder society strategy. Government provision of low-cost housing since the early 1960s achieved several objectives --- removal of urban slums and improved urban planning and land use and housing for the poor and lower income groups.

HDB housing costs less than their private sector equivalents due to a number of factors:

- Under the Land Acquisition Act, the government has the authority to compulsorily acquire private land for public use (including that of public housing) at below prevailing market prices, which effectively represents a form of urban land reform. Over the years, however, the acquisition price has been raised to proximate more closely the market price.

- The HDB has been able to finance its housing construction through access to cheaper sources of funds, primarily from the Central Provident Fund and the Post Office Savings Bank.

- As the largest home builder in Singapore, HDB has been able to enjoy considerable economies of scale.

The extensive home-ownership in Singapore, both of public and private housing, was achieved through withdrawals of members' compulsory savings in the Central Provident Fund (CPF) to pay for their housing purchases. For the very poor households without CPF savings to buy HDB apartments on installment basis, the government makes available heavily subsidised rented apartments provided by the HDB. Households that exceeded the qualifying income ceiling for HDB housing, have to buy homes in the private housing market.

Comparison between the prices of public housing and private housing is difficult because of differences in size, quality and location. However, the *1993 Report of the Cost Review Committee* showed four examples of price differentials per sq metre of public and private housing in the same geographical vicinity --- in these examples, the private apartments cost more than double those of public apartments in terms of per sq metre. Of course it should be noted that private housing includes car parks and other amenities not found in public housing.

The aim of public housing policy is to ensure that the majority of Singaporeans could afford at least a 3-room or 4-room HDB flat. The HDB builds a wide range of apartment types and sizes to cater to the needs of various income groups. As a general guideline, HDB flats are priced at levels which ensure that 3-room and 4-room apartments are affordable to the average income household, while those with higher incomes could opt for 5-room and executive apartments. Government subsidy rates vary for various types of apartments. In the early 1990s, the subsidy rate for 3-room and 4-room apartments was about 30% of total development cost, while the subsidy rate for 5-room and executive apartments was about 10%. according to the *1993 Report of the Cost Review Committee*.

Apart from government subsidy on the sale prices of public housing, the government also provide subsidised mortgage interest rates and generous loan terms. In the early 1990s, the HDB mortgage rate, which is pegged at 0.1 percentage point above the CPF interest rate payable to members, is generally 2.5-3.5 percentage points below the prevailing market interest rates. In the past year, with the sharp drop in mortgage interest rates offered by commercial banks, the margin between the mortgage interest offered by commercial banks and by HDB has almost disappeared.

Subsidised education

All formal education from primary one to university are provided by the government, except for some schools provided by the foreign communities in Singapore.

Population censuses show that the educational attainments of the population and workforce are below those of the developed economies and even of some of the NIEs. Even by the 2000 population census, 42.7% of the non-student population had not more

than primary education qualifications, while only 17.9% had tertiary education in polytechnics and universities. This is a stock problem, reflecting older age cohorts of immigrants and Singapore-born who are illiterate or had very limited access to education during the colonial period. Their lack of educational attainment has depressed their earning capabilities and contributed to the high inequality of wage income.

There has been rapid expansion of primary education in the 1960s, secondary education in the 1970s and 1980s, and tertiary education in the 1980s and 1990s. School enrolment ratios for the age group 7-16 years has risen to 98.4% in 2000. The education policy of the 1990s is for 60% of each age cohort receiving tertiary education at polytechnics and universities.

Education in Singapore is heavily subsidised. The government bears all development costs of schools, polytechnics and universities. In addition, government subsidy for the operating costs ranges from 100% at the primary level to over 75% at the university level. Government subsidy rates on education is shown in **Table 17**. While the upper income groups have alternative sources of education, the low income groups are entirely dependent on the government for accessible and affordable quality education.

Subsidised health care

Health care in Singapore is provided by both the public and private sectors, with the former heavily subsidised for both hospitalisation as well as outpatient clinics.

Subsidy rates for public hospitals in the early 1990s are shown in **Table 18**. The subsidy rate is highest for the cheapest ward (Class C) and lowest for the most expensive ward (Class A). The long term policy target is to remove the subsidy on Class A wards, and maintain a subsidy rate of 80% for the Class C wards.

CONCLUSION

While high and sustained economic growth of the past 4 decades have led to the near-elimination of poverty, the evidence of income inequality is mixed. Income inequality improved in the 1970s but has generally worsened in the 1990s.

Why should income inequality matter if every one is better off, even though some are much better off and others are only slightly better off? Much depends on the sources of income inequality.

Singapore society is fairly young, so there is very little entrenched wealth that has been passed on from generation to generation. Wealth accumulation is not due to the privilege of being members of the aristocracy, oligarchy or land-owning class. Wealth accumulation is not due to political patronage or corruption. The major source of wealth generation is through success in business ventures, astute investment strategies, and high earnings of the highly skilled. There is a high degree of upward social mobility. A household in the lowest quintile or decile can rise to the top quintile or decile within one generation.

Educational attainment is observed to be an important factor in poverty reduction and income inequality. As globalisation intensifies and Singapore moves towards the

knowledge-based economy, the demand for skills will intensify and structural unemployment is likely to become more prevalent and those with low and unmarketable skills will be the losers in the new economy. To ensure continuing broad-based growth and upward social mobility, education should be accessible to all and should be affordable to the low income groups. The Singapore government has been exemplary in ensuring broad-based provision of good quality education for all at the primary and secondary school level. Tertiary education was limited in the past but there has been tremendous expansion of resources for tertiary education to ensure that 60% of an age cohort will receive either polytechnic or university education. Admission into tertiary institutions are based on academic merits, not on wealth and privilege. Students who cannot afford the tuition fees have access to scholarships, bursaries and loans.

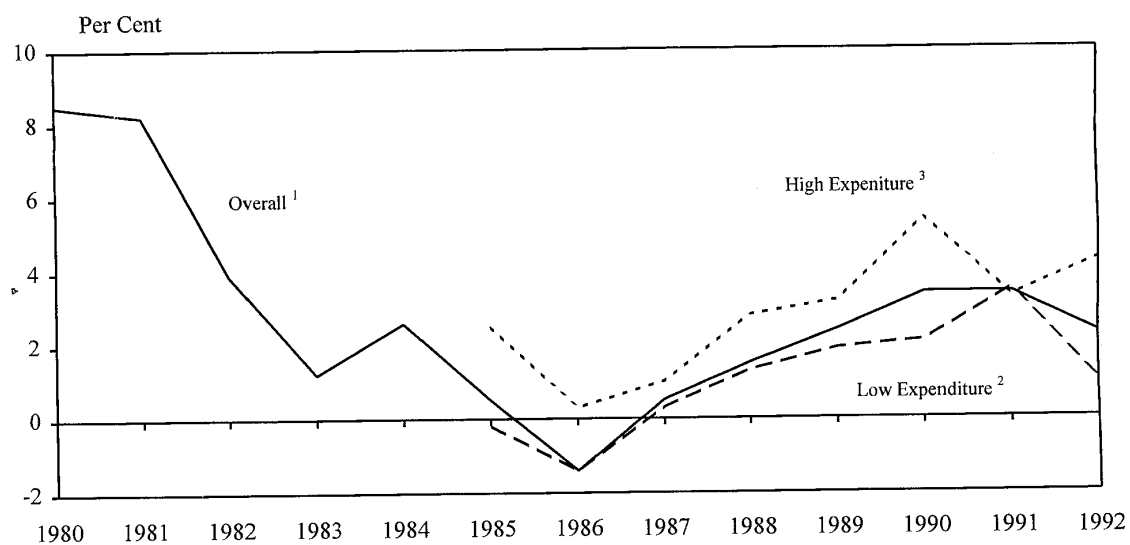
As Singapore society matures, accumulated wealth passed on to the next generation will become an increasingly important factor in income inequality in the years to come. The sons and daughters of the rich also have better access to education, not just in Singapore, but also to the best educational institutions in the world, giving them an advantage in the job market. A meritocratic society also creates of new class of underprivileged "underperformers". Hence the dictates of the market place have to be offset by government social policies that provide a helping hand to those who are unable, not unwilling, to help themselves.

References

- Bourguignon, Francois (1979), "Decomposable Income Inequality Measures", *Econometrica*, Vol 47, No. 4.
- Chia Siow Yue (1995), *Income Distribution and Profiles of Lower Income Households in Singapore*. Unpublished monograph for the Ministry of Community Development.
- Chia Siow Yue et al (1999), "Economic Development: An Update" in *Singapore Studies II: Critical Surveys of the Humanities and Social Sciences*, edited by Chua Beng Huat, Singapore: Singapore University Press.
- Conceição, Pedro and James K. Galbraith (1998), *Constructing Long and Dense Time-Series of Inequality Using the Theil Index*. Working Paper No. 259, LBJ School of Public Affairs, The University of Texas at Austin.
- Conceição, Pedro and Pedro Ferreira (2000), *The Young Person's Guide to the Theil Index: Suggesting Intuitive Interpretations and Exploring Analytical Applications*. UTIP Working Paper No. 14, The University of Texas at Austin. http://utip.gov.utexas.edu/web/workingpaper/tuip_14.pdf.
- Cowell, Frank A. (1995), *Measuring Inequality*. London: Prentice-Hall/Harvester Wheatsheaf.
- Foo, Yeow Wah Gabriel (1998), *Income Inequality in Singapore*. Academic exercise-School of Management, Faculty of Business Administration, National University of Singapore.
- Inland Revenue of Singapore, <http://www.iras.gov.sg>
- Krongkaew, Medhi (1994), "Income Distribution in East Asian Developing Countries: An Update", *Asian-Pacific Economic Literature*, Vol 8. No. 2, pp. 58-73.
- Lim, Chong Yah and Associates (1988). *Policy Options for the Singapore Economy*. Singapore: McGraw Hill.
- Mukhopadhyaya, Pundarik (2001a), *Changes in Social Welfare in Singapore 1982-1999*. Department of Economics, National University of Singapore, Working Paper No. 0120. <http://www.fas.nus.edu.sg/ecs/pub/wp/wp0120.pdf>
- Mukhopadhyaya, Pundarik (2001b), "Changing Labor-Force Gender Composition and Male-Female Income Diversity in Singapore", *Journal of Asian Economics*, Vol. 12, No. 4, pp. 547-568.
- Pang, Eng Fong (1975), "Growth, Inequality and Race in Singapore", *International Labour Review*, Vol. 3, pp. 15-28.
- Rao, V. V. Bhanoji and M.K. Ramakrishnan (1980), *Income Inequality in Singapore-Impact of Economic Growth and Structural Change 1966-1975*. Singapore: Singapore University Press.
- Rao, V. V. Bhanoji (1996), "Income Inequality in Singapore: Facts and Policies", in Lim Chong Yah (ed), *Economic Policy Management in Singapore*. Singapore: Addison-Wesley, pp. 383-396.
- Rao, V. V. Bhanoji (1999), "East Asian Economies- Trends in Poverty and Income Inequality", *Economic and Political Weekly*, Vol. 34, No. 18, pp. 1029-1039.
- Rao, V. V. Bhanoji (2000), "Income Distribution in Singapore: Trends and Issues", *The Singapore Economic Review*, Vol 35, No. 1, pp. 143-160.
- Singapore Department of Statistics (1995), *Income Growth and Distribution*. Occasional Paper on Social Statistics.
- Singapore Department of Statistics (2000), *Is Income Disparity Increasing in Singapore?* Occasional Paper on Social Statistics.
- Singapore Department of Statistics (2001), *Singapore Census of Population*.

- Singapore Department of Statistics, *Report on the Household Expenditure Survey*, various years.
- Singapore Ministry of Finance (2001), *Restructuring the Tax System for Growth and Job Creation*, Economic Review Committee – Sub-Committee on Policies Related to Taxation, the CPF System, Wages and Land. http://www.mof.gov.sg/erc/SubCommittee_Report.html
- Singapore Ministry of Manpower, *Report on the Labour Force Survey* of Singapore, various years.
- Singapore Ministry Trade and Industry (1993 and 1996), *Report of the Cost Review Committee*.
- Singapore Ministry Trade and Industry (2001), “Has Foreign Labour Contributed to Singapore’s Economic Growth? An Empirical Assessment”, *Economic Survey of Singapore*, Third Quarter 2001, pp. 39-47.
- Soon, Teck Wong and Ong Lai Heng (2001), *First World Per Capita Income But Third World Income Structure? Wage Share and Productivity Improvement in Singapore*. Statistics Singapore Newsletter, Economics Accounts Division, Singapore Department of Statistics.
- Tan, Felicity Kia Imm (1997), *Income Inequality Trends in Singapore: A Decomposition Analysis*, Honours Thesis, Department of Economics, National University of Singapore.
- Teo, Yee Lay (2000), *Gender and Racial Differences in Income Inequality: The Case of Singapore*, Honours Thesis, Department of Economics, National University of Singapore.

Figure 1: Singapore Inflation Rate By Expenditure Group

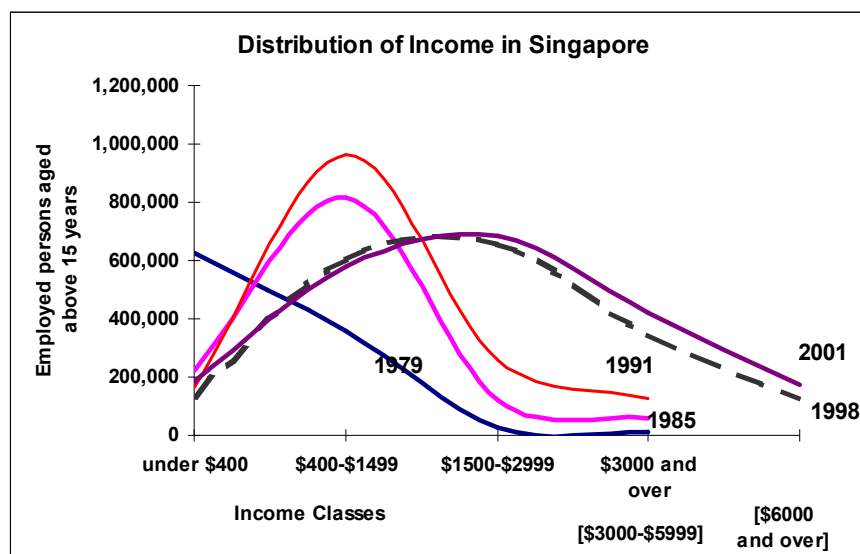


Source: Singapore Ministry of Trade and Industry, Report of the Cost Review Committee. 1996.

Notes:

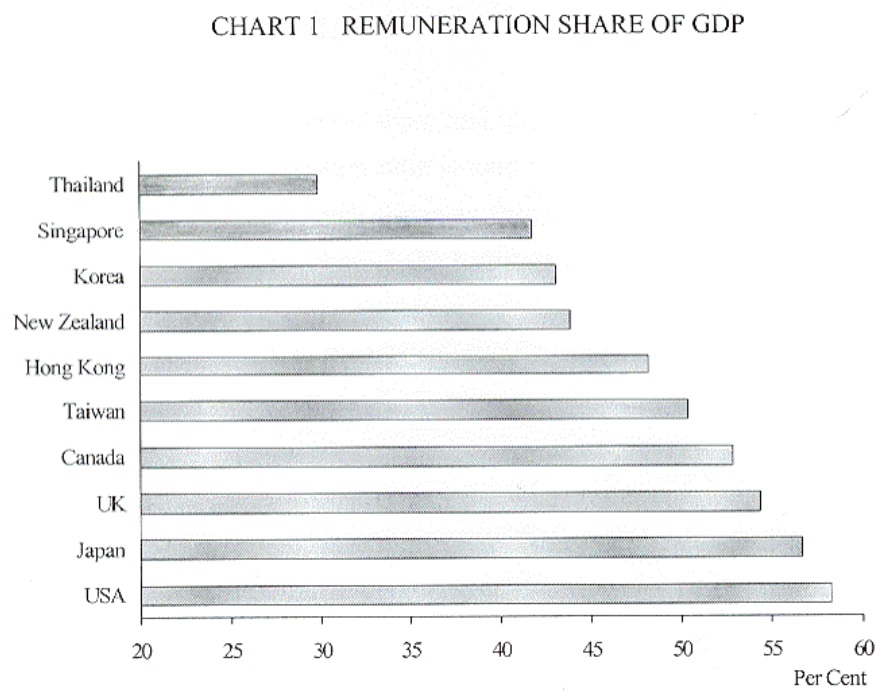
1. Monthly expenditure of \$500-4,999 in 1987/88
2. Monthly expenditure below \$1,000 in 1987/88
3. Monthly expenditure of \$3,000-\$5,999 in 1987/88

Figure 2



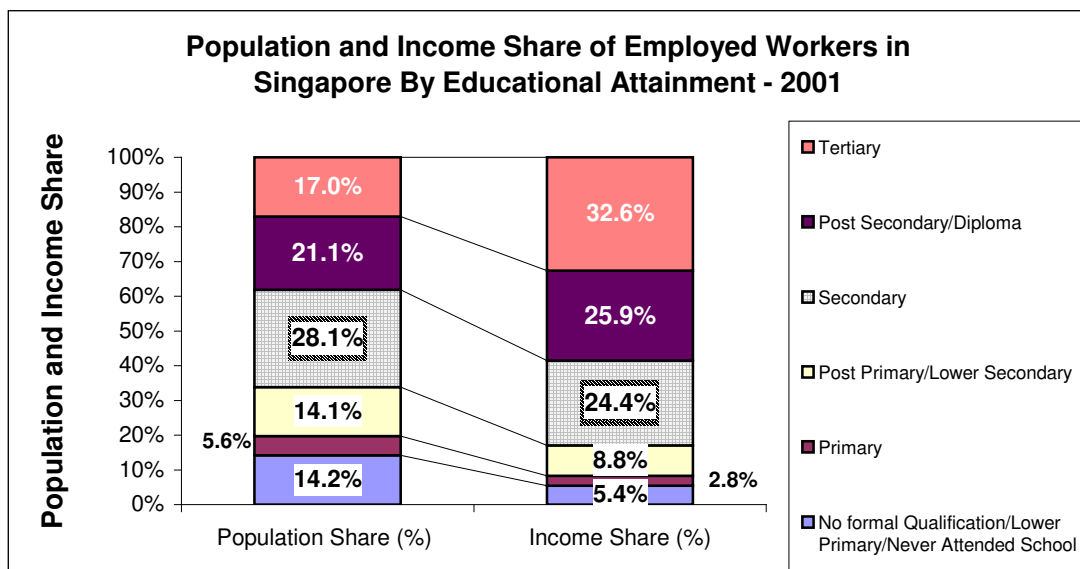
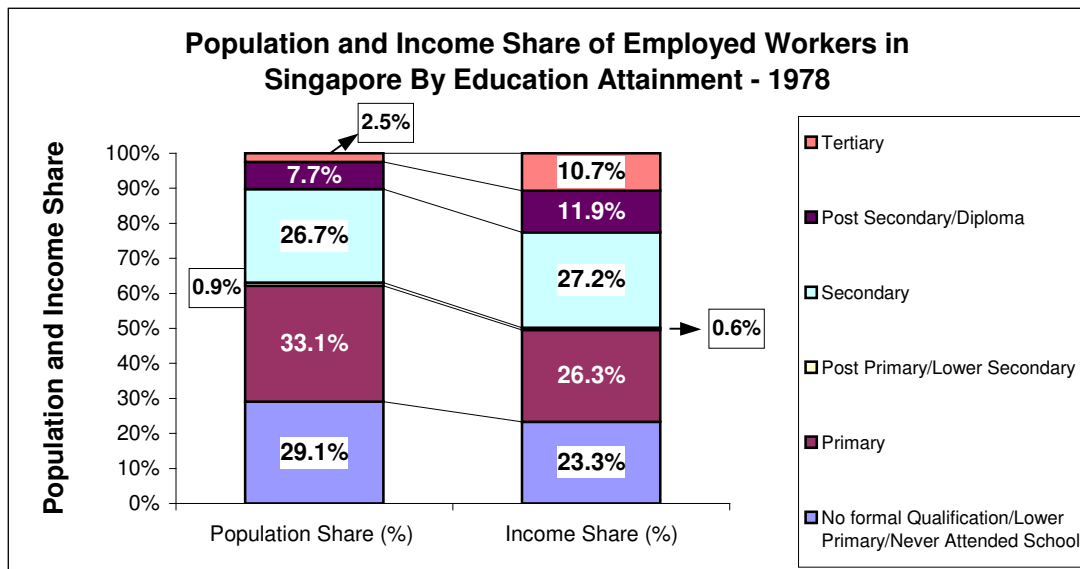
Sources: Singapore Ministry of Manpower, Report on the Labour Force Survey 1979, 2001; Profile of Labour Force in Singapore 1983-1994.

Notes: Data for 1996-2001 includes contributing family workers; Higher income classes available for survey data after 1991.

Figure 3

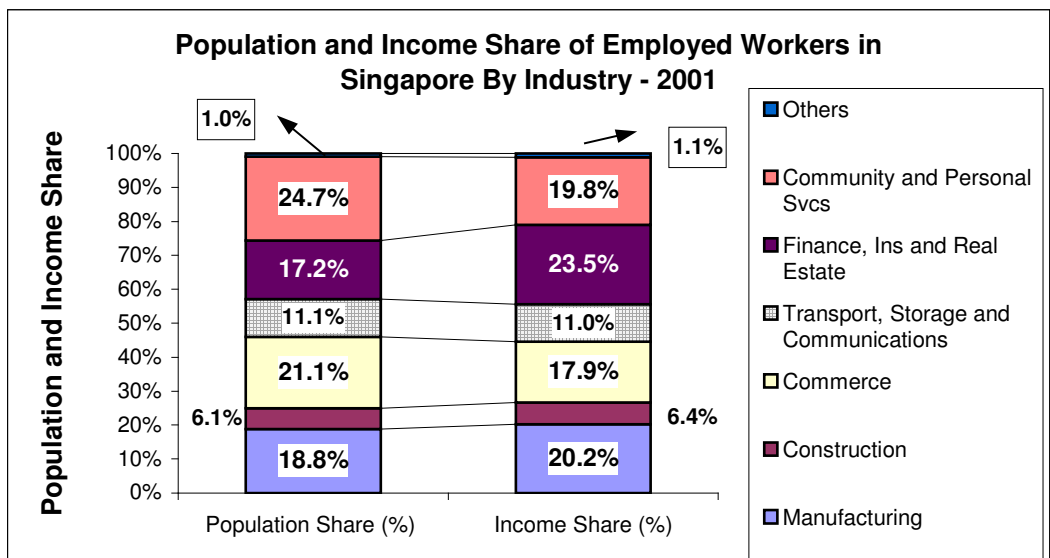
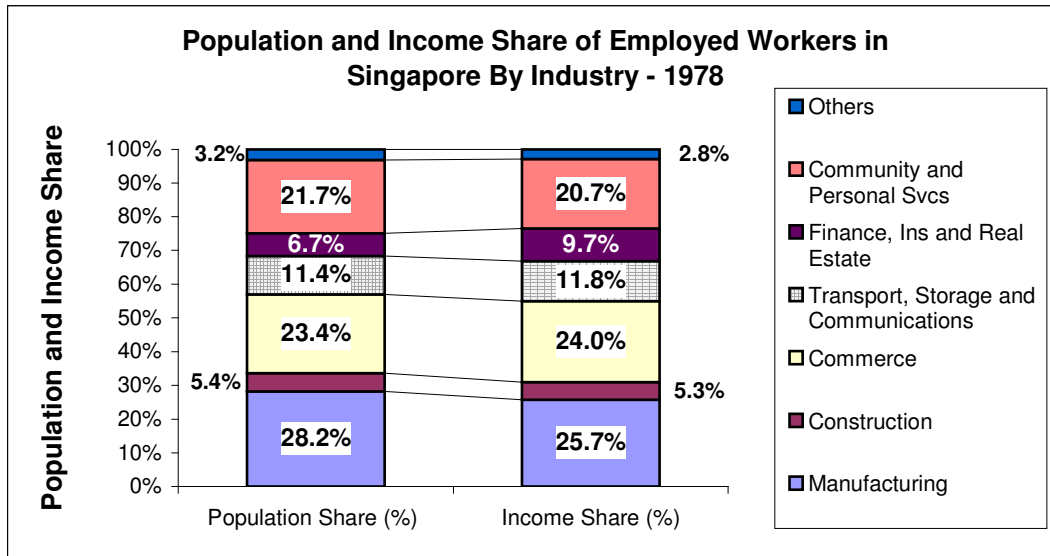
Source: Soon and Ong (2001)

Figure 4



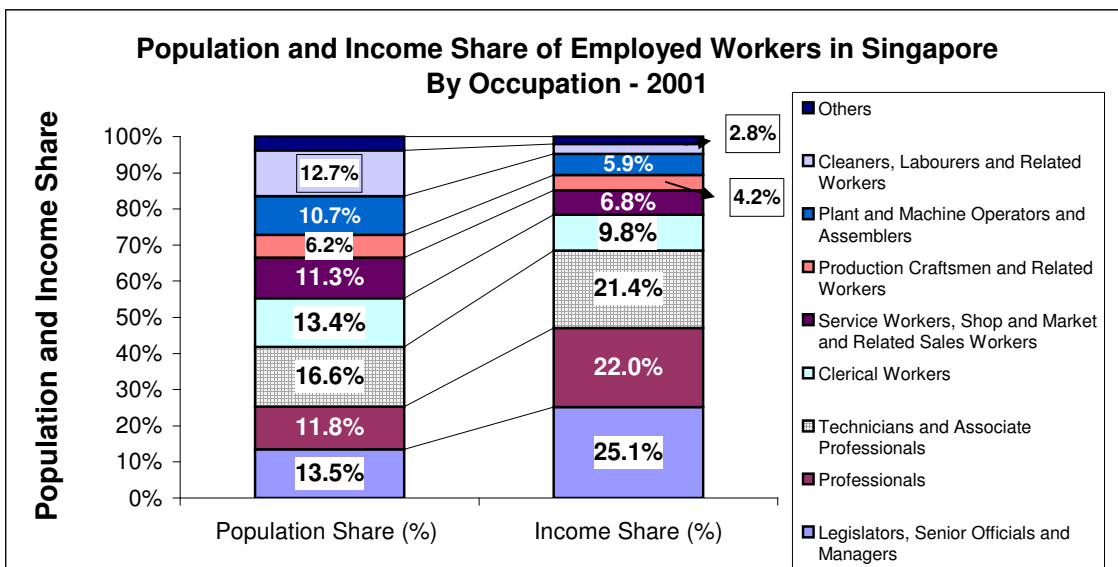
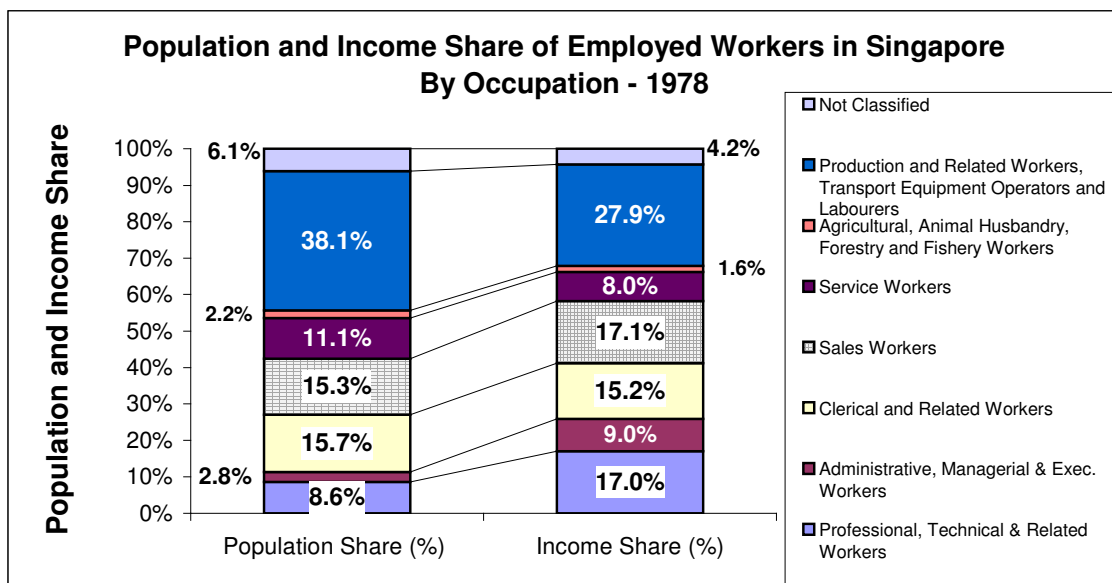
Sources: Report on Labour Force Survey in Singapore (1978, 2001)

Figure 5



Sources: Report on Labour Force Survey in Singapore (1978, 2001)

Figure 6



Sources: Report on Labour Force Survey in Singapore (1978, 2001)

Table 1: Annual Growth of GDP (1990 prices) and GDP per capita

	Annual Growth (%)	
	GDP (1990 prices)	GDP per capita (1990 prices)
1965-1970	12.93	10.81
1970-1980	9.01	7.37
1980-1990	7.29	4.82
1990-2000	7.85	4.78
1965-2000	8.73	6.37

Source: Singapore Department of Statistics, Trends Database

Table 2: Economic Structure in Singapore

	Composition of GDP (%)				
	1960	1970	1980	1990	2000
Goods Producing Industries	26.2%	37.5%	38.6%	34.7%	35.1%
Manufacturing	15.9%	23.7%	28.2%	27.1%	26.4%
Construction	5.4%	10.1%	7.7%	5.4%	6.8%
Utilities	1.6%	1.8%	1.8%	1.9%	1.7%
Other Goods Industries	3.3%	2.1%	1.2%	0.4%	0.1%
Services Producing Industries	66.7%	60.6%	62.1%	66.3%	66.3%
Wholesale & Retail Trade	22.1%	19.7%	16.1%	15.0%	16.7%
Hotels & Restaurants	4.0%	3.6%	4.1%	3.9%	2.8%
Transport & Communications	8.4%	6.9%	11.6%	13.2%	14.0%
Financial Services	2.6%	3.4%	7.1%	10.9%	10.6%
Business Services	11.8%	15.1%	11.3%	12.2%	11.5%
Other Services Industries	20.0%	15.2%	11.8%	11.1%	10.7%

Source: Singapore Department of Statistics, Trends Database

Table 3: Number of employed persons aged 15 years and above by industry and occupation in Singapore

<i>Number of employed persons</i>	1979						2001				
	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total		under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total
Total	624,083	357,973	25,561	10,711	1,018,328		186,130	580,844	685,181	594,586	2,046,741
Manufacturing	203,382	81,237	5,969	2,725	293,313		2,818	126,225	133,118	121,847	384,008
Construction	33,110	19,592	1,082	541	54,325		1,647	34,677	52,926	35,674	124,924
Commerce	144,732	83,338	5,761	2,621	236,452		19,809	174,991	146,642	90,465	431,907
Transport, Storage and Communications	56,341	58,629	2,600	1,269	118,839		1,864	64,326	105,073	56,914	228,177
Financing, Insurance, Real Estate and Business Services	33,879	31,738	4,222	2,142	71,981		3,987	65,930	119,289	162,593	351,799
Community, Social and Personal Services	136,185	73,187	5,616	1,227	216,215		155,658	110,317	120,461	119,768	506,204
Others	16,454	10,252	311	186	27,203		347	4,378	7,672	7,325	19,722

<i>% of income total</i>	1979						2001				
	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total		under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total
Total	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	100.0%	100.0%
Manufacturing	32.6%	22.7%	23.4%	25.4%	28.8%		1.5%	21.7%	19.4%	20.5%	18.8%
Construction	5.3%	5.5%	4.2%	5.1%	5.3%		0.9%	6.0%	7.7%	6.0%	6.1%
Commerce	23.2%	23.3%	22.5%	24.5%	23.2%		10.6%	30.1%	21.4%	15.2%	21.1%
Transport, Storage and Communications	9.0%	16.4%	10.2%	11.8%	11.7%		1.0%	11.1%	15.3%	9.6%	11.1%
Financing, Insurance, Real Estate and Business Services	5.4%	8.9%	16.5%	20.0%	7.1%		2.1%	11.4%	17.4%	27.3%	17.2%
Community, Social and Personal Services	21.8%	20.4%	22.0%	11.5%	21.2%		83.6%	19.0%	17.6%	20.1%	24.7%
Others	2.6%	2.9%	1.2%	1.7%	2.7%		0.2%	0.8%	1.1%	1.2%	1.0%

Sources: Singapore Ministry of Manpower, Report on the Labour Force Survey 1979 and 2001.

Table 4: Average Monthly Income and Proportion of Employed Person across Industry Sectors

	<i>Industry Sectors</i>	<i>Average Monthly Income (\$)</i>		<i>Population Share (%)</i>	
		2001	1978	2001	1978
1	Manufacturing	3,305.02	425.43	0.19	0.28
2	Construction	3,199.70	456.20	0.06	0.05
3	Commerce	2,605.54	477.61	0.21	0.23
4	Transport, Storage and Communications	3,028.58	483.53	0.11	0.11
5	Finance, Ins and Real Estate	4,184.32	671.63	0.17	0.07
6	Community and Personal Svcs	2,455.65	445.36	0.25	0.22
7	Others	3,650.75	415.03	0.01	0.03
<i>average income</i>		<u>3,064.56</u>	<u>466.48</u>		

Source: Estimated from Report on Labour Force Survey, 1978 and 2000.

Table 5: Number of employed persons aged 15 years and above by occupation in Singapore

<i>Number of employed persons</i>	1979						2001				
	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total		under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total
Total	624,083	357,973	25,561	10,711	1,018,328		186,131	580,846	685,180	594,586	2,046,743
Managers, Working Proprietors and Senior Officials	1,664	16,554	5,865	4,160	28,243		477	12,700	58,215	204,120	275,512
Professionals, Technicians and Associate Professionals	14,704	60,210	9,588	3,099	87,601		3,511	46,208	222,498	309,409	581,626
Clerical Workers	91,158	67,157	2,600	478	161,393		3,208	92,502	150,847	28,349	274,906
Service and Sales Workers	174,161	85,812	5,824	2,662	268,459		13,177	118,206	79,801	19,462	230,646
Production and Plant Workers and Labourers	276,612	115,075	1,185	125	392,997		121,024	300,304	164,588	21,414	607,330
Others	65,784	13,165	499	187	79,635		44,734	10,926	9,231	11,832	76,723
<i>% of income total</i>	1979						2001				
	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total		under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total
Total	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	100.0%	100.0%
Managers, Working Proprietors and Senior Officials	0.3%	4.6%	22.9%	38.8%	2.8%		0.3%	2.2%	8.5%	34.3%	13.5%
Professionals, Technicians and Associate Professionals	2.4%	16.8%	37.5%	28.9%	8.6%		1.9%	8.0%	32.5%	52.0%	28.4%
Clerical Workers	14.6%	18.8%	10.2%	4.5%	15.8%		1.7%	15.9%	22.0%	4.8%	13.4%
Service and Sales Workers	27.9%	24.0%	22.8%	24.9%	26.4%		7.1%	20.4%	11.6%	3.3%	11.3%
Production and Plant Workers and Labourers	44.3%	32.1%	4.6%	1.2%	38.6%		65.0%	51.7%	24.0%	3.6%	29.7%
Others	10.5%	3.7%	2.0%	1.7%	7.8%		24.0%	1.9%	1.3%	2.0%	3.7%

Sources: Singapore Ministry of Manpower, Report on the Labour Force Survey 1979 and 2001.

Note: Occupation classified as "others" in 1979 also includes workers not classifiable by occupation.

Table 6: Average Monthly Income of Employed Persons across Occupations

	<i>Occupation</i>	<i>Average Monthly Income (S\$)</i>
		2001
1	Legislators, Senior Officials and Managers	5,721.27
2	Professionals	5,699.75
3	Technicians and Associate Professionals	3,957.68
4	Clerical Workers	2,246.74
5	Production Craftsmen and Related Workers	2,079.90
6	Service Workers, Shop and Market and Related Sales Workers	1,840.49
7	Plant and Machine Operators and Assemblers	1,675.65
8	Others	1,603.35
9	Cleaners, Labourers and Related Workers	673.54

average income 3,064.56

	<i>Occupation</i>	<i>Average Monthly Income (S\$)</i>
		1978
1	Administrative, Managerial & Exec. Workers	1,512.40
2	Professional, Technical & Related Workers	926.81
3	Sales Workers	520.82
4	Clerical and Related Workers	449.02
5	Agricultural, Animal Husbandry, Forestry and Fishery Workers	349.35
6	Production and Related Workers, Transport Equipment Operators and Labourers	341.31
7	Service Workers	334.54
8	Not Classified	321.30

average income 466.48

Sources: Estimated from Singapore Labour Force Survey, 1978 and 2000.

Table 7: Calculation of Gini Coefficient

The **Singapore Department of Statistics (DOS)** computes Gini coefficient using the trapezoidal method. The formula given is:

$$G = 1 - \sum_{i=0}^{k-1} f_{i+1}(Y_i + Y_{i+1})$$

f_i = percentage frequency of households within the i -th decile group (or income level if income brackets are used);

Y_i = cumulative percentage of total household income up to the i -th decile group (or income level);

k = the total number of decile groups (or income intervals)

Another method of computing the Gini coefficient is averaging the differences of all possible pairs of incomes in the population and expressed as a proportion of total income (**Cowell, 1995**).

The formula is expressed as

$$G = \frac{1}{2n^2 \bar{y}} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|$$

n = population;

y_i = income of person i , $i = 1, \dots, n$;

y_j = income of person j , $j = 1, \dots, n$;

\bar{y} = arithmetic mean = $\frac{1}{n} \sum_{i=1}^n y_i$.

Table 8: Calculation of Theil Inequality Measure

The Theil inequality measure is as follows:

$$T = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\mu} \log \left[\frac{y_i}{\mu} \right]$$

n is the number of people in the population;

y_i is the income of individual i ;

μ is the mean income, $\mu = \frac{\sum_{i=1}^n y_i}{n}$;

$\frac{y_i}{\mu}$ is the ratio between individual income and average income.

The population of workers can be grouped into various categories. A decomposable income inequality measure such as the Theil inequality index can explain and highlight sources of income inequality in a given population. The additive property of the Theil inequality measure decomposes total income inequality into inequality “between” the groups (T_b) and inequality “within” the groups (T_w).

Assume the population of workers can be grouped into m groups, $g_1, g_2, g_3 \dots g_m$, with each group consisting of n_j individuals, such that $j= 1, 2, \dots, m$. (**Conceição and Ferreira, 2000; Galbraith and Kum, 2002;**). The Theil inequality measure can be de can be written as

$$T = \sum_{j=1}^m p_j r_j \log r_j + \sum_{j=1}^m p_j r_j T_j = T_w + T_b$$

$$T_j = \frac{1}{n} \sum_{i=g_m} \frac{y_i}{\mu} \log \left(\frac{y_i}{\mu} \right)$$

y_j is the average group income;

$r_j = \frac{y_j}{\mu} =$ proportion of average group income to overage average income;

$p_j = \frac{n_j}{n} =$ population proportion in each group

From the above equation, when all groups achieve the same share of income as its share of population, the Theil inequality measure is zero. Groups with higher income shares than population shares will register positive Theil indexes. Conversely, groups with lower income shares than the population shares will register negative Theil indexes respectively. However, the Theil inequality measure will be positive at the aggregate level. (**Conceição and Ferreira, 2000**)

Table 9: Household income data from report on household expenditure surveys in Singapore

(a) Size of household and average monthly household income

Household size	Average Monthly Household Income (\$)						Percent of Households (%)			
	1972/73	1977/78	1982/83	1987/88	1992/93	1997/98	1972/73	1987/88	1992/93	1997/98
2	350	753	1,552	1,596	2,586	3,582	4.8	10.7	13.3	n.a
3	405	847	1,606	1,804	3,078	4,370	9.8	17.9	18.4	n.a
4	583	977	1,656	2,057	3,492	5,008	13.2	27.8	29.5	n.a
5	548	1,009	1,653	2,287	4,330	6,255	16.4	22.8	22.7	n.a
6	576	1,102	1,997	2,769	5,058	7,893	14.1	11.8	9.7	n.a
7	611	1,131	2,117	3,195	6,025		12.7	5.3	4.0	n.a
8	600	1,240	2,539	3,408	7,053		9.6	2.1	1.3	n.a
9	643	1,172	2,527	3,724	7,313		7.6	0.9	0.6	n.a
10 or more	869	1,620	2,830	3,424	8,756		11.8	0.7	0.4	n.a
Total	591	1,066	1,724	2,213	3,829	5,262	100.0	100.0	100.0	n.a

(b) Size of household and average monthly household income per person

Household size	Average Monthly Household Income Per Person (S\$)					
	1972/73	1977/78	1982/83	1987/88	1992/93	1997/98
2	175.0	376.5	776.0	798.0	1,293.0	1,791.0
3	135.0	282.3	535.3	601.3	1,026.0	1,456.7
4	145.8	244.3	414.0	514.3	873.0	1,252.0
5	109.6	201.8	330.6	457.4	866.0	1,251.0
6	83.3	129.8	277.0	356.1	757.2	986.6
7						
8						
9						
10						

(c) Households and average household income by monthly household income

Monthly household income	% of households					
	1972/73	1977/78	1982/83	1987/88	1992/93	1997/98
Total	100.0	100.0	100.0	100.0	100.0	n.a.
Below \$500	57.3	21.5	4.8	3.8	0.6	n.a.
500-999	29.0	40.4	26.3	20.8	6.0	n.a.
1000-1499	8.0	19.0	21.6	21.4	12.6	n.a.
1500 and over	5.7	19.1	47.3	54.0	80.8	n.a.

(d) Average monthly income per household by quintile group of income
(\\$)

<i>Per household</i>	1978	1988	1993	1998
All Households	1,066	2,213	3,829	5,262
Lowest 20%	362	642	1,093	1,368
Second Quintile	571	1,106	1,891	2,588
Third Quintile	810	1,608	2,778	3,900
Fourth Quintile	1,173	2,388	4,150	5,770
Highest 20%	2,403	5,323	9,233	12,685
Ratio of Highest 20% to Lowest 20%	6.64	8.29	8.45	9.27

Sources: Singapore Department of Statistics, Report on the Household Expenditure Survey, various years.

Table 10: Number of resident households by income from work in Singapore

	Number of households (' 000)		% of total	
	1990	2000	1990	2000
Monthly household income (\$) - nominal				
<i>Total</i>	661.7	923.3	100.0	100.0
<i>Below 1,000</i>	105.7	116.3	16.0	12.6
<i>1,000 - 1,999</i>	179.3	128.9	27.1	14.0
<i>2,000 - 2,999</i>	133.3	136.1	20.1	14.7
<i>3,000 - 3,999</i>	86.1	121.3	13.0	13.1
<i>4,000 - 4,999</i>	54.0	95.2	8.2	10.3
<i>5,000 - 5,999</i>	33.5	75.4	5.1	8.2
<i>6,000 - 6,999</i>	21.7	57.5	3.3	6.2
<i>7,000 - 7,999</i>	13.8	42.2	2.1	4.6
<i>8,000 - 8,999</i>	9.5	32.4	1.4	3.5
<i>9,000 - 9,999</i>	6.5	23.4	1.0	2.5
<i>10,000 and over</i>	18.3	94.6	2.8	10.3
Median household income (\$)	2,296	3,607		
Average household income (\$) - nominal	3,076	4,943		
Average household income (\$) - real (base year Nov 1997-Oct 1998=100)	3,610	4,889		

Annual Growth in nominal average household income 1990-2000 : 4.86%

Annual Growth in real average household income 1990-2000: 4.62%

Source: DOS (Singapore Census of Population 2000 advance data release no. 7)

Table 11: Indicators of Resident Population

	Total		Chinese		Malays		Indians		Others	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<i>Labour Force</i>										
Average Monthly Income from Work (S\$)	1,510	3,114	1,582	3,237	1,099	2,040	1,373	3,093	2,113	5,349
Median Monthly Income from Work (S\$)	1,094	2,234	1,139	2,335	954	1,790	1,011	2,167	1,418	3,019
<i>Households and Housing</i>										
Average Household Size (Persons)	4.2	3.7	4.2	3.6	4.7	4.2	4.2	3.7	3.8	3.4
Average Monthly Household Income	3,076	4,943	3,213	5,219	2,246	3,148	2,859	4,556	3,885	7,250
Median Monthly Household Income	2,296	3,607	2,400	3,848	1,880	2,708	2,174	3,387	2,782	4,775

Source: Singapore Department of Statistics. Census of Population 2000.

Table 12: Average household income from work in Singapore

	Average household income from work (S\$)		
	1980	1990	2000
Total	1,228	3,076	4,943
Lowest 10%	95	370	61
Next 10%	348	934	1,145
Next 10%	476	1,321	1,862
Next 10%	597	1,686	2,535
Next 10%	747	2,076	3,237
Next 10%	934	2,541	4,036
Next 10%	1,174	3,116	5,017
Next 10%	1,521	3,897	6,316
Next 10%	2,089	5,152	8,419
Top 10%	4,295	9,671	16,804
Ratio of top 10% to lowest 10%	45.2	26.1	275.5
Ratio top 20% to lowest 20%	14.41	11.37	20.91

Source: DOS (Singapore Census of Population 2000 advance data release no. 7)

Table 13: Number of employed persons aged 15 years and over and gross monthly income in Singapore

	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total	\$3000-\$5999	\$6000 and over
1979	624,083	357,973	25,561	10,711	1,018,328	n.a.	n.a.
1983	341,424	744,080	94,032	43,958	1,223,494	n.a.	n.a.
1985	221,407	813,778	119,058	56,063	1,210,306	n.a.	n.a.
1987	213,384	831,784	135,006	58,595	1,238,769	n.a.	n.a.
1991	162,961	962,708	257,030	125,181	1,507,880	93,454	31,727
1996	136,321	686,336	566,780	358,704	1,748,141	263,365	95,339
1997	123,248	653,899	633,372	419,958	1,830,477	306,669	113,289
1998	133,498	602,808	659,605	473,804	1,869,715	347,559	126,245
1999	145,659	623,074	657,962	459,171	1,885,866	340,217	118,954
2001	186,131	580,846	685,180	594,586	2,046,743	420,246	174,340

Proportion of yearly total

	under \$400	\$400-\$1499	\$1500-\$2999	\$3000 and over	Total	\$3000-\$5999	\$6000 and over
1979	61.3%	35.2%	2.5%	1.1%	100.0%	n.a.	n.a.
1983	27.9%	60.8%	7.7%	3.6%	100.0%	n.a.	n.a.
1985	18.3%	67.2%	9.8%	4.6%	100.0%	n.a.	n.a.
1987	17.2%	67.1%	10.9%	4.7%	100.0%	n.a.	n.a.
1991	10.8%	63.8%	17.0%	8.3%	100.0%	6.2%	2.1%
1996	7.8%	39.3%	32.4%	20.5%	100.0%	15.1%	5.5%
1997	6.7%	35.7%	34.6%	22.9%	100.0%	16.8%	6.2%
1998	7.1%	32.2%	35.3%	25.3%	100.0%	18.6%	6.8%
1999	7.7%	33.0%	34.9%	24.3%	100.0%	18.0%	6.3%
2001	9.1%	28.4%	33.5%	29.1%	100.0%	20.5%	8.5%

Sources: Singapore Ministry of Manpower, Report on the Labour Force Survey 1979, 2001; Profile of Labour Force in Singapore 1983-1994.

Note: Data for 1996-2001 includes contributing family workers

Table 14: Levels of income inequality in Singapore 1966-1999

	Rao and Ramakrishnan (1980)	Rao (1996)	Foo (1998)	DOS (2000)	Tan (1997)	Mukhopadhaya (2001b)
	Gini ratios	Gini Ratios	Gini Ratios	Gini ratios	Theil Index	Gini ratios
1966	0.50	0.50				
1972	0.44	n.a.				
1973	0.46	0.46	0.4845			
1974	0.43	0.44	0.4573		0.165	
1975	0.45	0.45	0.4690		0.176	0.442
1976		0.45	0.4582		0.164	0.433
1977		0.46	0.4744		0.197 (0.165)	0.458
1978		0.42	0.4346		0.163	0.415
1979		0.43	0.4445		0.174	0.429
1980		0.43	0.4384		0.173	0.429
1981		0.43	0.4398		0.181	0.435
1982		0.46	0.4592		0.192	0.460
1983		0.47	0.4712		0.197	0.474
1984		0.47	0.4690		0.189	0.471
1985		0.46	0.4629		0.181	0.465
1986		0.46	0.4576		0.178	0.460
1987		0.46	0.4568		0.182	0.463
1988		0.46	0.4693		0.181	0.464
1989		0.47	0.4702		0.186	0.471
1990		n.a.	0.4237	0.436	0.181	n.a.
1991		0.47	0.4898		0.178	0.471
1992		0.47	0.4792		0.177	0.475
1993		0.47	0.4697		0.183	0.474
1994			0.4875		0.177	0.474
1995			0.4924	0.443		n.a.
1996			0.4929	n.a.		0.473
1997				0.444		0.472
1998				0.446		0.470
1999				0.467		0.476

Sources: Rao and Ramakrishnan (1980)-Table 12; Rao (1996)-Table 18.2; Foo (1998)-Table 4.2; Tan (1997)-Table 4.1.1; Mukhopadhaya (2001b)-Table 8.

Note: Tan (1997) replaced the original calculated Theil index in 1997 which was out of line with the overall trend with 0.165.

Table 15: Decomposition of Theil inequality measure for Singapore

15a

Groups = Educational Attainment

	Between Groups	%	Within Groups	%	Theil inequality measure
1978	0.042	29.0%	0.104	71.0%	0.146
1988	0.061	33.3%	0.122	66.7%	0.183
1997	0.050	32.1%	0.105	67.9%	0.155
1998	0.053	33.9%	0.103	66.1%	0.156
1999	0.051	31.7%	0.110	68.3%	0.161
2001	0.052	34.0%	0.100	66.0%	0.152

15b

Groups = Industry

	Between Groups	%	Within Groups	%	Theil inequality measure
1978	0.003	2.2%	0.143	97.8%	0.146
1988	0.005	3.0%	0.177	97.0%	0.183
1991	0.005	2.8%	0.173	97.2%	0.178
1997	0.005	3.4%	0.150	96.6%	0.155
1998	0.006	3.6%	0.150	96.4%	0.156
1999	0.007	4.2%	0.155	95.8%	0.161
2001	0.008	5.4%	0.144	94.6%	0.152

15c

Groups = Occupation

	Between Groups	%	Within Groups	%	Theil inequality measure
1978	0.044	30.0%	0.102	70.0%	0.146
1988	0.078	42.7%	0.105	57.3%	0.183
1991	0.090	50.2%	0.089	49.8%	0.178
1997	0.073	47.0%	0.082	53.0%	0.155
1998	0.076	49.0%	0.080	51.0%	0.156
1999	0.078	48.3%	0.083	51.7%	0.161
2001	0.076	50.3%	0.075	49.7%	0.152

Table 16: Schedule of tax rates for resident households in Singapore

	Chargeable Income (\$)	<u>1997-2001</u> Rate (%)	<u>2002</u> Rate (%)		Chargeable Income (\$)	<u>2003</u> Rate (%)
<i>On the first</i>	7,500	2	0	<i>On the first</i>	20,000	0
<i>On the next</i>	12,500	5	3	<i>On the next</i>	10,000	4
<i>On the first</i>	20,000			<i>On the first</i>	30,000	
<i>On the next</i>	15,000	8	6	<i>On the next</i>	10,000	6
<i>On the first</i>	35,000			<i>On the first</i>	40,000	
<i>On the next</i>	15,000	12	9	<i>On the next</i>	40,000	9
<i>On the first</i>	50,000			<i>On the first</i>	80,000	
<i>On the next</i>	25,000	16	12	<i>On the next</i>	80,000	15
<i>On the first</i>	75,000			<i>On the first</i>	160,000	
<i>On the next</i>	25,000	20	15	<i>On the next</i>	160,000	19
<i>On the first</i>	100,000			<i>On the first</i>	320,000	
<i>On the next</i>	50,000	22	18	<i>Above</i>	320,000	22
<i>On the first</i>	150,000					
<i>On the next</i>	50,000	23	21			
<i>On the first</i>	200,000					
<i>On the next</i>	200,000	26	24			
<i>On the first</i>	400,000					
<i>Above</i>	400,000	28	26			

Source: Inland Revenue of Singapore, <http://www.iras.gov.sg/TaxInfo/taxrate.htm>

Table 17: Government subsidy rates on education

		Subsidy Rate (%)		
Sector		FY1992	FY1995	Target
Schools				
	Primary	100	100	n.a.
	Secondary	98	98	n.a.
	Junior College	99	99	n.a.
Institutions				
	Vocational	94	97	n.a.
	Polytechnics	83	83	82
	University	79	78	75

Source: Adapted from Report of Cost Review Committee 1996.(original source: Ministry of Education)

Note: The subsidy rate for school fees. Miscellaneous fees are not part of government revenue and hence not included in the computation of subsidy rates on education.

Table 18: Government subsidy rates in Singapore General Hospital (SGH) and government hospitals

Class	Government			SGH			Long term subsidy target
	1987	1990	1992	1987	1990	1992	
A	0	15	13	0	4	0	0
B1	23	44	36	6	19	11*	20
B2	67	73	71	68	73	71	65
C	79	85	84	85	82	80	80

Source: Adapted from Report of Cost Review Committee 1993.(original source: Ministry of Health)

Note: The subsidy rates for Class B1 for SGH is lower than the target rates because previous policy was to achieve full cost recovery for Class B1. With the change in policy to subsidise Class B1 by 20%, the subsidy rate for Class B1 will increase with time.