SINGAPORE: From the Asian Crisis to the New Economy

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Introduction

In the early 1960s Singapore was a Third World development basket case, with per capita GNP of less than US$320, double digit unemployment, poor infrastructure, a poorly educated population and labour force, and an economy facing economic stagnation and uncertainty. Over the next three decades, economic development was based first on industrialisation for the world market, and then on the twin pillars of manufacturing and exportable services. In the 1960s, the emphasis was on labour intensive manufacturing. In the 1970s, as the labour surplus economy gave way to full employment and emerging labour shortages, the economy restructured towards less labour-intensive activities in manufacturing and services. By then, manufacturing had emerged as the largest sector in the economy, surpassing the traditional trade sector. Increasing emphasis was placed on capital-intensive and skill-intensive industries and services. After the 1985-86 recession, the economic strategy shifted beyond a production base towards a total business centre and manufacturing and services as twin engines of growth. Singapore began to look towards knowledge-driven industries and globalisation and regionalisation for sustainable growth.

The Singapore economy grew at an average annual rate of over 8.5% during the 1965-97 period, leading to the attainment of one of the highest per capita incomes in the world. Singapore's economic success demonstrated how a small city-state with no natural resources can create economic advantages and achieve international competitiveness. The government and foreign investors played crucial roles in the economic transformation. The government adopted pro-development policies and has an excellent track record in economic management and governance. Foreign investment enabled Singapore to overcome initial inadequacies — lack of capital, technical knowledge, managerial expertise, and marketing channels — and become a highly competitive manufacturing base and an offshore financial centre.

In 1997-98 the Singapore economy was confronted by the Asian financial and economic crisis. However, with three decades of solid economic achievements, political stability and social cohesion, and with a swift package of short-term counter measures, Singapore was able to weather the devastating hurricane better than many neighbouring economies. The economy was on the road to recovery by 1999. Investment commitments in 1999 reached S$8.0 billion for manufacturing fixed assets and S$1.6 billion for services business spending, a level that surpassed the S$7.8 billion attained in 1998 and the target of S$7.5 billion for 1999. GDP growth for year 2000 is expected to recover to a robust 9-10%.

Singapore has already achieved one of the highest per capita incomes in the world. However, there is continuing concern over its economic sustainability and international competitiveness. Small size and lack of natural resources, including land and water, give the city-state a perpetual sense of vulnerability. Singapore finds itself entering the new millennium facing the challenges of globalisation, rapid technological change, and intensified global and regional economic competition. Its vision is to build a knowledge-based economy, where competitiveness is based on knowledge, innovation and creativity, and is putting in place strategies and policies towards that objective.

Singapore and the Asian Crisis

Impacts of the Crisis

Singapore is a small and open economy. Its heavy dependence on trade and its role as a financial centre continually exposes it to the discipline of the international marketplace, the ups and downs of global trade, international investment sentiments, and disturbances in the international financial system. To survive and prosper, it has to maintain strong macroeconomic and financial fundamentals, pursue sound economic and public management, and ensure continuing political and social stability.

Singapore's total trade in goods and services reached US$327 billion in 1997, or more than triple its GDP, and external demand accounted for two-thirds of total demand. Although only a city state of 650 sq km and resident population of 3.2 million, it ranked 13th in world trade in goods and services. Foreign investment penetration has been extensive — the stock of inward foreign equity direct and portfolio investment reached US$82 billion or 93% of GNP in 1997, while companies with over 50% foreign equity accounted for nearly 60% of the country's total corporate assets. Being a financial centre, foreign participation in the Singapore financial sector is probably one of the highest in the world — Singapore plays host to over 200 foreign commercial and merchant banks and non-bank financial institutions, while its Asian Dollar Market (ADM) is the world's 8th largest offshore lending centre with assets of US$375 billion in 1997.

The Asian Crisis which erupted in July 1997 plunged the Singapore economy into recession. But the impact was not as serious as for many other East Asian economies — the banking system remained intact and the corporate sector did not collapse. The following are some indicators of the impact of the Crisis on the economy.

* GDP growth rate: The GDP growth rate plummeted from 8.4% in 1997 to 0.4% in 1998 as a result of the Crisis-induced fall in regional demand as well as the fall in global demand for electronics, Singapore's major export to the world. Domestic consumption demand also weakened with plunging stock and property prices, falling incomes, and job retrenchments, while domestic investment demand was affected by excess capacity, economic uncertainties and tight liquidity. The economy rebounded in 1999 with a growth rate of 5.4%, reflecting the upturn in the global electronics cycle, some recovery of regional demand, and the cost-cutting measures undertaken in 1998-99 to regain cost competitiveness and restore investor confidence.

* Unemployment: Since the last 1985-86 recession, Singapore had been enjoying full employment and experiencing growing labour shortage. With the Crisis, the unemployment rate rose to 4.4% by December 1998. Retrenchments and job losses were concentrated in manufacturing, commerce and construction. With economic recovery, job retrenchments eased and the unemployment fell to 2.9% by

December 1999. However, economic restructuring continues to lead to shedding of jobs at the lower end of the skills-spectrum.

* Exchange rate: In the first year of the Crisis, the Singapore dollar depreciated against the US dollar by about 15%, but rose sharply against the devalued currencies of Indonesia, Malaysia, Thailand and South Korea. The Monetary Authority of Singapore (MAS) reported that the Singapore dollar had not been subjected to strong speculative attacks. MAS reiterated that Singapore would not restrict the movement of short-term capital (as in Malaysia) and would continue to manage the exchange rate, but within a wider band because of the increased market volatility.

* Asset prices: Heavy investments by local and foreign capital in the stock and property markets in the economic euphoria of the early 1990s led to market overheating and asset bubbles. Stock and property prices peaked in mid-1996 and declined before the onset of the Crisis, as a result of increasing caution on the part of investors and buyers as well as efforts by the Singapore government to cool the property market through restricting bank credit for housing loans and other anti-speculation measures. The outbreak of the Crisis saw further price falls – the stock price index fell by over 60% off its peak by 1998 third quarter, while the property price index fell by over 30% by mid-1998. Falling asset values undermined the balance sheets and profitability of property companies and financial institutions.

* Trade sector: Exports of goods did not decline as much as exports of services, as the former was more dependent on global demand and the latter on regional demand. The decline in goods exports to the region was somewhat offset by the continuing buoyancy of the US and EU markets. Service exports were more severely affected; for example, entrepot trade turned negative, and tourist arrivals from the region fell sharply. However, imports fell sharper than exports, so the trade balance and current account actually improved.

* Capital account: There was a dramatic reversal in the flow of funds, from an inflow of S$53.6 billion in 1997 to an outflow of S$26.5 billion in 1998. Foreign

banks in Singapore, which had traditionally relied on funding from head offices and Asian Dollar Market for their credit activities in Singapore and the region, sharply scaled back such funding and credit activities. Apart from the outflow of bank funds, there was also a net repayment of offshore loans. The balance of payments surplus fell from S$11.7 billion in 1997 to S$5 billion in 1998, with a corresponding slowdown in growth of official foreign reserves.

* Financial sector: In contrast to the buoyancy of earlier years, the financial services sector contracted, albeit marginally in 1998, reflecting the sharp contractions in the offshore Asian Dollar Market. Loans to the region's crisis-economies contracted as investment projects were postponed or cancelled; Japanese banks in Singapore consolidated their regional lending activity because of mounting non-performing loans and the need to raise capital adequacy ratios at headquarters to meet Bank of International of International Settlements (BIS) requirements. Local financial institutions were weakened by non-performing loans, largely because of regional loan exposures. On a prudential basis, total cumulative loan provisions of these banks rose sharply, causing net profits to plunge 32% in 1998. However, balance sheets remained fairly healthy, and capital adequacy ratios remained substantially above the 12% minimum specified by MAS and the 8% minimum of BIS. There were no bank failures or bank runs.

* Corporate sector: Business slowdowns and uncertainties led to fall in corporate earnings and down-sizing of business operations. For example, deteriorating demand conditions and provisions for non-performing loans and bad debts reduced the reported profits of the 190 companies listed on the Stock Exchange of Singapore. Financial prudence led to a growing number of these companies making record provisions for non-performing loans, as well as providing for reduced values of their investments and potential losses on their projects. In particular, listed property companies wrote down the values of assets by some S$1.5 billion. Liquidity was tight, with the domestic bank prime lending rate rising to 7.8% by May 1998 and banks tightening loan criteria. Interest rates started to downtrend only from 1998 third quarter.

Why Singapore Succumbed Less to the Crisis?

Singapore did not succumb as seriously as several regional economies even though it has the most open economy. Openness and vulnerability to external changes and shocks rendered the task of macroeconomic management more difficult. At the same time, smallness and a single-tier purposeful government made for more flexible and speedy policy responses. Both fundamentals and policies explain why the Singapore economy escaped the full contagion effect of the Crisis.

1) Strong economic and financial fundamentals

Singapore's sound fundamentals, which helped to sustain investor confidence during the Crisis, are seen in the following indicators — high savings and investment rates, with the national savings rate averaging over 45% of GNP in recent years; strong current account surpluses, reaching 15% of GNP in 1997; strong balance of payments position and official foreign reserves which reached US$81 billion at end-1997, one of the highest in the world and which acted as a deterrent to currency speculation; no official foreign debt; attractive location for foreign direct investment and multinational corporations; strong government budgetary positions with budget surpluses for most years; low corporate debt to shareholder capital; and sound banking system.

2) Sound macroeconomic and financial policies

Singapore's strong economic and financial fundamentals reflect the decades of pro-development economic policies and prudent and efficient public economic management.

* Industrial and trade policies: Except for a short period in the early 1960s,

when import substitution was introduced temporarily to jump-start industrialisation, Singapore has pursued export manufacturing and a free trade policy with minimal restrictions on imports and exports. Together with market oriented policies and the large presence of foreign investments, these have ensured domestic and international competitiveness. Investments did not go into protected industries lacking competitive advantage and companies did not receive political patronage.

* Fiscal discipline: A prudent fiscal policy is viewed as the foundation for macroeconomic stability and sound financial position, resulting in low inflation, low interest rates, and a stable currency. The government has had consistent budget surpluses. There is no foreign debt incurred by the public sector. As a precautionary measure against future profligacy, the constitution was amended to constrain the ability of an elected government to use the country's accumulated official reserves to finance budget deficits. With a buoyant economy and fiscal prudence, the government has been able to invest heavily in infrastructure and education and yet able to reduce the income tax burden on businesses and individuals over the years.

* Social safety net and social equity: The government eschewed the western welfare state for its drain on the public purse. Instead, the social safety net is provided by robust economic growth and full employment, and by a self-funded Central Provident Fund (CPF) of compulsory savings for old age, housing and medical needs. By 1997, the CPF provided cover for 2.8 million in the population. Subsidised housing as well as the use of CPF savings enabled 85% of the population to enjoy home-ownership in modern housing. Social equity has been maintained with rapid economic growth, full employment, low incidence of absolute poverty, and upward social mobility.

* Monetary policy: In a small open economy, the exchange rate and interest rate are inter-dependent. As such, Singapore chose to target the exchange rate variable rather the interest rate. Thus monetary policy plays a secondary role in maintaining price stability. It is the confidence in the Singapore dollar and the

exchange rate that have allowed interest rates to decline.

* Exchange rate policy: Singapore has been on a managed float system since June 1973. The exchange rate policy is to achieve a low inflation rate and a strong and stable Singapore dollar. With the lifting of all exchange controls by 1978, the policy responses to the large capital inflows have been through management of the exchange rate, a sound financial system capable of intermediating the capital inflows, and strong fiscal discipline. The Singapore dollar is managed against a trade-weighted basket of currencies of Singapore's main trading partners. MAS sets a target band for the exchange rate. Before the Crisis, MAS allowed an upward appreciation of the Singapore dollar to contain inflationary pressures. Since the Crisis, MAS adopted an easier policy stance and widened the target band for intervention because of the volatility and uncertainty in financial markets. While the Singapore dollar has depreciated by about 15% against the US dollar, it has remained relatively stable against the nominal trade-weighted basket.

* Open capital account and currency internationalisation: The Crisis has highlighted the imprudence of capital account liberalisation without strengthening the domestic financial sector and putting in place an adequate prudential supervisory and regulatory framework. For Singapore, financial liberalisation had been progressive since the early 1970s, marked by decontrol of exchange rates and interest rates. With an open capital account, direct control of capital flows has been replaced by close supervision and regulation of financial institutions. In the absence of capital and exchange controls, funds can move freely into and out of Singapore, whether in Singapore dollars or foreign currencies. So various policies were put in place to insulate the domestic economy from the financial centre's offshore activities and prevent the internationalisation of the Singapore dollar and its potential destabilising effect. The separation of Asian Currency Units (ACUs) and domestic banking units (DBUs) enables official monitoring of the use of ACU funds, especially the extent to which they are lent to domestic operations. ACU activities are confined to non-Singapore dollar transactions. By 1997, ACU assets, denominated largely in US dollars, stood at US$479 billion, much larger than the

domestic banking system. Lending to non-residents in Singapore dollars are restricted, to pre-empt de-stabilising currency speculation. MAS requires approval for loans exceeding S$5 million to non-residents or to residents where the Singapore dollar is to be used outside Singapore.

* Sound banking system: The Crisis has highlighted financial sector weaknesses in several East Asian economies. In Singapore, banks had been generally prudent in their lending practices. MAS has been noted for its strict prudential regulations and supervision to maintain a sound domestic banking and financial sector, which helped contain non-performing loans (NPLs). Before the Crisis, NPLs were 3% of loans; during the crisis, NPLs rose only to 12%, most of which was on account of lending to the region. Singapore banks are required to have capital adequacy ratios (CAR) that well exceed the BIS standard. MAS requires fortnightly reports on capital funds of foreign banks and inter-bank indebtedness with banks outside Singapore and monthly reports on loans and advances to bank directors. Loan regulations restrict credit to any individual or group of individuals to not more than 25% of a bank's capital. Equity investments of banks are also restricted. MAS approval is required for the appointment of bank directors and senior executives.

3) Political governance and rule of law

The Crisis has highlighted governance, or lack of it, as a major contributory factor or at least as an aggravating factor. The lack of good governance is manifested in corruption, cronyism and nepotism in some of the crisis-countries. In contrast, good governance has helped Singapore escape the worst ravages of the Crisis. The competence, integrity and probity of the Singapore political leadership and bureaucracy are well known, helping to transform Singapore from a stagnating entrepot economy of the early 1960s into a showcase of economic development, and brought social cohesion into the multi-ethnic and multi-religious society. Singapore's success in combating political and bureaucratic corruption and cronyism may be attributed to several factors — high moral code of the PAP political leadership and their determination to stem out corruption in public service; severe penalties for corrupt practices; reduced discretionary power of the public service and its ability to "dispense favours" in an economic system characterised by openness and transparency, minimal restrictions and regulations, and efficiency in service delivery. The best and ablest are attracted into the public service through a meritocratic reward system of attractive salaries and benefits and promotion based on performance.

Policy Response - Cost Cutting Measures

At the outset of the Crisis, so as to maintain investor confidence and strong country credit ratings, the Singapore government re-iterated that it would continue to rely on market forces, maintain free capital flows and foreign investments, and remain plugged into the global economy. It eschewed capital controls and competitive currency devaluation and continued to manage the exchange rate against a trade-weighted basket, albeit with greater flexibility within a widened target band.

With the heavy dependence on exports of goods and services and the high import leakage of domestic consumption and investment demand, Singapore eschewed Keynesian pump priming to reflate the economy. The government also did not bail out failed companies. Instead, Singapore's response to the Crisis was to focus on cost cutting and tax reliefs to reduce operating costs of business enterprises to help offset the loss in competitiveness posed by the massive depreciation of regional currencies and so to save jobs, as well as to lower the living costs of individuals and households in the face of falling incomes and job retrenchments. Measures in the form of rebates in taxes and government charges across the board, and reduced employers' monthly contributions to employees' retirement funds, amounted to 7% of GDP.

Three "relief packages" were announced in 1998. Initially, the February

1998 government budget contained minimal relief measures as the government did not anticipate a major fallout from the regional Crisis. But as the economic downturn worsened, a $2 billion off-budget package of cost cutting and stimulus measures was announced in June. As it became evident that this was not enough, a further round of cost-cutting measures targeted at job maintenance was announced in November. A major feature of these cost-cutting measures was the target cut in wages and benefits, involving halving of the 20% compulsory Central Provident Fund (CPF) contributions by employers as well as a 5-8% wage cut recommended by the tripartite National Wages Council; together these amounted to a 15% reduction in the earnings of workers and wage costs of businesses. Other elements of the cost-cutting package included lower tariffs and user charges of government agencies and tax rebates for businesses and individuals. The various cost cutting measures were estimated to reduce business costs by about 15%.

Policy Response - Banking Sector Reforms

While Singapore's stringent prudential supervisory and regulatory framework helped shield its financial sector from the full brunt of the Asian Crisis, there had been growing pre-Crisis concerns that protection of local banks and stockbrokers from foreign competition, and over-regulation had stifled the development of the financial centre. Singapore would need a radical change in approach. The main thrusts of financial sector reforms are to create a more conducive regulatory environment, and for MAS to play a more pro-active role in financial sector development.

A 5-year liberalisation programme for the domestic banking sector was launched in May 1999. The aim is to move towards a more open and competitive environment so as to spur the development of local banks to strengthen the banking system, provide Singaporeans with quality banking services, and enhance Singapore's position as an international financial centre. The government warned that local banks will be progressively marginalised if no radical change is undertaken.

Unlike the open policy pursued for the manufacturing sector, the Singapore government has protected local banks, especially in retail banking, to enable them to expand and contribute to the resilience and stability of Singapore's financial system. As in other Asian countries, the local banks started as family banks and although they have become publicly listed companies,they are still largely run by their controlling shareholders. Fortunately, strict prudential supervision by MAS have enabled them to grow into soundly managed and well capitalised institutions by Asian standards. But the local banks have not measured up to international standards of size, expertise, range and quality of service, as well as shareholders' returns. Therefore in 1999 the move was made to open up the Singapore market to foreign competition, in an effort to spur efficiency and innovation among the local banks. To prevent the liberalisation from weakening these banks and destabilising the financial system, the big bang approach was eschewed and a phased liberalisation put in place. The liberalisation programme has 3 elements:

* First, MAS implements a 5-year programme to liberalise access by foreign banks to Singapore's domestic market. A new category of full banking licence known as Qualifying Full Banks (QFBs) has been introduced and MAS will issue up to 6 QFBs over the 1999-2001 period; incumbent foreign full banks not awarded QFBs will retain their existing privileges. MAS will also increase the number of restricted banks, and give offshore banks greater flexibility in Singapore Dollar wholesale business.
* Second, to survive in the new liberalised environment, local banks have to increase emphasis on efficiency, quality of service and shareholder returns; most importantly, they must strengthen corporate governance, attract leadership talent endowed with the necessary autonomy to make professional management decisions. MAS requires all local banks to appoint Nominating Committees within their boards to ensure the appointment of the most competent individuals to their boards and key posts; the majority of board members must be Singapore citizens or permanent residents and comprises mainly independent directors.

* Third, MAS lifted the 40% limit on foreign investors' total shareholding in local banks. It viewed that the requirement for Nominating Committees and for board members to comprise a majority of Singapore citizens and permanent residents are adequate to ensure national control.

With banking liberalisation is the need for more effective banking supervision. The revised banking supervision has the following features:

* First, refining the capital adequacy ratio (CAR) requirement of local banks: Hitherto, local banks had to maintain a CAR of 12%, comprising entirely Tier 1 or equity capital, which is higher than the BIS 8% requirement. Singapore banks are therefore overcapitalised, which raises the cost of funds to the banks and lowers their return on equity. In December 1998, CAR requirements were modified, to reduce the minimum Tier 1 capital requirement from 12% to 10% and to allow for Upper Tier 2 capital to be used as regulatory capital for the remaining 2%. With the worst of the Asian financial crisis over, and to allow Singapore banks further flexibility in managing their capital, in September 2000, MAS announced further changes to CAR – the minimum Tier 1 CAR component for Singapore incorporated banks is further lowered to from 10% to 8%, while the total CAR requirement will remain unchanged at 12%; the balance of the total CAR requirement (ie up to 4%) may comprise Upper Tier 2 capital. The components of Upper Tier 2 capital are unchanged. The new CAR requirements will continue to exceed the current Basel Committee standard of 8% including a minimum Tier 1 capital requirement, as well as that observed in other major financial centres.

* Second, from December 1998, MAS allowed banks to use internal models for calculating market risk capital. Guidelines on the use of internal models and back-testing were sent to the 5 local banks in March 1999. Encouraging the use of internal models provides incentive for banks to improve their risk management systems.

* Third, MAS has prescribed the minimum standard of disclosure that banks and merchant banks should comply with.

Economic Strategies for the 21^{st} Century

Singapore's vision on the dawn of the 21st century is to become an advanced and globally competitive *knowledge-based economy* (KBE). For sustainable development, Singapore cannot continue on the old path. For an economy which has already attained one of the highest per capita incomes in the world, competitiveness can no longer be based on cost alone. Singapore needs to develop new capabilities in technology development, innovation development and market development. For the longer term, it plans to position itself as a critical hub where foreign MNCs and local enterprises use Singapore to produce high value added products and provide manufacturing-related and headquarters services to the region. It plans to move along the value chain into research and development, design, logistics, marketing and sales. And finding the right strategies alone is not enough. Singapore also needs social cohesion to achieve the goals.

Manufacturing and Services as Twin Engines

The Committee on Singapore's Competitiveness (CSC) commissioned by the Singapore government to review Singapore's economic future issued its report in November 1998. The *Competitiveness Report* recommends that manufacturing and services remain the twin engines of growth, so as to exploit the manufacturing-services linkage, have a broader economic base to reduce vulnerability, as well as balance a global orientation of export manufacturing with the regional orientation of exportable services.

The *Report* recommends the following strategies to develop Singapore's manufacturing sector and overcome its weaknesses:

* Integrate Singapore into the global economy so as to leverage on international talent, knowledge and technology.
* Position Singapore as a premier hub for the region so that foreign MNCs and local enterprises use Singapore as a production base for high value added products

and provide manufacturing-related services for subsidiaries in the region.

* Develop a strong external wing to overcome Singapore's small size and limited resources.

* Maintain cost competitiveness by ensuring productivity growth.

* Provide an entrepreneurial environment which is more tolerant of business failures and allows greater freedom for the generation of ideas.

* Embrace innovation to generate new businesses and growth.

* Groom world class local and foreign companies in niche areas.

* Have a balanced mix of manufacturing activities to provide better resilience.

* Build strong manufacturing capabilities in existing niche areas such as electronics and chemicals and emerging areas.

* Develop strong competencies in other parts of the manufacturing value chain, including R&D, design, logistics, marketing and sales.

The *Report* also envisions Singapore as the premier services hub in Asia with expansion of existing hub services such as financial services, international trading, transport and logistics, exhibition management and tourism, as well as development of new high growth hub services such as healthcare, education, media, information and communications technology services, e-commerce and direct marketing. The Report recommends the following strategies:

* Be the centre in Asia for knowledge and skill intensive and other high value added services where Singapore has core competency,

* Provide a business environment to attract top global service companies.

* Have an externally oriented services sector focused on the international market.

* Have a pool of world class local services companies with established niches in overseas markets.

* Tap the world market to attract creative manpower and talent.

* Use information and communications technology (ICT) to enhance competency and overcome Singapore's physical and manpower limitations.

The blueprint for the development of manufacturing is *Industry 21*, a 10-year plan with the following goals – to develop Singapore into a global hub of knowledge-driven industries in manufacturing and traded services with emphasis on technology, innovation and capabilities; encourage MNCs to locate more of their key knowledge-intensive activities; and encourage local companies to embrace more knowledge intensive activities and become world class players. Five broad strategies are proposed – diversify among and within industry clusters for a balanced and robust mix of industries and markets; build up world class capabilities and global coverage; promote innovation; develop local talent and attract foreign talent; create a conducive business environment and world class infrastructure.

The EDB has identified 5 broad strategies to achieve the I21 vision – diversify among and within industry clusters for a balanced and robust mix of industries and markets; build up worldclass capabilities and global coverage; promote innovation; develop local talent and attract foreign talent; and create a conducive business environment and worldclass infrastructure. Under I21, EDB is nurturing the following industry clusters and development programmes – electronics, chemicals, life sciences, engineering, education and healthcare, logistics, communications and media, headquarters, world class companies and promising local enterprises, innovation, international business; resource development, and co-investment.

* In *electronics*, the vision is to grow a world-class electronics hub, with the latest product design, manufacturing and applications in semiconductors, infocomms products, data storage and key modules; and management of new products, applications and markets. In 1999 the electronics industry recorded an output of S$70.1 billion, with growing contributions from infocomm products and semiconductors.

* In *chemicals*, the aim is to be a world class petroleum, petrochemicals and specialty chemicals sub clusters. Jurong Island is being developed as chemicals hub.

* *Life sciences* is a new industry cluster that EDB is promoting under *Industry 21.* The vision is to grow into a life sciences hub with world class capabilities in pharmaceuticals, medical devices, biotechnology, agribiotech products and food intermediates. Life Sciences needs a strong R&D foundation and build new capabilities. Research institutes include the Institute of Molecular and Cell Biology, Bioprocessing Technology Centre, Centre of Natural Products Research, Institute of Molecular Agribiology, and Bioinformatics Centre. Singapore is also encouraging more collaborations and partnerships between the local research institutions and renowned academic centres abroad. The local universities are also giving greater emphasis to life science teaching and research.

* In *engineering,* the aim is to generate growth potential for existing industry clusters and raise the possibility of creating new industries by developing multi-disciplinary capabilities and state-of-the-art technologies. Engineering has always supported the electronics and chemicals clusters. It now also supports new fields such as optics, semiconductors and pharmaceuticals and promotes new business models to embrace e-capability.

* In *infocomms and media,* the aim is to build Singapore into an Asian hub for the digital economy, resulting in a wide range of initiatives and developments in telecommunications, IT, media, e-commerce and internet. The telecommunications sector has been liberalised and greater competition introduced into the local broadcast and print media industries. Parallel with efforts to strengthen the telecommunications infrastructure is the active promotion of software development, internet builders, application service providers, portals and intermediaries.

* In *education and healthcare,* the vision is to position Singapore as a world class education and healthcare hub, including attracting world class universities, executive learning centres, corporate training centres and distance learning providers to set up in Singapore teaching and research facilities in education, and to be the place for timely, reliable clinical trials and analysis.

* In *headquarters,* the aim is to build on Singapore's reputation as the premier location for MNCs and attract them to base their regional and business

headquarters.

* In *logistics*, the vision is to develop Singapore into a leading integrated logistics hub in Asia, where third party logistics players, cargo airlines, value added distributors and manufacturers locate their Asian supply chain centres and help build up supply chain capabilities.

To develop the industry and service clusters are programmes aimed at promoting enterprise and innovation. On local enterprise, although Singapore has played host to thousands of foreign multinational corporations (MNCs), it has so far failed to produce an indigenous multinational in the category of "Fortune Global 500". Aspirations to advanced-economy status with economic depth and resilience includes producing indigenous world class companies with core competencies and able to exploit the opportunities and compete effectively in the regional as well as global markets. Singapore's earlier industrial policy focused on attracting foreign enterprises and neglected the nurturing of domestic enterprise. Since the mid-1980s, however, the EDB has been more pro-active in local enterprise development, particularly as supporting industries and linking them with foreign MNCs to facilitate technology transfer and market networking.

The *Competitiveness Report* recommends the following strategies to strengthen local enterprises — consolidate and pool resources among local enterprises to achieve synergy and competitiveness, such as through linking private sector companies with government-linked-companies (GLCs), as the latter have advantages of size, financial resources, core capabilities and experience in venturing abroad; improve the supply of engineering and managerial manpower through expanded education and training facilities; promote innovation and technology, such as through government provision of funding and facilities and incentives for commercialisation of innovation, acquisition of technology, and technological upgrading; building indigenous products and brand names; and greater international and regional orientation. The EDB aims to build local world-class and knowledge-based enterprises, which are world class in their product, service and capability. The EDB works closely with potential world class companies on financial resources for mergers and acquisitions, resource support, image building, technology acquisition, strategic alliances and business partnerships. This effort complements the EDB's *Promising Local Enterprises* programme and the Productivity and Standard Board's *SME 21 programme*.

The EDB's *co-investment programme* aims at strengthening Singapore's partnership between foreign MNCs and promising local enterprises in key industry clusters, through equity co-investment both within and beyond Singapore. The EDB manages the Cluster Development Fund and the Venture Capital Fund, aimed at addressing critical gaps in the industry clusters by developing new capabilities, technology projects and innovative start ups. Since 1985 the EDB has engaged in direct venture capital investment activities to grow the VC industry and support industry cluster development and regionalisation and promote innovation and entrepreneurship. Venture capital funds have grown to S$10.2 billion by 2000. The VCF is also leveraging on partnership with global VC funds and government agencies to invest in more young companies in Singapore and abroad.

Manpower and Technopreneurship Development

To become a competitive knowledge-based economy, Singapore has adopted a two-pronged strategy to upgrade its own pool of human resources and to augment it with foreign talents. For the latter, Singapore must leverage on international talent and networks to overcome its limited size and resources. A systematic policy of recruiting foreign talent has been put in place, with EDB tasked with promoting inflow of foreign talent in addition to its traditional role of promoting inflow of FDI. Measures to attract foreign talent include promoting a more cosmopolitan living environment in Singapore, establishing an internet-based international talent recruitment website, developing programmes to enable talents to work in overseas operations of Singapore companies, and cultivating a wide network of "Friends of Singapore". Responding to concerns of the citizenry over competition for high-end jobs, the government has gone to great lengths to explain the rationale, that the foreign talent pool will enable Singapore to remain competitive and a larger robust economy means an absolute gain for Singaporeans.

For the former, funds for education and training have grown rapidly in the past two decades and have been directed to formal education from primary to tertiary levels, continuing education and skills training. With the need for rapid industrial restructuring pressured by both technological change and maintaining international competitiveness, the future jobs profile will require more top-end professional, managerial, technical and specialist personnel. The anticipated workforce profile would have 65% with post secondary education, 20% with secondary education and the remaining 15% with primary education or below. The resources being poured into education will ensure new job market entrants have the requisite skills. The educational curriculum and teaching methods in schools, polytechnics and universities are being revamped to emphasise "learning to learn" and analytical, creative, entrepreneurial, good problem-solving and inter-personal skills. A major problem, however, is with those already in the workforce, particularly those still below 40 years of age, who do not have even secondary school qualifications; these workers have to be upgraded and reskilled to prevent structural displacement. Manpower 21 (M21) outlines several strategies for a globally competitive workforce, including integrated manpower planning to identify and enhance the short and longterm fit between manpower demand and supply; lifelong learning for lifelong employability; and transforming the work environment towards more flexible work arrangements and job re-design to keep pace with the nature of knowledge-based work and increase participation rates of women and older persons.

The Singapore government launched *Technopreneurship 21 (T21)* in April 1999 to stimulate a climate of innovation and creativity by creating the infrastructure and the environment for creativity and entrepreneurship to thrive. The T21 initiative covers 4 areas which are critical for the technology sector to flourish.

* *Education:* Singapore is revamping the education system in schools and developing universities into world class institutions which are not only generators of trained manpower but also generators of business opportunities. MOE through its "Thinking schools, learning nation" programme is upgrading school curriculum to make sure that young people have the necessary preparation to work effectively in the new economic world where change and enterprise are distinguishing factors. Singapore universities and polytechnics are much more conscious of the need to infuse a sprit and enthusiasm for entrepreneurship in their students and have organised courses, seminars and activities to give their students the necessary knowledge and skills to launch into entrepreneurial careers. In addition to our own tertiary institutions, world class institutions like MIT, Wharton School, Chicago School of Business and INSEAD have set up local campuses or alliances which have attracted many talented people from the region and overseas to come and study in Singapore and enrich our talent base.

* *Financing:* The US$1 billion Technopreneurship Investment Fund was announced in 1999 to attract more venture capital activities to Singapore. TIF has succeeded not only in attracting international top tier Venture Capital companies to locate in Singapore but in making finance more easily available for start ups in Singapore and the region.

* *Facilities:* There are plans to create comfortable and conducive facilities that provide an intellectually stimulating and creative environment for technopreneurs. A major step is the development of the Science Hub with world class facilities which are attractive to international talent working in knowledge industries, especially in high technology.

* *Regulations:* Rules and regulations are being reviewed to remove obstacles to technopreneurship. For example, the bankruptcy regime was reviewed to help those who had fallen to get up again. Long term social visit passes are available to foreign technopreneurs who are interested to build their business in Singapore. Technopreneurs are allowed to start offices in their public housing homes. The tax

treatment for stock options was reviewed and enhanced. As a general approach, the government will make rules and regulations less prescriptive and favour a "negative list" approach, that is, what is not explicitly prohibited is permissible. To ensure that rules and regulations are reviewed in a timely and comprehensive fashion, the Public Service has set up a pro-enterprise panel to give the process of rules review a bigger push.

Information and Communications Technology

Singapore is also pushing for further development in information and communications technology (ICT) both as a business enabler and to position itself as an ICT hub. In 1992 the National Computer Board (NCB) released the *IT2000 Report* which envisioned Singapore as an "Intelligent Island", with an advanced National Information Infrastructure (NII) interconnecting computers in virtually every home, office, school, public library, community club, factory and workplace, and linking government, business and people in cyberspace. IT2000 has the following major thrusts — intensified development of ICT-related manpower; improved quality of life; improved personal and community communications; and competitive advantage using the National Information Infrastructure.

The key vehicle for making Singapore an intelligent island is *Singapore One*, launched commercially in June 1999 as an island-wide broadband infrastructure of high capacity networks and switches for multimedia applications and services. Users have access to entertainment, news, education, online shopping and other e-commerce services, video-conferencing, government transactions, as well as fast Internet. At end-1999, Singapore ONE offered a total of 180 applications, and there were 100,000 users. As a city-state with world class physical infrastructure and adequate financial resources, Singapore has little difficulty in developing the nation-wide IT infrastructure. More problematic is achieving the quantity and quality of IT manpower targets.

The 1998 *Competitiveness Report* recommends that Singapore should focus initially on the following areas:

* Communications and media: Singapore's educated and multilingual and multicultural background gives it a competitive edge as the content gateway to the East and West. To that end, Singapore should attract creative talents from the world and improve enforcement of intellectual property rights protection. Singapore ONE can be used to jumpstart the local multimedia and broadband industries.
* IT innovation: Singapore should position itself as a nation-wide test bed where new and innovative products and services are created, customised and tested before export.
* E-commerce: E-commerce is expected to present tremendous business opportunities and impact on several related sectors such as logistics, transportation and financial services. The government is already setting up various infrastructure to establish Singapore as an e-commerce hub.

In December 1999, reflecting the global convergence of information technology and communications, the National Computer Board (NCB) and the Telecommunications Authority of Singapore (TAS) merged to form the Infocomm Development Authority of Singapore. IDA's mission is to spearhead Singapore's drive to be a vital global infocomm centre, catalysing Singapore's transformation into a knowledge-based and digital economy and society. As with the revised role of the Monetary Authority of Singapore with regard to financial services, it functions as both regulator and promoter of ICT services. The IDA's *Information and Communications Technology 21 (ICT 21)* master plan has 3 strategic thrusts – to develop ICT as a major sector of growth; to leverage on ICT as an enabler to boost the competitiveness of key economic sectors; and to prepare Singapore for the information society of the future.

Under *ICT 21*, IDA has been working closely with industry partners and other government organisations to map out 3 manpower strategies for the infocomm sector:

* First, to enhance the environment to nurture a net-savvy workforce –

establish world class infocomm education; enhance capability of infocomm manpower, with IDA targets to train about 20% of infocomm manpower every year through multiple initiatives targeting at different audiences; develop a net-savvy workforce through training programmes on core infocomm skills; develop infocomm skills standards for infocomm professionals and users. IDA works with industry and higher learning institutions to offer appropriate infocomm training to students and those already in the workforce. For students, the target is to have 30% of school curriculum computer-based. And tertiary institutions will do more to infuse core infocomm skills into the curriculum and nurture a pool of graduates who will eventually become infocomm specialists to meet industry needs.

* Second, to attract and retain international infocomm talents; IDA facilitates entry of international talents through faster and more efficient work pass application processes; it also embarks on overseas recruitment missions to attract international infocomm talents and implement programmes to encourage them to stay in Singapore; it also attracts foreign students to augment the local infocomm student pool.

* Third, to establish Singapore as the e-learning hub for the region. E-learning is an important enabler in the digital economy as people can learn anytime and anywhere. IDA, in collaboration with other government agencies and industry, is putting in place an e-learning infrastructure and developing online content; the government is also attracting and fostering alliances with world class e-learning service providers.

IDA is also the lead agency in charge of the national e-commerce strategies and programmes. An *E-Commerce* master plan was launched in September 1998 to mark the start of a campaign to bring e-commerce to mainstream businesses and the public and to attract international e-commerce activities.Singapore also has a vision of being an international e-commerce hub, where e-commerce transactions from the region and around the world are processed. The Electronic Transactions Act (ETA) was enacted on July 1998 to create the legal framework for e-commerce transactions in Singapore. To strengthen the adoption of e-business and increase e-commerce transactions among businesses in Singapore, IDA and PSB has put in place a S$30 billion incentive programme known as e-Business Industry Development Scheme (eBIDS). eBIDS has two plans – Plan 1 supports up to 50% of the qualified e-commerce-related consultancy, subscription fee for up to 12 months of hardware and software purchases, capped at S$20,000 per company; Plan 2 is targeted at companies that already have existing e-commerce capabilities and wish to expand further on their e-business value creation, with IDA providing funding up to S$500,000.

As part of the competitiveness drive, in January 2000 the government unveiled an accelerated timetable for liberalisation of the telecommunications sector, bringing forward full competition in the sector by 2 years from April 2002 to April 2000, and immediately lifted the existing direct and indirect foreign equity limits of 49% for all public telecomms services licences; IDA would adopt a very liberal policy when assessing new entrants; in general and not restrict the number of new licences issued except where there are spectrum limitations. The liberalisation move was followed by measures to support ICT development, including changes to the legal and policy environment, assistance to promising local enterprises, development of a strong broadband network and an ICT manpower development programme.

Summary and Conclusion

Singapore has not been as seriously affected by the Asian currency and financial crisis as has several countries in the region. For the latter, the crisis has necessitated not only stabilisation measures and structural reforms to restore investor confidence and financial health, but has been complicated by or resulted in political and social turmoil. There have been growing demands for greater government transparency, accountability and responsibility and for social safety nets for the poor and unemployed.

Regional contagion sucked Singapore into the Asian Crisis. General business and consumer sentiments in Singapore were adversely affected by the regional downturn and the Singapore growth rate plummeted in 1998. However, there had been no collapse of the Singapore currency, or financial and corporate sectors, nor political and social unrest. The relatively mild negative outcomes reflected Singapore's strong economic and financial fundamentals and good governance as manifested in sound macroeconomic and financial policies, strict prudential regulation and supervision of the financial sector, and the accountability and responsibility of politics and government.

At the dawn of the 21st century, the Singapore economy has come a long way. It has achieved political stability, social cohesion, a high quality of life and a highly competitive economy. It has been driven by a strong sense of political and economic vulnerability arising from its geopolitical position in Southeast Asia and its small physical size. The pursuit of a stakeholder society and good governance have enabled Singapore to achieve its goals. For the next lap, with globalisation providing intense competition, Singapore's continuing economic prosperity will largely depend on its ability to compete on capabilities rather than costs. The vision is a knowledge-based economy and many strategies and policies are being developed and implemented to achieve this objective, including a large and continuing role for foreign MNCs and a growing importation of foreign talents to enable Singapore grow beyond the limits of its small physical size and small demographic base. The forward looking government is putting in place longer term measures to ensure Singapore's continuing competitiveness in the era of globalisation and information technology. Blueprints such as Industry 21, ICT 21 and Technopreneurship 21 chart the directions for the economy.

The political leadership and policy makers have the challenging task of convincing the Singaporean business community and the Singaporean workforce that the KBE is a shared vision and a positive sum game as well as convincing the highly mobile international investors and international professionals to put their stakes in Singapore.

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