

Singapore: Economy

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INTRODUCTION

“A wonder created out of a tear drop” is an apt way to describe what Singapore is today compared to what it was just over forty years ago in 1965 when Singapore was thrown out of the Malaysian Federation. The tears that the nation saw in the eyes of the then young leader Lee Kuan Yew solidified the determination of the nation to rise against all odds. The rest is history; Singapore turned its vulnerability to strength.

Singapore’s spectacular ascent from third world to first world status, with no natural resources except its relatively miniscule population size and the excellent geographical location, is unprecedented. In terms of annual real per capita income, measured in purchasing power parity terms at 2000 constant prices, Singapore and Switzerland were at par with about \$30,000 in 2004. This stands in stark contrast to the situation in 1965, about \$4,500 in Singapore as opposed to about \$18,000 in Switzerland (Penn World Table Version 6.2). Even in terms of other development indicators, Singapore’s progress since 1965 is unsurpassed. Infant mortality rate that stood above 26 per 1000 live births in 1965 dropped to 2 and 2.5 in 2005 and 2006 respectively, among the lowest in the world. Over the same period the proportion of people living in and owning publicly provided housing units increased from 4% to 85%, the adult literacy rate improved from 73% to 95%, the labor force with secondary education went up from 14% to 50%, the labor force with tertiary education went up from 2% to 35% and life expectancy at birth improved from 66 to 80 years (www.singstat.gov.sg).

Singapore’s founding leader, Lee Kuan Yew, is often asked the question by foreign observers “what was the secret of Singapore’s success?” His answer to this question has been “there was no secret; we had no choice but to take a chance and sale into rough waters”. Government’s development ideology has been growth-driven, purely pragmatic and adaptable to changing circumstances. As a result a uniquely Singapore system has emerged that may not be easily emulated by others. On the one hand, Singapore is a tightly regulated planned economy and on the other hand it stands out as a beacon of the free market system. The pioneering economic architect of Singapore, Goh Keng Swee, described Singapore as “a socialist economy that works”. The present day Singapore may be described as a “market-driven guided economy”.

Singapore is not without its critiques. The contention arises primarily with regard to the lack of political freedom and the heavy weight approach that the Government has adopted in handling political opponents and dissenting views. Referring to this scenario in a light-hearted manner a prominent economist in the country likened Singapore to a “sampan” (the Malay word for a small boat) that has to be maneuvered through rough waters; if a few monkeys are allowed to jump around, the sampan will capsize and sink. Racial riots, violent politics and bloodsheds in the newly independent countries such as India and Sri Lanka and Singapore’s own turbulent beginnings taught the Singapore

leaders the importance of political stability for economic progress. In the words of Goh Keng Swee, “The role of government is pivotal. Non-economic factors, which have yet to be reduced to a coherent multi-disciplinary system, are more important than economic variables.” The Nobel laureate Amartya Sen echoed these views by arguing that good governance, not less governance, is the key to addressing the challenges of economic inequality, environmental degradation and terrorism (Speech delivered at the LKY School of Public Policy of the National University of Singapore).

After a brief account of Singapore’s recent growth record the rest of this write-up will focus on the key ingredients of Singapore’s success story. In a typical production function analysis the focus is laid on factor inputs mainly labor and capital. In an economy like Singapore which is driven primarily by international investments, capital is essentially an intermediate input and what makes Singapore attractive to this capital are the key ingredients that need to be examined. These ingredients can be captured in three broad categories, manpower, infrastructure and international competitiveness. Going further, the composition of these ingredients is a product of government policies. These will be discussed in the ensuing sections. This brief account of the Singapore economy draws heavily upon author’s own research and writings and that of many others without making a direct acknowledgement in the text. The key references are provided in the bibliography.

RECENT GROWTH RECORD

After the successful take off by mid 1970s and except for falling into a deep air pocket in 1985/86 the Singapore economy recorded an impressive growth passage till the onset of the Asian Financial Crisis in mid 1997. Following the crisis came the electronics dip in 2001 followed by the SARS set back in 2003. Despite the rather gloomy atmosphere then the economy gathered steam quickly and started to accelerate by recording 8.8% growth rate in 2004 followed by a 6.6% in 2005 and 7.9% in 2006.

In terms sectoral performance, the manufacturing sector, as in the past, was the main driver of the accelerated growth; the sector grew by 11.5% in 2006 and contributed about 3 percentage points to the overall growth rate. The manufacturing sector has retained its dominance in the economy by contributing 27% to GDP in 2006. After a long period of stagnation, the construction sector started to pick up and grew by 2.7% in 2006 and contributed about 3% to GDP. The service sectors jointly accounted for about 63% of GDP in 2006 or 4.4 percentage points in the GDP growth rate. Overall, therefore, the growth was broad-based.

On the demand side, private consumption expenditure grew modestly by 2.5% in 2006. A puzzling scenario that has been unfolding in Singapore is that the private consumption expenditure share in GDP has been falling over the years. This share has fallen from 61% in 1970 to 40% in 2006. In general, private consumption expenditure is the most stable aggregate demand component and accounts for about two thirds of GDP in developed economics. As this built-in stabilizer gets eroded away, the economy’s growth path

becomes more volatile because of the volatility of the other demand components, private investment expenditure and exports. Studies show that Singapore's falling consumption share has resulted primarily from rising property and car prices; when these prices fall the consumption share tends to rise.

The total domestic demand recorded a healthy 6.6% growth in 2006 mainly because of a healthy growth of private investment expenditures propelled a healthy inflow of FDI. More than 80% of net investment commitments in manufacturing are from foreign investors. In 2006, the manufacturing sector attracted S\$8.8 billion worth net investment commitments, most of which were from EU, US, and Japanese investors.

The propeller of the Singapore economy has been the external demand; export of goods and services. In 2006 external demand grew by 10.4% and contributed 8.1 percentage points to the year's GDP growth. In comparison, the total domestic demand contributed only 1.5 percentage points to the growth rate. The role of exports is well reflected in the exports to GDP ratio. In 2006 the merchandise exports to GDP ratio stood above 200% and the domestic merchandise exports (excluding re-exports) to GDP ratio stood above 100%. The major value adding export item is non-oil domestic (merchandise) exports (NODX), which accounted for 40% of total exports in 2005/06. A healthy trade balance outweighed negative service and capital/financial balances to yield a S\$26 billion surplus which amounted to 12% of GDP in 2006. Singapore has enjoyed persistent balance of payments surpluses over many decades.

With the impressive recovery of the economy the labour market made substantial gains. In 2006, a record number of 173,300 new jobs were created and as a result the unemployment rate fell further to 2.7% from a height of 4.0% in 2003. Service producing industries took the lion's share by creating 110,700 new jobs followed by the manufacturing and construction sectors creating 62,600 and 40,900 new jobs respectively.

Despite the overall high growth the nominal wages grew only by 3.2% and real wages by mere 2.2%. The highest growth in nominal wages occurred in the real estate and leasing services (11.7% growth) followed by financial services 5.7%. The slow growth in nominal wages kept cost pressures down; in 2006 the economy wide unit labour cost index fell by 0.5% and the unit business cost index in manufacturing edged up slightly by 0.6%.

The first half of 2007 recorded a boom and frenzy. Propelled by the high growth performance, the property market awakened from a decade long slumber and re-entered a frenzy fuelling a bubble similar to that burst in 1996. Burgeoning tourism sector with 9.7 million visitors in 2006 and with another 5 million in the first half of 2007 has squeezed the hotel sector with visitors spilling over to many non-standard visiting lodges. Outbound travel faced a crunch as a result of demand outstripping the supply and created long waiting lists for flight bookings. The upbeat, however, rekindled the fears of a roller coaster ride for the Singapore economy.

DEVELOPMENT STRATEGY

Development Experience and Institutions

Since self-government in 1959 and independence in 1965, Singapore has passed through a number of phases in its development process. The Government put in place strategic plans in 1960 (First Plan), 1980 (Second Plan), 1985 (Economic Committee Report), 1991 (Strategic Economic Plan), 1998 (Competitiveness Report), 1999 (Industry 21; Manpower 21), and 2002 (Economic Review Committee). Through a forward looking strategy the government of Singapore has responded to new economic challenges quickly and capitalized very well on the “first-mover” advantages.

Despite the current standing as a developed economy, the initial challenges that Singapore had to face were many. Although independent Singapore inherited an efficient entrepot trade system from its colonial masters, it also inherited a large pool of unemployed workers (with more than 10% of the labor force was unemployed in 1960), a low skilled workforce, and wretched housing conditions. The institutional structure that the Government put in place to address these issues, though evolved over time, continues to this day. The Government took initiatives to tackle these problems simultaneously. The education policy was geared towards training in skills that were needed for the emerging industries. The Housing Development Board (HDB) was set up in 1960 to provide adequate public housing at subsidized rates. The Economic Development Board (EDB) was set up in 1960 to spearhead the industrialization drive.

A major challenge for the Government was to transform Singapore from a re-export economy under the colonial regime to an export economy. This appeared to be an insurmountable task for three reasons. First, unlike Hong Kong and Taiwan, which benefited from an exodus of entrepreneurs from communist China to their shores, Singapore faced a severe dearth of industrial entrepreneurs (as opposed to commercial entrepreneurs) at the early stages of its industrialization. Second, the lack of domestic savings aggravated the situation further. Third, the regional markets for Singapore’s exports were not that viable because they were likely to impose trade barriers to help their own industries. This meant that Singapore had to look beyond the regional market.

The solution to these problems was to aggressively look for foreign direct investment (FDI) from the industrial world to build up the manufacturing base of Singapore. The foreign companies not only brought in investment and entrepreneurship they also brought with them the markets for their products. The Government made sure to make Singapore as attractive as possible for foreign investors by providing them not only with financial incentives such as tax breaks and accelerated depreciation allowances but also with a cordial labor force. This latter objective was achieved by diluting the power of militant labor unions and establishing the National Trade Union Congress (NTUC) that worked cooperatively with the Government and employers. The Government also mobilized domestic savings through the compulsory savings scheme under the Central Provident

Fund (CPF), which the colonial administration started in 1955 initially for civil servants. The basic structure thus laid down has continued to this day.

A number of institutions have played a very important role in transforming the Singapore economy. Apart from spearheading Singapore's industrialization drive by attracting FDI, the EDB also engaged in developing the local entrepreneurship and since the 1990s in promoting Singapore's regionalization drive. The NTUC is also a multi-tasking institution. Apart from its key role mentioned earlier, it also runs a grocery chain, a taxi service and insurance service. As a virtual branch of the Government, the NTUC services have acquired public trust. In 2002 International Enterprise Singapore (IE Singapore) was set up by expanding the role of former Trade Development Board (set up in 1983) to promote trade and internationalization of Singapore-based companies. The Urban Redevelopment Authority (URA), set up in 1974, is the key institution that makes plans (under its 10-year Concept Plan) for land usage. Under a land acquisition act, the Government acquired private land at low prices. The government ownership of land increased from 44% in 1960 to 85% in 2000. The National Wages Council (NWC) set up in 1972 brings together the Government, employers and trade unions to set wage guidelines. In addition to many statutory boards there are government holding companies and a large number of government-linked companies (GLCs) that play key roles in Singapore.

Branching Off

One important element of Singapore's development strategy has been historical continuity and branching off. A serious mistake a number of newly independent countries made was to either cut off or weaken the colonial economic pipeline, and as a result fall into economic degradation. In the industrialization process Singapore did not break away from the entrepot trade system that it inherited from its colonial masters. In fact, entrepot trade still plays a very important role in Singapore. The value of re-exports has ballooned from S\$3.3 billion in 1960 to S\$204.2 billion in 2006. What has changed is the relative importance of entrepot trade in the economy. As a share of total exports, re-exports accounted for only 47% in 2006 as opposed to 94% in 1960. The country evolved rapidly from a re-export economy to a manufactured export economy.

Even within manufacturing, further branching off from electronics to other areas like chemicals and biomedical manufacturing (especially pharmaceuticals) has been taking place over the decade after the Asian Financial Crisis. In 2006 electronics accounted for 29% of manufacturing value added as opposed to more than 50% in 1995. With the emergence of chemicals and biomedical manufacturing also as key players with 14% and 25% of value added shares respectively in 2006, the manufacturing sector has become more broad based. Unlike the electronics production, chemicals and biomedical production are highly capital and skill intensive. In terms of employment in manufacturing in 2006 electronics absorbed 26% of the manufacturing workers whereas chemicals and biomedical sectors absorbed only 9%. For these sectors the Government

has made heavy infrastructure investments in Biopolis and the Tuas Biomedical Park. These heavy investments are a calculated gamble that the Government decided to bid on.

With rising competition for manufacturing from low cost competitors, the Singapore Government embarked on a further branching off to new economic drivers; one among them was to develop an “external wing” and another was to develop Singapore as a regional service-hub. While both these were emerging as natural outcomes of Singapore’s development process, the former received special government attention in the early 1990s and the latter since about 2000.

Under the regionalization drive, the Government designed an incentive package for Singapore companies to invest in the region and beyond. Direct investment is an effective way to penetrate protected markets. The emerging transition economies such as China, Viet Nam, and Cambodia provided more opportunities for such investment. Outside Asia, countries like Mexico and Central and East European countries were also emphasized because of their proximity to the USA and the EU. Private companies as well as Government Link Companies (GLCs), with the support of such institutions as the EDB, were encouraged to take advantages of these opportunities. The EDB also arranges training schemes for managers under its Initiatives in New Technology (Rationalization) Programme. At the end of 2005 Singapore’s direct equity investment abroad amounted to about S\$154 billion, a substantial jump over the 1990 level of S\$13.6 billion. Over this period equity investment has grown by more than 20% per year with the exception of 1998 when there was a contraction as a result of the Asian Financial Crisis. The total direct investment that includes net lending to overseas affiliates amounted to S\$181 billion in 2005 of which S\$25 billion went to China and another 15 billion to Malaysia. In terms of returns the factor income of Singapore’s from the rest of the world was about 11% of GDP in 2003 and 2004. Obviously, these returns were miniscule in relation to what accrues to foreign residents and institutions in Singapore. As a result Singapore’s GDP remains higher than the GNP.

Under the service-hub drive, Singapore is aiming at moving into non-traditional service areas as quickly as possible because the traditional areas such as aviation, logistics, finance and tourism are also facing intense competition from its regional competitors. For example, Singapore’s attraction to tourists primarily lies in its aviation hub status, a stop-over for many tourists who are on the way to more popular tourist destinations in the region. There is a strong correlation between tourism in the region and in Singapore. Moreover, the average length of stay for tourists in Singapore is only about three days as opposed to about two weeks in Thailand. As these competitors improve their aviation services and coupled with their relatively cheap retail shopping Singapore may lose a large proportion of its “stop-over” tourists. As for financial services, Shanghai is trying to capture a large chunk of the pie. The major obstacle to Shanghai in this regard is its serious pollution problem. As for port services, Malaysia’s Tanjung Pelapas port made Singapore rethink its approach to managing the port.

As with the manufacturing sector, the intense competition in the traditional service sector has prompted Singapore to move into non-traditional services quickly before the

competitors catch up. Capitalizing on Singapore's English speaking environment, the Government has focused on developing two key areas; on making Singapore a "global schoolhouse" and on developing Singapore as a medical hub for various treatments. As a learning center in the region the Government is planning to attract at least 150,000 international students by 2015 (The Straits Times, March 24, 2007). The country is in fact well on the way to achieving or even surpassing this target. In 2006 Singapore hosted nearly 80, 000 international students. This was a 46% increase over the 2003 figure. Students came from more than 120 countries but the majority was from China, which now has overtaken the traditional sources, Malaysia and Indonesia. This sector's contribution to the economy was about 3.8% of GDP or about S\$8 billion in 2006. The Government's aim is to increase this to 5% of GDP by 2015. The Government launched the roadmap for this endeavor in 2002 as recommended by the Economic Review Committee to tap on Singapore's English speaking advantage, high education standards, cosmopolitan character, global connectivity, safe environment, and multi-lingual society. About 20 reputed foreign academic institutions have been operating in Singapore in early 2007 and the Singapore Tourism Board (STB) has been holding road-shows in many cities to promote Singapore both for tourism and other services.

As for the medical-hub drive, the Government aims to attract about one million foreign patients to Singapore for treatments by 2012 (The Straits Times, March 24, 2007). The record so far has been quite impressive. Unofficial figures indicate that more than 400,000 foreign patients were on shore in 2006, about 20% growth per year. With one million patients it is estimated that an injection of extra S\$3 billion to the economy with additional 13,000 new jobs created. While the Singhealth cluster of hospitals (Singapore General Hospital, Changi General Hospital and KK Women's and Children Hospital) and National Healthcare Group (NHG – Tan Tock Seng Hospital, Alexandra Hospital and National University Hospital) provide subsidized care to Singaporeans, the private outfits like Parkway Holdings (East Shore, Gleneagles and Mount Elizabeth) and Raffles Medical Group cater primarily to non-subsidized patients that includes foreign patients. Apart from traditional regional markets, the Government's aim is also to tap the American market where the healthcare costs are skyrocketing. For example, a heart bypass that may cost more than US\$130,000 in the US costs about US\$18,500 in Singapore. The medical services got a further boost after the Singapore Medical Association removed fee guidelines in early 2007 in response to a call for promoting competition by the Competition Commission of Singapore (CCS), which was set up in 2005.

A third and a controversial service area that the Government ventured into was the Casino endeavor. Construction works is under way to set up two integrated resorts (IRs), one in Marina Bay the other in the Sentosa island. The undertaker of the former project, the Las Vegas Sands Corporation, has committed S\$3.85 billion in development expenditure and the total investment is expected to exceed S\$5 billion. This project is expected to add another S\$2.7 billion annually to GDP (about 0.8% of GDP) and create 30,000 new jobs by 2015. The undertaker of the second project is Genting International and Star Cruises. The investment expenditure and expected return of the project are similar to the first one. The Singapore Government finally nodding to casinos is seen as

an outcome of running out of choices in the face of increasing competition in the region for its established industries.

R&D Thrust

Another front in which Singapore is trying to push ahead is research and development and thereby moving into the creation of a knowledge-based economy. Recognizing the importance of an innovation-driven growth strategy the Government put together the first five-year National Technology Plan in 1991 and allocated S\$2 billion for infrastructure development, R&D efforts and for training the needed manpower in nine areas namely, information technology and telecommunications, microelectronics and semiconductors, electronic systems, manufacturing technology, materials and chemicals technology, environmental technology, energy water and resources, biotechnology, food and agro technology, and medical science. A second (1996-2000) and a third (2001-2005) five year plan of Science and Technology followed suit and the Government made further commitments to deepen the R&D effort. Under the Technopreneurship 21 (T21) initiative the Government further formalized and liberalized the business regulations to encourage entrepreneurship.

Further, in 2000 the Agency for Science and Technology (A*STAR) was created by reorganizing the National Science and Technology Board. The Government has been setting aside substantial and increasing amounts of funds for fundamental research and innovations, promoting entrepreneurship and attracting foreign talents. As of 2005 the gross R&D expenditure as a percentage of GDP stood at 2.4%. In this regard Singapore still falls behind bigger players like Japan (3.1%), South Korea (2.9%) and the US (2.7%) and even the small economies like Israel (4.7%), Sweden (4.0%), Finland (3.5%), Switzerland and Taiwan (2.9% each) and Denmark (2.5%). In the 2007 Budget the Singapore Government committed to increase the R&D expenditure to 3% of GDP. In 2006 the Government set up a high-powered National Research Fund.

Given the long-term nature of these investments it is difficult to measure their impact on the economy directly. Nevertheless, indirect indicators show that Singapore is progressing rapidly on the R&D front. In terms of manpower, the full-time equivalent (FTE) number of researchers in Singapore rose by more than 11% in 2005 to reach 23,789. This is more than 90 researchers per 10,000 workers compared to less than 30 in 1990. Even in terms patenting activities Singapore recorded substantial improvements with a record 46% increase in patents awarded in 2005. Obviously all these are essentially input indicators of the R&D drive and the value added needs to be measured indirectly.

EDUCATION AND MANPOWER

Harnessing manpower for industrial needs has played a central role in Singapore's economic progress. Singapore's education policy and manpower policy are intertwined.

The experience of countries like Sri Lanka, where unemployment among the educated youth was a breeding ground for communists, taught the Government the importance of targeted education. In the words of Goh Keng Swee, “For nothing is more likely to produce political instability than an increase in the number of such [educated] people.”

The evolution of the education policy can roughly be grouped into three periods, the early industrialization phase, post-1979 industrial re-structuring phase, and the post-Asian crisis phase of knowledge-driven economy. During the early phase, the emphasis was on providing sufficient vocational and technical training and discipline to meet the manpower needs of the new industries and to maintain industrial peace. To tackle the massive unemployment problem the Government also adopted an anti-natalist policy during this period. Well known as the “stop at two policy” this involved many disincentives to going beyond two children per family. Unfortunately, further propelled by rapid industrialization and education, the anti-natalist policy over-shot its target of zero population growth too early, by 1977 the total fertility rate (TFR) had fallen to 1.8, a level below the replacement level. The labour-surplus economy turned into a labour-short one with the average unemployment rate falling to about 2% over the decade before the onset of the Asian Financial Crisis.

The second and third phases of industrial re-structuring towards high-value added production and services went on with educational reforms. The Government set up the Council for Professional and Technical Education in 1979. Making manpower projections and recommendations were among the main tasks of the Council. Educational wastage was another important issue that the Government addressed at this time. In the late 1970s, the attrition rate was 29% for the primary level and 36% for the secondary level students. To reduce these numbers the Government introduced streaming of students in 1980 with an allowance for lateral transfers between streams. Although streaming created some unhappiness among parents, it led to a substantial increase in the pass rates at national examinations. The pass rate at the Primary School Leaving Examination (PSLE) went up steadily from 83.3% in 1980 to 88.2% in 1990 to 97.7% in 2006. The pass rate at General Certificate of Education (Ordinary Level) also went up from 68.6% in 1980 to 88.9% in 1990 and then came down to about 82% between 2003 and 2006. Over the same period the pass rate at GCE (Advanced Level) went up from 67.9% in 1980 to 76.5% in 1990 to about 91% between 2003 and 2006..

To address the labour shortage problem, since 1980 the Government has adopted a pro-natalist and pro-immigration policy. The incentives for procreation beyond two children were provided on a selective basis; the emphasis was on high-income well educated families to procreate more and to keep the family size small for low-income less educated families. In August 2000 the Government introduced a further incentive known as “baby bonus” to encourage procreation. This involves setting up of a Children Development Account to which the Government deposits S\$1,500 for a second child or S\$3,000 for the third child until the child reached six years of age. In addition, for every dollar placed in the account by the parents, the Government would make a matching dollar-for-dollar contribution of up to S\$1,000 for a year for the second child and up to S\$2,000 for the third child. Parents can decide freely how to use the funds. In August 2004 the

Government announced an additional incentive payment of S\$10,000 on the birth of a couple's third and fourth child. Despite all these incentives the pro-natalist policy recorded little success. With a TFR of 1.26 in 2006 Singapore is among the lowest TFR countries in the world. As with other developed nations, this paradoxical (non-Malthusian) opposite movement of family income and family size is partly a result of rising time cost of children for educated mothers. Even with the provision of low-cost childcare facilities and tax rebates on maid services, the non-reversal of the declining fertility trend is attributable, as espoused by Richard Easterlin, to rising material aspiration levels outpacing the growing family income.

Given the difficulty of raising fertility levels, the Government had no option other than to rely on imported labour to meet the needs of the expanding industries. In the 1970s the main source of foreign workers, except for professionals, was Malaysia. Subsequently the Government had to open the door for other countries like Thailand, Indonesia, the Philippines, and the Indian sub-continent. Although data on foreign workers are not available from public sources, substantial growth of total employment beyond the growth of resident population indicates the extent of the use of foreign workers in the Singapore economy. During the boom years of the 1990s, for example, total employment grew by more than 6% per year while the resident population (Singapore citizens and permanent residents) increased by less than 2%. In 2006, the total labour force was 2.56 million of which about 756,000 (or about 30%) were foreigners. The foreign labour force plays a dual role in the Singapore economy, one is to meet the shortfall in the resident labour force and the other is to keep the wages at a competitive level. The Government uses the foreign worker flow as a controlling mechanism on wages. Foreign worker levy is also an important source of revenue for the government.

Looking ahead, the Government in early 2007 set a target population for Singapore of 6.5 million by 2050. In the 1970s the emphasis was on reaching a population target of 3.2 million by 2030. Subsequently in the 1990s the Government revised the target to 4.3 million and then in 2001, this was raised to 5.5 million and then again to 6.5 million. This means, given the current population size of 4.5 million and if Singapore's current TFR remains constant at 1.3, by 2050 40% of Singapore's population will comprise of new immigrants. This also means that Singaporeans have to bear with an increasing population density; more than 9000 people per sq km by 2050 compared to the already dense 6369 per sq km in 2006. If the tourist arrivals continue to increase further beyond the nine million in 2006, the population density in the business district may increase to uncomfortable levels.

INFRASTRUCTURE

A key pillar of Singapore's impressive growth record was its infrastructure, a factor that often gets neglected in standard growth accounting exercises. The high quality physical infrastructure combined with a highly efficient services framework and political stability provided Singapore an edge over its competitors in attracting FDI despite its cost disadvantages. Providing physical infrastructure alone will not define its quality, the

efficient use of it also matters. The super efficiency of Singapore's Changi International Airport is a prime example in this regard. Another exemplary case is Singapore's methods of managing its vehicle population without letting the traffic clog the road network. These cases highlight how simple growth accounting techniques can produce highly misleading conclusions as seen in a number of total factor productivity (TFP) computations.

Singapore is one of the most efficient economies in the world. With its push for an innovation driven economy, Singapore has been building up another type of infrastructure to make the country attractive for innovative activities. Some have come to differentiate between these two types of infrastructures by categorizing them as "efficiency infrastructure" and "innovation infrastructure". The latter requires facilities and the legal framework for R&D and a conducive environment for creative work. Obviously, except for conceptual clarity, these two are inseparable entities.

Efficient use of land is of paramount importance to the tiny island that has grown in size, through land reclamations, from 581.5 sq km in 1960 to 704.4 sq km in 2007. The Changi International Airport sits on reclaimed land. Jurong Island which houses petrochemical industries was created by combining seven small islands. As stated earlier the Government owns more than 85% of the land and the Urban Redevelopment Authority through its Concept Plan and Master Plan makes projections on the future use of land and allocates the land accordingly.

Upgrading of public housing, road and rail network and port facilities are regular features in Singapore's infrastructure development. In particular, the Changi International Airport has gone through a major upgrading exercise in 2006. The new Terminal 3 is expected to be ready by early 2008 and that will increase the airport's handling capacity by another 20 million passengers, to a total capacity of 67 million passengers annually. In the 2007 Budget the Government has made further plans to improve Singapore's living environment to make it a garden city with many waterways; a green and blue city.

The innovation infrastructure mentioned above requires amenities that can foster creative minds. In this regard the Government is committed to taking a holistic approach in infrastructure development that involves harnessing the synergy between scientific research and a creative atmosphere. Science parks and amenities for cultural and artistic work are springing up. The One North project is a big step in this direction to create a scientific-cultural hub. One North, signifying Singapore's location in the World (one degree north of the equator), is a three-phased mega project that the Government is planning to complete within about twenty years (for more details see <http://www.one-north.sg/>). The Esplanade - Theater on the Bay is a world-class theater and a landmark opened in November 2002 to build up the creative atmosphere of the city.

A downside to these infrastructure developments is that they are erected by demolishing existing structures that are perfectly in good condition. This is a result of limited land area that Singapore is constrained with. Nevertheless, from a global perspective, this involves a substantial waste of resources and environmental costs.

INTERNATIONAL COMPETITIVENESS

Maintaining international competitiveness has always been a priority concern of policy makers because Singapore's sustained growth depends critically on international factor inflows and external trade. The Government has been addressing this at two levels; one is by containing cost pressures during downturns and the other is through long run productivity improvements.

The Government's approach to addressing the short-run cost competitiveness has been both direct and indirect. As will be discussed in the next section, the exchange rate policy is geared towards containing imported inflation. A key policy tool that the Government has used in direct interventions is the adjustments to the CPF contribution rates. To combat the 1985/86 recession the Government slashed the employer's CPF contribution rate from 25% to 10% and retained the employee's contribution rate at 25%. As the economy gained its growth momentum the employer's rate was adjusted steadily upward and the employee's rate was adjusted downward to reach 20% each by 1994. In response to the Asian Financial Crisis the Government again cut the employer's rate to 10% in 1999. This was later restored to 16% but cut again to 13% after the SARS episode. In July 2007 this rate went up to 14.5% again. The cost cutting packages included many other measures such as cutting the utility rates and tax rebates to companies.

The Government intervenes indirectly to reduce wage pressures by controlling the inflow of foreign workers. Apart from this, a unique institutional feature that Singapore has put in place to make wages flexible downward is to attach a variable component to the wage package. The variable component can go up and down depending on the performance of the company and the economy. On taking the cue from the public sector many private companies have adopted this adjustable wage system.

Gaining long run competitiveness through productivity improvements is a challenge that the Government has been trying to address since early 1980s. Education and skill developments and restructuring the economy towards high value added industries have taken priority in recent years. The R&D thrust discussed earlier is a concerted effort in productivity improvements. When labour productivity is measured as value added per worker Singapore's productivity growth rate has been impressive with the exception of the turbulent period between 1997 and 2004. Overall the growth rate of GDP per worker has been about 4% per year since 1980. However, the value added per worker overstates the productivity gains since Singapore (and East Asian) workers tend to work longer hours compared to the OECD counterparts. In the absence of quality data on hours worked it is difficult to assess these productivity trends. Nevertheless, recent data published by the Department of Statistics show that value added per manhour has grown by about 3% per year between 2000 and 2006.

MONETARY SYSTEM AND POLICY

In June 1967, nearly two years after independence, Singapore broke away from the currency union with Malaysia and Brunei and established its own currency board (Board of Commissioners of Currency, Singapore – BCCS) and issued its own currency, the Singapore dollar. Until 1973 the Malaysian ringgit, Brunei dollar and Singapore dollar were interchangeable at par. In June 1973, when Singapore dollar was floated, it was delinked from the Malaysian ringgit but remained exchangeable at par against the Brunei dollar. Until the BCCS was merged with the Monetary Authority of Singapore (MAS) in October 2002 the BCCS was the issuer of the Singapore dollar. The MAS, which was established in 1971, is Singapore's *de facto* central bank and the regulator of the banking and financial institutions. In 1981 the Government of Singapore Investment Corporation (GIC) was established to manage and invest long-term government reserve assets, a function that MAS handled earlier.

Singapore is among the top ten most sophisticated financial markets in the world. Over the years, MAS liberalized its rules and regulations on the financial market enabling it to capture an increasing proportion of world's financial transactions. Except for prudent regulation of the banking and financial system and money market operations for maintaining liquidity in the financial system the MAS does not engage in controlling the interest rates or the money supply. The main monetary policy instrument that the MAS uses is the exchange rate to control imported inflation.

Interest rates in Singapore closely follow the US rates and the money supply fluctuates in response to demand. With the tightening of the US monetary policy in 2006 the 3-month US\$ SIBOR rose steadily to reach 5.36% by the end of the year. The domestic 3-month interbank rate followed this trend closely and settled to 3.44% by the end of the year. The longer term interest rates also followed a similar trend; the benchmark 10-year Singapore Government Securities (SGS) rate settled to 3.04 by the end of 2006. The retail interest rates, on the other hand, remained very stable with the average prime lending rate at 5.33% and the deposit rates below 1%. With 1% price inflation, the real interest rates on deposits were negative.

Exchange Rate and Inflation

Although Singapore has adopted a managed float for the exchange rate, studies show that changes in the US dollar tend to determine the Singapore dollar the most. The US dollar receives a weight of about 0.6 with the remainder is largely taken up by the Euro followed the Yen. The MAS policy towards the exchange rate since 1981 has been to allow it to appreciate sufficiently to combat imported inflation. Singapore has enjoyed a persistent balance of payments surplus and the resultant excess demand for the Singapore dollar has set the exchange rate on an appreciating path.

The MAS regulates the exchange rate by allowing it to fluctuate within an undisclosed band set against a trade-weighted nominal effective exchange rate (NEER). In general,

however, the MAS policy has been to stabilize the fluctuations of the exchange rate and allow the market determine the trend. During the Asian Financial Crisis the MAS widened the band and allowed the exchange rate to depreciate substantially. The powerful tool that the MAS uses to keep the exchange rate within the band is the foreign exchange reserves accumulated over the years. By the end of 2006 Singapore's official foreign reserves stood at S\$211 billion; about 100% of GDP and seven months of imports. Singapore is one of the top foreign reserve hoarders in Asia. With this reserve position and given the long-standing policy of discouraging the internationalization of the Singapore dollar, the MAS can inflict losses on speculators quickly through interventions in the foreign exchange market. (Note that the non-internationalization rules were relaxed over the years.) Market interventions are carried out by buying and selling US dollars against the Singapore dollar. Foreign exchange swaps are the main mechanism that the MAS uses to sterilize the effect of foreign reserve accumulations on the domestic money supply. Excess domestic savings accumulated through CPF savings and government savings also work as a built-in sterilizer. Despite persistent balance of payment surpluses and the accumulation of foreign reserves Singapore's monetary base has remained very much delinked from foreign reserves.

In the early 1980s the Singapore dollar rate against the US dollar was about S\$2 to a US dollar. Before the onset of the Asian Financial Crisis the Singapore dollar had appreciated to about S\$1.40/US\$. Following the Crisis the Singapore dollar depreciated to reach more than S\$1.80/US\$ in 2001 and then assumed an appreciating path again. By July 2007 the Singapore dollar had appreciated to about 1.50/US\$. Although the Singapore dollar appreciated against the US dollar and the US dollar pegged currencies it weakened against some others like the Euro, Pound Sterling, and Australian dollar.

There are two points worth emphasizing with regard to the impact of the exchange rate on export competitiveness. First, because of the high import content in merchandise exports and given that Singapore is a price-taker in the world market the appreciating Singapore dollar does not affect the merchandise exports much. However, the currency appreciation hurts service exports since the cushioning effect of import content is low in them. Nevertheless, the professed policy of the MAS has been that it is better to enhance export competitiveness through reduced business costs and improved productivity than through exchange rate depreciations. Second, on a longer term basis the real exchange rate (REER) has remained stable without eroding Singapore's export competitiveness much.

Given that Singapore uses other instruments to improve export competitiveness the MAS has used the exchange rate mainly to reduce imported inflation. A key determinant of Singapore's CPI inflation is import prices. Exchange rate fluctuations get transmitted fully into domestic prices of imports within about a year depending on the import category. Although domestic prices of imports have fallen in general, the CPI has edged upward over the years reflecting the important role played by non-traded goods and services in the determination of the domestic inflation rate. Despite the cost pressures due to the economic boom since 2004 the CPI inflation rate remained subdued, 0.5% in 2005 and 1.0% in 2006.

FISCAL POLICY

The pivotal role the public sector has played in Singapore's transformation is well acknowledged. Despite such heavy involvements, based on the philosophy of fiscal prudence, the Singapore Government has kept both government revenue and expenditure at relatively low levels (around 15% of GDP) and yet generated healthy and persistent budget surpluses. On the revenue side, however, the Government has adopted an unconventional accounting method by excluding two items, receipts from the sale of land and capital goods and the net investment income generated by investing government reserves. Only up to 50% of the latter is included in the budget. If these items are taken into account, the actual budget surplus would be much larger than the reported one. For example, in 2005 the reported budget surplus was S\$0.43 billion whereas the actual surplus would have been as high as S\$10 billion. Although the reported surplus has varied from -2 to 8 percent of GDP over 1990-2005 the adjusted surplus remained positive and varied from 3 to 19 percent of GDP. These surpluses have yielded a robust fiscal position for Singapore with total public assets standing at \$437 billion by the end of March 2005.

Tax Policy

In general, the fiscal measures have been pro-business. The corporate tax rate has come down steadily from 40% prior to 1986 to 20% in 2005. Faced with competitive pressures from economies like Hong Kong where the corporate tax rate as of 2007 was 17.5% and other emerging economies with even lower rates, the Singapore Government announced a further reduction of its corporate tax rate to 18% to be effective from the fiscal year 2008. Business firms also receive many other incentives such as investment tax credits, accelerated depreciation allowances and firm specific benefits that would reduce their tax burden substantially.

The Government also reduced the personal marginal income tax rate steadily over the years to enhance work effort. The highest marginal income tax rate in 1980 was 55% for assessed income exceeding S\$600,000. In 2007 this was 20% for assessed income exceeding S\$320,000. The income-share weighted average marginal income tax rate has come down from about 10% in 1980 to about 6% by 2007. Effectively, an average Singapore worker pays very little income tax compared to the OECD counterparts. Obviously this blurs the picture since there are many other tax and non-tax charges including the goods and services tax (GST) that would add up to a much higher effective tax rate. Moreover, Singapore does not have a social welfare network similar to that of many OECD countries and only recently has the Government come to address this issue openly.

Corporate income tax constituted the largest revenue item in 2006 accounting for 27.5% of the total revenue followed by personal income tax with 15.6% and GST with 13.0%.

The remaining 43.8% was generated from other tax and non-tax charges. On the personal income tax side, there are rebates and deductions, the largest deduction being the CPF contributions. Moreover, only about a third of the labor force pays income taxes. Therefore, to offset the reduction in income tax revenue resulting from reduced corporate and personal income tax rates the Government has been raising the GST from time to time. The GST was introduced in April 1994 and the initial rate was 3%. Then it went up to 4% and 5%. In July 2007 the GST rate went up from 5% to 7%. Eventually the GST may come to prominence as a major source of government revenue.

Among other revenue items, two are somewhat unique to Singapore. One is the foreign worker levy (introduced in 1980) that the Government uses to regulate the inflow of low-skilled foreign workers and thereby the market wage rate. The employer has to pay the levy to the Government when they employ low-skilled workers (see www.mom.gov.sg for more details). The other revenue item is motor vehicle taxes that the Government uses to regulate the vehicle population in Singapore. This involves taxes and charges on both ownership and usage. The charges on the ownership side include a market determined price of Certificate of Entitlement (COE – introduced in May 1990), import duties (Singapore is largely duty-free), registration fees, GST and annual road taxes. On the usage side are fuel taxes, parking fees, and road charges based on an electronic road pricing system. Cars in Singapore are the most expensive in the world and as a result owning a car has become a status signal. On the other hand, the peak-hour traffic congestion in Singapore is the lowest among the rich cities in the world.

Expenditure Policy

On the expenditure side government consumption expenditure constitute about 10% of GDP and investment expenditure about 4%, most of which goes to infrastructure developments. Given the high savings and import leakages the multiplier effect of government expenditure in Singapore is extremely low. Nevertheless the Government uses infrastructure spending and off-budget packages as counter-cyclical measures. Obviously infrastructure spending entails more long-run beneficial effects that are not easily measured.

Among the key expenditure items in Singapore lies defense expenditure. In 2006 defense expenditure accounted for 33% of the total expenditure (the single largest expenditure item) and about 5% of GDP. Although some quarters in Singapore consider such high spending on defense as a waste the Government's position is that it is a premium that needs to be paid to sustain Singapore's progress; security cannot be taken for granted.

What was conspicuously absent in Singapore budget accounts was (welfare) transfers. The Singapore Government has been averse to a welfare state from the beginning. The Government considers that welfare payments not only drain fiscal resources but also erode work ethics and create an entitlement mentality. The basic philosophy of the Government has been to provide equal opportunity for every individual to enhance

his/her human capital and become self-reliant. Individual welfare is left to himself/herself and to the family and the community. Government subsidies are designed essentially along this line. Public education is almost free upto the university level. Public housing is provided at highly subsidized rates. Healthcare is basically a co-pay system but it is also subsidized for low income groups; subsidies in public hospitals range from 80% in class C wards to 20% in class B1 wards. Beyond this there has hardly been any social welfare until recently.

With changing demographics, in particular with aging population, and increasing income disparities the Government has begun to seriously reconsider its stand on social welfare. Since the mid 1990s the Government has put in place some special transfers on a piecemeal basis. Since most of these transfers were on one-off basis the amount of transfers have jumped up and down in different years. For example, between 1998 and 2007 the lowest was S\$52 million in 1998 and the highest was S\$ 5,264 million in 2001. A transfer that the Government has made mostly on a regular basis was CPF top-ups for Singapore citizens.

Central Provident Fund and Social Security

With the exception of a state-funded pension scheme for some civil servants, the mandatory savings in the CPF is the only formal social security scheme that Singapore has in place at present. The CPF is essentially a retirement fund that can be withdrawn, subject to maintaining a minimum sum, by members upon reaching age 55 or at death or on permanent disability or on leaving Singapore. The contribution rate was at a peak prior to 1986 at 50%; 25% from the employer and 25% from the employee. With changing economic circumstance the Government varied these rates and in 2006 the employer's rate was 13% and the employee's rate was 20%. The Government raised the employer's rate to 14.5% in July 2007 and implemented a tired system for low income workers to allow them to take a larger take-home pay.

For healthcare financing the Government in 1984 added on a compulsory Medisave account which draws a pre-specified percentage from CPF contributions. The account has a minimum sum and a ceiling that have varied over time. The Government later added on two other features for healthcare financing, Medishield (a low cost insurance scheme for catastrophic illnesses) and a Medifund (a health endowment fund for the poor). Together these are known as the 3M system. The Medishield is implemented on an opt-out basis. For higher income groups the Government introduced a Medishield Plus scheme on an opt-in basis. For the elderly who may need long-term care the Government introduced an Eldershield scheme. By and large healthcare in Singapore is a private responsibility. The Government claims that it incorporates the best features of the American insurance model and the UK taxation model.

The CPF now consists of three accounts, ordinary, special, and medisave. The special account is meant for retirement and as mentioned above the medisave account is for medical expenses. Over the years the Government liberalized the usage of the CPF funds

in the ordinary account for other purposes such as for house mortgages and some approved investments. The adequacy, rather the non-adequacy, of CPF for retirement and healthcare is a hotly debated topic in Singapore. Some have argued that the CPF is a mortgage finance scheme and not a pension scheme. The money locked-up in an illiquid house is not available for retirement and the discretionary savings among low income groups are virtually zero.

To help the low income Singaporeans who are mostly older workers the Government in 2006 introduced, instead of “welfare”, a “workfare” bonus scheme. Instead of an unemployment allowance an individual receives the workfare allowance only if he/she makes an earning. In the 2007 Budget the Government expanded the workfare scheme under the Workfare Income Supplement (WIS) program and introduced it more as a permanent feature. These transfers (somewhat similar to the US earned income tax credit scheme) depend on age, income level and whether or not the recipient had an employment at least for three months within the six month period prior to the claim. Again to save more for retirement most of the workfare transfers are made to the individual’s CPF account; the Government in 2007 set the cash to CPF ratio at 1:2.5. Although the WIS was a welcome move, setting aside too much in the CPF was seen as “not much help” for the poor who are struggling with their daily subsistence. The Government’s stand on this is to set aside more funds to help these people upgrade their skills and improve their earning capacity. At present, there are some proposals that are being discussed to address old-age social security and healthcare in Singapore.

MEDIUM TERM PROSPECTS

The steady high growth era of Singapore ended with the Asian Financial Crisis. Since then the economy has become more vulnerable to shocks and growth rates have become more volatile. There are two possible ways to stabilize the growth rate. One is to build up the consumption expenditure share of GDP from its current 40% to about 60%. Given that property and car prices are many folds higher than the affordable income levels, further rise in these prices strain the households and they cut back on consumption to pay up loans and to build up some savings. Instead of bubbles in the property market, if property prices move on at the rate of per capita income growth it is likely that the consumption share in GDP will pick up as it was observed after 1996. Given the limited land space in Singapore there is nothing much can be done to reduce the car population and to keep the prices down.

The other counteracting effect is likely to emerge from the new services drive discussed earlier. Most of the service industries in Singapore had a close link with manufacturing activities. As a result, business cycles in manufacturing created similar cycles in services. With branching off into new service areas that are not heavily linked to manufacturing the synchrony in the business cycles in manufacturing and services may be reduced and even reversed. This may help in reducing the volatility in growth to some extent.

Despite the possibility of volatile growth pattern, medium term growth prospects for Singapore remains bright. Singapore has been entering the emerging markets like China and India quickly. Under some highly plausible assumptions like Singapore's trading partners grow by at least 4% per year, and barring unforeseen debilitating shocks, simulation studies show that Singapore could grow on average by about 6-7% per year over next 10 to 15 years.

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