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Strategic Development of HK/China Manufacturing Industries

By

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**A thesis submitted for the degree of Doctor of Philosophy to the
University of Warwick
Engineering Department
Warwick Manufacturing Group**

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SUMMARY

Since China adopted its Open Door policy, many of the Hong Kong low cost manufacturing activities have been relocated to China. This project analyses the strategic development of HK/China manufacturing industries in order to identify the measures necessary to preserve the role of HK for sustaining growth in HK/China manufacturing industries. The historical development of HK manufacturing industries, the economic reformation in China and the inseparable relationship of the two places have been analyzed.

Previous studies in this field have concentrated on Hong Kong investments in China in aggregate. The purpose of this thesis is to take a specific look at the industrial sector in which Hong Kong has historically held international competitive advantages, i.e. its low cost light engineering manufacturing. This thesis investigates the reasons why it has been strategically beneficial for establishing Hong Kong industries with the emerging Chinese industries in the Pearl River Delta (PRD) by relocating HK production on a large scale. The benefits to each region are discussed and a future development model is derived for this sector.

Strategic/operational attributes, i.e. quality, product, technology and logistics aspects, which are important to contribute to the complementary development of the industries in the two places have been studied in details through series of extensive questionnaire surveys and structured interviews. The heavy reliance on low cost approach with poor technology development so far adopted by HK manufacturers has been critically reviewed.

The project concludes that the success of the current HK/China manufacturing industries is the results of the proper economic reformation policy adopted by China at the right time and in the right place. China reoriented its economic policy to "Growth through complete transfer of technology and management know how via foreign direct investment (FDI) with focus on light export-oriented manufacturing industries developed in PRD Special Economic Zone (SEZ) adjacent to HK." HK low cost manufacturing industries relocated to PRD at about the same time to resolve its ever escalating land/labour costs problems.

To sustain growth and competitiveness, the quality experiences, i.e. ISO9000-CQI-TQM, gained in HK through the ISO9000 movement can form a good foundation for China to build up its quality capabilities. To cut costs, HK manufacturers can expand their operations beyond the major cities in PRD to other areas within PRD where logistic support has been improved. HK manufacturers need to migrate from the sole focus in low cost approach to emphasizing more new product and high technology development. Through the better utilization of the China's R&D talents and the commitment from HK manufacturers to gradually upgrade their new product and technology development, HK would be able to preserve its leading role to contribute to the development of HK/China manufacturing industries rather than being overtaken by the Chinese.

CHAPTER I: INTRODUCTION

I. Background

For many years, Hong Kong manufacturing industries have enjoyed the benefits from low cost manufacturing of clothing, consumer electronics and plastic products. These products are basically labor-intensive, low-technology based and low value added. In term of high technology and innovative products development, Hong Kong is well behind the other three little dragons of Asia, i.e. Taiwan, Singapore and South Korea(Yam C.M., 1992). In recent years, Hong Kong low cost manufacturing industries have encountered increasingly keen competition from other developing countries with continuous demand for higher quality products at competitive prices from customers. Due to the many other unfavourable factors such as escalating land and production costs, shortage of labour etc., Hong Kong manufacturing industries have undergone a critical industrial transformation by gradually shifting the low cost production to other developing countries. With the open door policy of China, the majority of the low cost manufacturing industries have been relocated to China. The heavy reliance on China has triggered the need, and really an urgency, to review the development strategies of Hong Kong manufacturing industries for sustaining competitiveness in the global marketplace. With the emerging inseparable relationship with the opening of China and the approaching of 1997 when the sovereignty of Hong Kong will be returned from Britain to China, Hong Kong manufacturing industries, apart from just relocating low cost manufacturing to China, must be capable of exploiting the strengths of Hong Kong, i.e. business and management know how, capital etc., with the vast land, labour and R&D talent resources of China. This project is an empirical, analytical and strategic study of the development of Hong Kong/China manufacturing industries at this transition period.

II. Aim and Objectives

The aim of the project is to analyze the strategic development of HK/China manufacturing industries in order to identify the measures necessary to preserve the important role of HK in the future development of HK/China manufacturing industries, and to sustain growth for the HK/China manufacturing industries towards the 21st century and beyond.

For achieving the project aim, the following objectives are to be accomplished:

1. To study the historical development of HK/China manufacturing industries
2. To analyze the industrial linkage and interaction between HK and China manufacturing industries since China's Open-Door policy in 1978,
3. To identify the attributes, strengths and weaknesses contributing and complementing to the strategic development of the manufacturing industries in the two places,
4. To review the critical operations management aspects, i.e. quality, product, technology and logistics management, of HK/China manufacturing industries with the goal of sustaining growth and competitiveness, increasing productivity and enhancing quality of the HK/China manufacturing industries,
5. To develop strategic recommendations for the current and future development of HK/China manufacturing industries.

The project is profitable to local industry by alerting Hong Kong manufacturers to not only focusing on relocating low cost manufacturing to China but also contributing to the other strategic development alternatives during the transformation of the HK/China manufacturing industries for establishing HK as a commercial, design, manufacturing services, technology and logistic support centre for HK/Pearl River Delta(PRD) region to enhance global competitiveness.

III. Scope

The project covers those issues which are relevant particularly to the strategic development of Hong Kong and China manufacturing industries prior to and after China's Open-Door policy in 1978. China manufacturing industries in this project refers specifically to the manufacturing industries in Pearl River Delta (PRD) region of Southern China with major investment from Hong Kong manufacturers only. The logistic system discussed in chapter 6 refers mainly to the transportation issues between HK/PRD. The project will be conducted and analyzed from the strategic and operational point of view of the HK manufacturers. China's economic reformation, which has the major impact on the transformation of HK/China manufacturing industries, will also be discussed. However, its scope will be limited to the relevant aspects relating to the development of HK/China manufacturing industries only. Section V: "Report Structure and Chapter Summary" will highlight the coverage of the projects in greater details.

IV. Research Methodology

IV.1 Hypothetical Development Model for HK/China Manufacturing Industries

Most developed countries adopt a mix of strategies in developing their manufacturing industries with low cost, high value-added approaches or natural resources industries supplementary to each other (World Bank, 1980). HK/China is one of the very few places which has been emphasizing extensively on low cost approach with limited technology upgrading but maintaining substantial growth in its manufacturing sector for decades. This project studies the historical and current practices of the HK/China low cost manufacturing industries. The strengths and weaknesses of the current approaches will be analyzed versus the opportunities and threats available for HK/China. Alternative strategies for future development will be identified, evaluated and recommended to HK/China manufacturers.

Fig.1 shows the hypothetical model used for detailed analysis in the project.

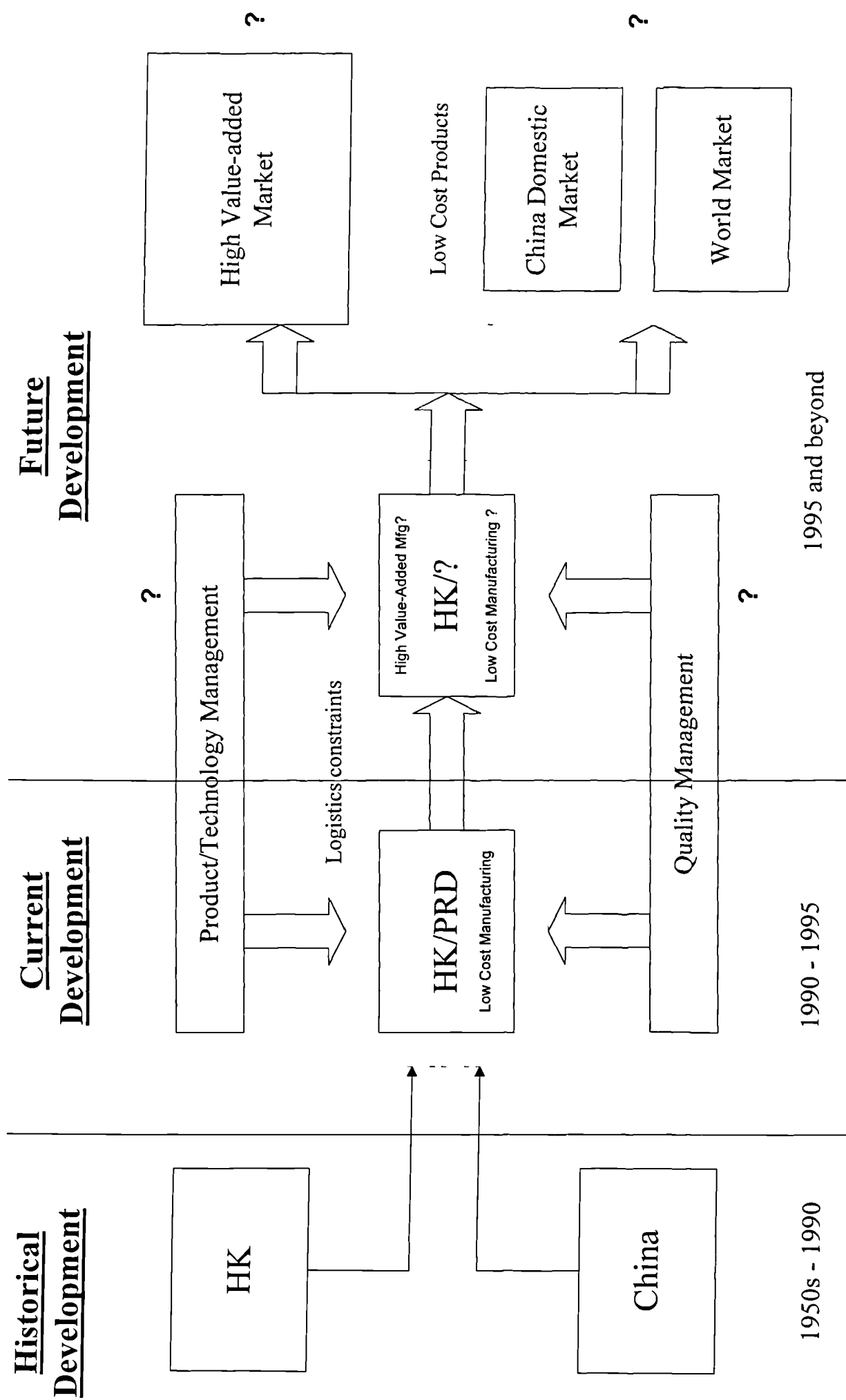


Fig. 1: Hypothetical Development Model for HK/China
Manufacturing Industries

Historical Development: The historical development of HK manufacturing industries and China economic reformation will be studied through extensive literature review. The background and the development of the HK/China manufacturing industries will be analyzed with special focus on the reasons for the success of the current low cost approach.

Current Development: Quality, product/technology and logistics are the basic strategic/operational aspects important to successful manufacturing operations. The current issues of these aspects in HK/China will be reviewed for identifying the strengths and weaknesses as well as the areas for improvement for the industries.

Future Development: Based on the historical development of the two places and the findings in the review of the current quality, product, technology and logistics practices in HK/China, future development strategic alternatives can be generated. Through detailed evaluation and verification, the hypothetical model can then be modified for deriving the recommended future development model for HK/China manufacturers.

IV.2 Sources of Information:

Information required for achieving the dissertation objectives were collected through:

1. Literature review from secondary sources of information such as relevant journals, books, reports, government statistics, trade statistics and other published data;
2. In-depth structured interviews with manufacturers, practitioners, government officials, academics and consultants actively involved in the development of HK/China manufacturing industries;
3. A series of questionnaire surveys conducted between 1990 and 1995.

IV.3 The Surveys

Sample Design

The samples for the survey were drawn by first selecting all firms in the manufacturing category within the most updated Hong Kong Business Directory. Then systematic sampling was used to arrive at a sample of 1000 firms. The sample profile was checked to be roughly in line with the overall industrial profile in Hong Kong. The same approach was used for all the surveys. Structured-questionnaires were mailed to the samples.

Questionnaire Design

The "Quality Management(QM)" issue was included in four surveys conducted in 1990, 1992, 1994 and 1995. The "Product and High Technology Development" aspect was included in the 1992 and the 1995 surveys whereas the "Logistic" question was only tackled in the 1995 survey. The 1995 QM survey also compared quality management practices in Hong Kong and the Pearl River Delta region. Table 1 illustrates the foci of these studies and the sample questionnaires are attached in Appendices.

Content	1990	1992	1994	1995
Quality Management	X	X	X	X
Product Development		X		X
Logistics Problems				X

Table1: Questionnaire surveys conducted in 1990-1995

Details of the questionnaires are as follows:

Quality Management

The level of a firm's commitment to quality management was measured in terms of:-

1. Awareness: of quality management systems/tools/techniques, importance of quality, costs and benefits of quality;

2. Attitudes: of management and employees towards quality; the perceived relationship between business success and commitment to quality;
3. Practices: quality policy; quality techniques; quality emphasis; organisation of quality management; quality regulations enforced; employee training relating to quality; the use of ISO 9000 and Continuous Quality Improvement;
4. Intention: the firm's ultimate quality goal and its future plan in relation to quality.

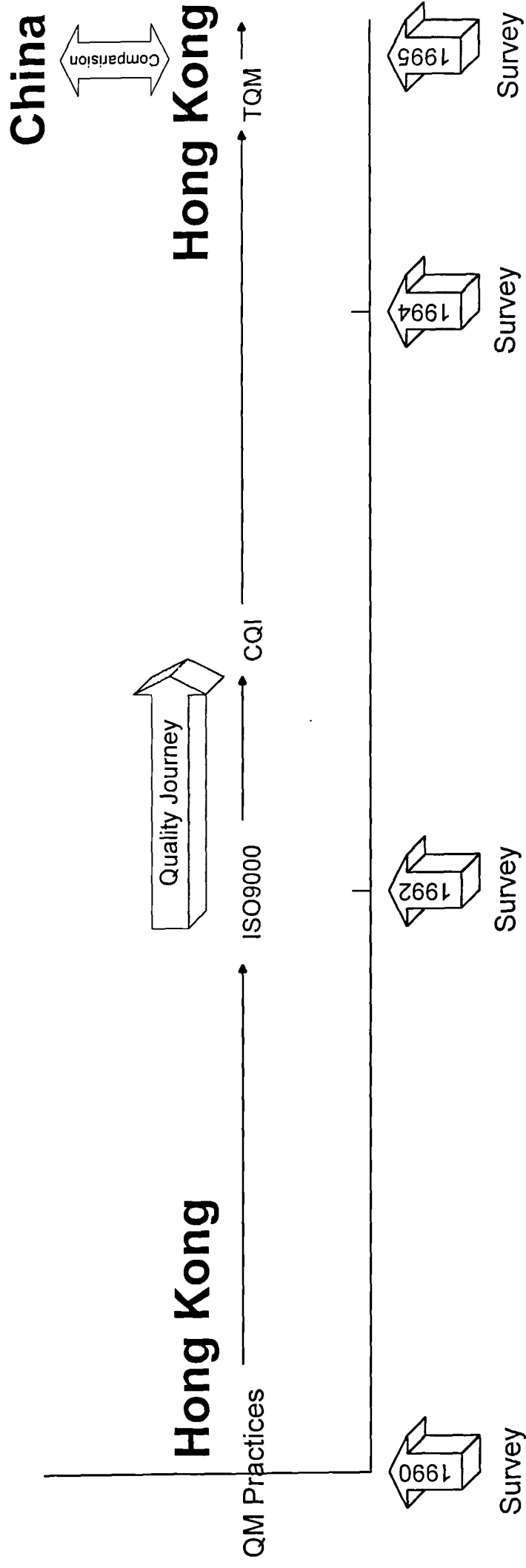
Similar questions were asked in the surveys to permit trend analysis. In the 1995 survey, if the responding company had operations in China, answers pertaining to its China plant were also sought. Thus comparison between the Hong Kong plant and the China plant could be made. Fig. 2 shows the four surveys in graphical form.

Product and Process Development

The firm's product and process development strategies were investigated. Organisation for product and process development within the firm was explored. Questions were also asked to reveal the firm's strategies and practices in relation to the following approaches to product and process development:

1. Proactive approach: whether the firm is active in R&D, keen on product innovations, and concerned about product design.
2. Time-To-Market approach: awareness of this approach; the importance of shortening the time between product definition and product availability; the firm's product development process (phase-by-phase or concurrent).
3. Quality approach (described in the previous section)
4. High technology approach: investment in high technology and effort in R&D; support from Hong Kong government; collaboration with academic institutions and China.

Again similar questions were asked in the 1992 and 1995 surveys in order to obtain valuable trend information. The China situation was tackled in the 1995 survey.



Analysis of Results:

1. Comparing quality movement in HK from 1990 to 1995
2. Comparing quality management practices between Hong Kong and China

Fig 2: Analysis of Quality Management Practices in HK/China Manufacturing Industries

Logistics systems between Hong Kong and the Pearl River Delta (PRD)

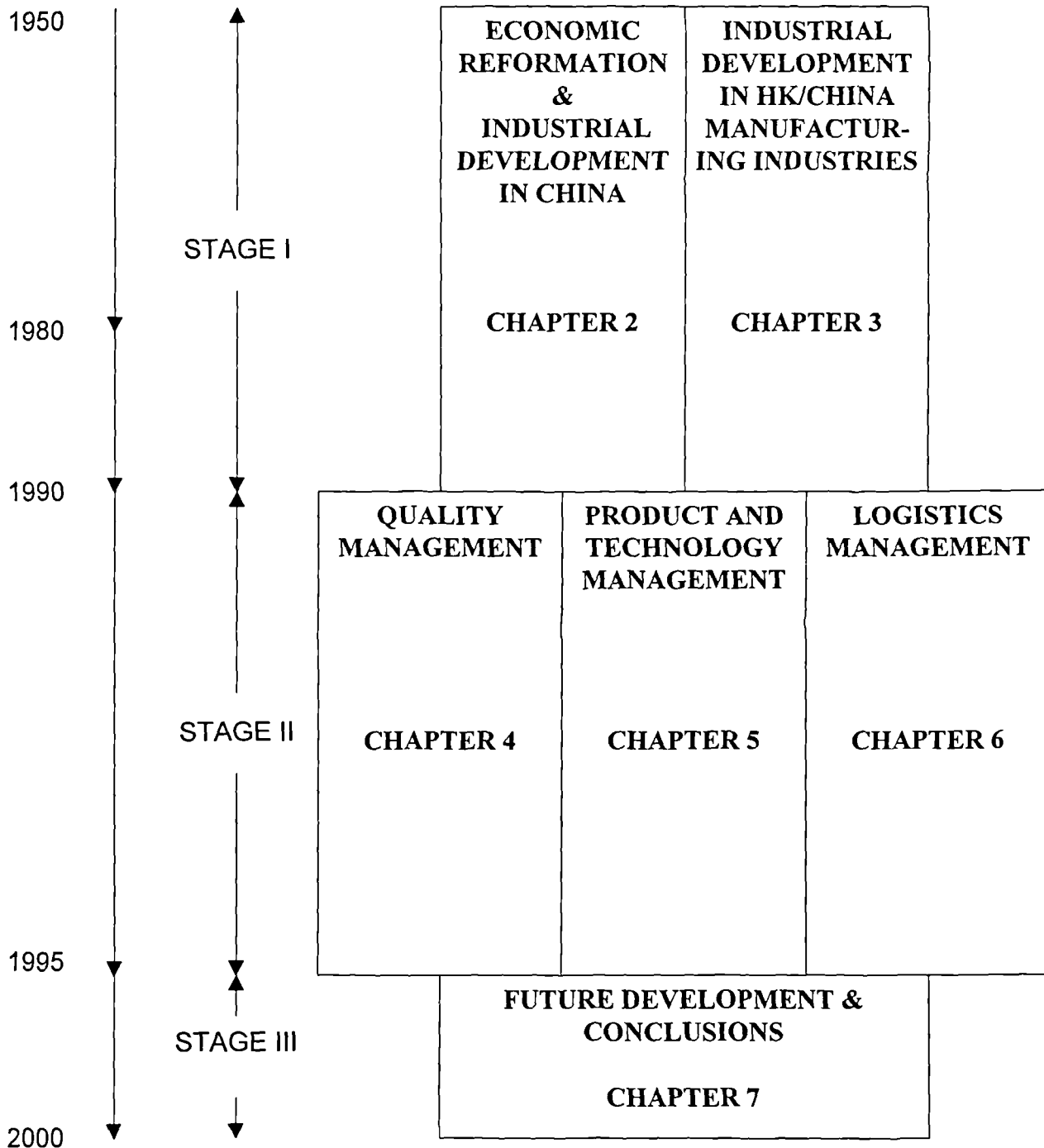
With the rapid expansion of the “outward processing” activities in HK/PRD, where raw material/components are shipped from HK to PRD regions for further processing and the finished products are shipped back to HK for re-export to overseas countries, the impacts of the transportation linkage between HK/PRD on HK manufacturers were investigated. Such impacts were measured in terms of the frequency of travel, the kind of items involved, the routes and mode of transport employed, evaluation of the current transportation system and problems encountered so far.

The response rates of all these surveys are consistently at about or over 10%. This response rate is considered satisfactory in the context of Hong Kong where executives are working long hours and under high pressure. A comparison of the respondent profile with the Hong Kong industry profile as well as the results of the similar survey conducted by the Federation of Hong Kong Industries (FHKI, 1993) suggests that no particular group is under- or over-represented and the analyses are thus representative. Data analysis were conducted with the computer software SPSS (Statistical Package for Social Scientists). As the objectives of the surveys were meant to be informative and descriptive, simple statistical analyses such as frequency distributions, cross-tabulation, Z-test and X^2 tests were found to be adequate.

V. Report Structure & Chapter Summary

The report is structured in the way in which China and Hong Kong industrial developments are described in chronological order. Fig 3. illustrates the report structure in graphical form. The report is subdivided into three stages:

Fig. 3 Project Report Structure



Stage 1: 1950-1980-1990

Stage 1 is basically the historical description of the industrial development of China and Hong Kong. Information at this stage are mainly derived from extensive literature review.

Stage 1 comprises two parts, i.e. chapter 2 and 3.

Chapter 2: Economic Reformation and Industrial Development in China

Chapter 2 describes China industrial development from prior-to-reform era(1950-1978) to open door policy(1978-). Fig. 4 shows China's economic reformation and industrial development in Chronological order and summarizes China's industrial development strategies prior to and during its reformation.

Pre-reform Era(1950s-end 1970s): In the pre-reform era, China took the self-reliance closed economy approach with special emphasis on heavy industries operated by the heavily subsidized State-owned-enterprises(SOEs). There were massive self-financed imports of heavy industrial plants which caused serious problems of economic imbalance.

Reformation(1978-1990s): Since the open door policy in 1978, China's industrial development strategy has been completely reoriented towards--growth through adaptation and diffusion of technology via foreign investment including not only plant and equipment but also knowledge, management skills and practices of a modern society. The focus was shifted from heavy industries to agriculture and export-oriented low-cost labour intensive light manufacturing industries via foreign direct investment. Initially, China liberalized its agricultural sector by introducing the Household Responsibility System(HRS) in 1982. Under the HRS, excessive agricultural output could be sold to the free market. This generated huge increases in productivity and created hundreds of millions of jobs with negligible state investment. Under the 'two-track' and 'gradualism' development policy, i.e. to develop China's "market" economy within the basic framework of socialism on a step-by-step incremental approach, Special Economic Zones were developed in Southern

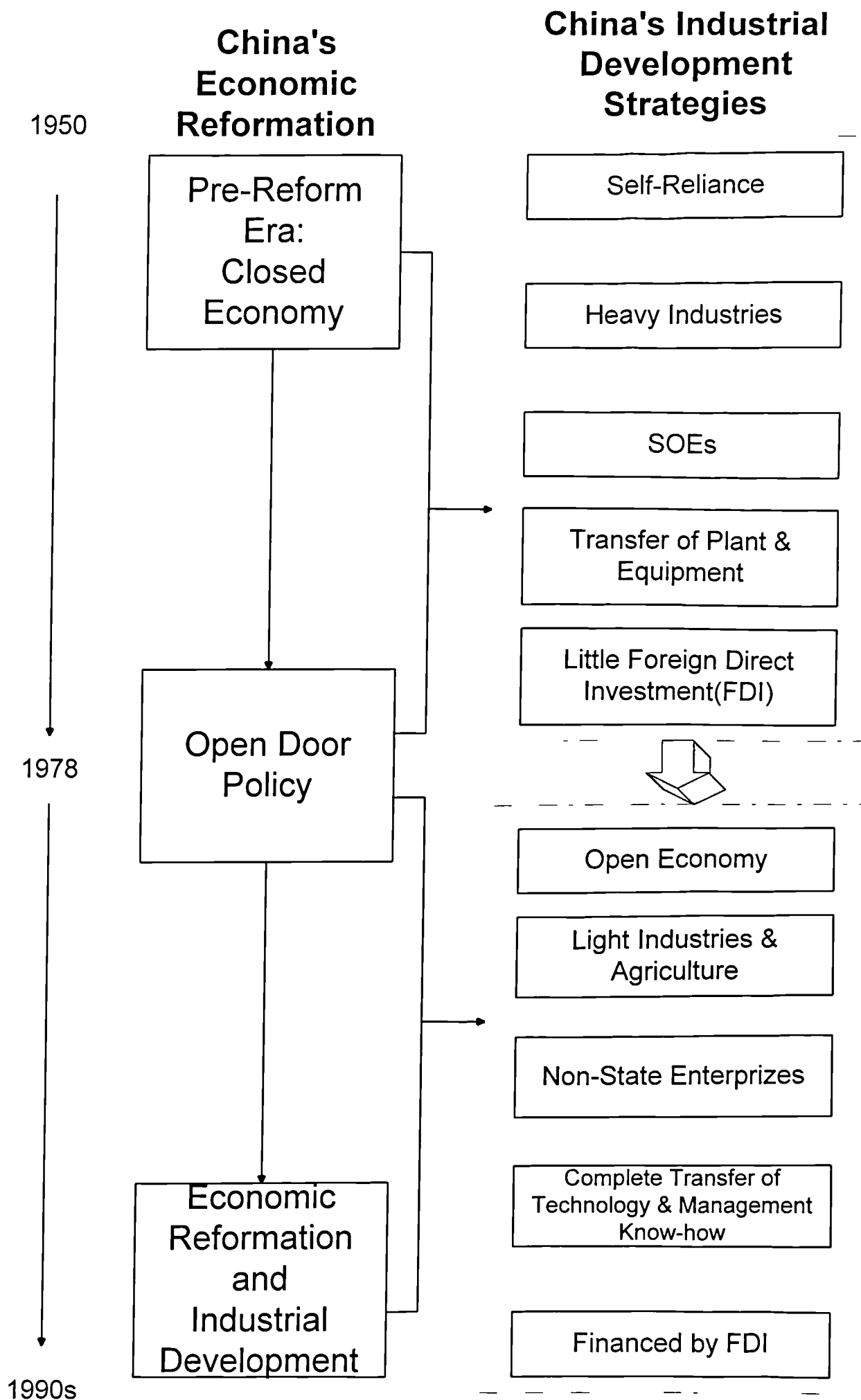


Fig. 4: China's Economic Reformation & Industrial Development Strategies

China adjacent to Hong Kong. Instead of financing the light industries via China's state owned enterprises, the central government decentralized authority to provincial governments for establishing non-state joint venture companies with overseas investors(mainly from HK). With limited capital investment and technical know how, the light and low cost manufacturing industries were developed predominately for export purposes in PRD Region. The light industries also created a lot of jobs for China's over populated work force. Even though the economic reformation of other communist countries are outside the scope of this project, comparison with their experiences may help to highlight the distinct features of China's situation. Table 2 compares China's and Russia's reform:

Table 2: Comparison of Economic Reformation policy and processes in China and Russia

China	Russia
Initial Conditions:	Initial Conditions:
1. 18% heavily subsidized SOEs, small social expenditure	1. 95% SOEs, huge social expenditure
2. Most labour in peasant, vast surplus of agricultural workers	2. Most labour in SOEs lack of surplus labour
3. Underindustrialized	3. Excessive size of heavy industries
4. High household savings	4. Low household savings
Reformation Policy:	Reformation Policy:
1. Gradual, incremental, experimental and regional	1. Big-Bang approach
2. Two-track system with partial liberalization(co-existence of planned and market economics)	2. Rapid and comprehensive changes to market system
3. Preservation of SOEs, Liberalization of non-state sectors	3. Mass privatization of SOEs
Reformation Process:	Reformation Process:
1. Extensive agricultural reform, Household Responsibility System(HRS): excessive output could be sold to free market, increased productivity and employment	1. No surplus workers to develop agriculture and other non-state enterprises(the SOEs workers eager to stay)

2. -Focused on light and labour intensive export industries financed by foreign direct investment(FDI) -Extensive labour movement from agriculture to industries -Regional approach: decentralization of authorities to Special Economic Zones(SEZs)	2. -Mass privatization of SOEs leading to reduction of salary and benefits of SOEs workers -Failed to open the trading systems
3. Manageable liberalization and comparatively better monetary policy	3. Explosive because of deeper structural problems and monetary mismanagement
4. -No severe macroeconomic crisis -No severe external-debt	4. -Macroeconomic crisis -Heavy external debts

(Sachs J. & Woo W.T., 1994 and Naughton B., 1994)

The family ties between mainland and overseas Chinese, particularly Hong Kong, has established strong linkage between Pearl River Delta(PRD) and Hong Kong. Fig. 5 further elaborates China's industrial development process and explains why Hong Kong has come into the picture.

China's Technology Development Policy:(UNIDO, 1992)

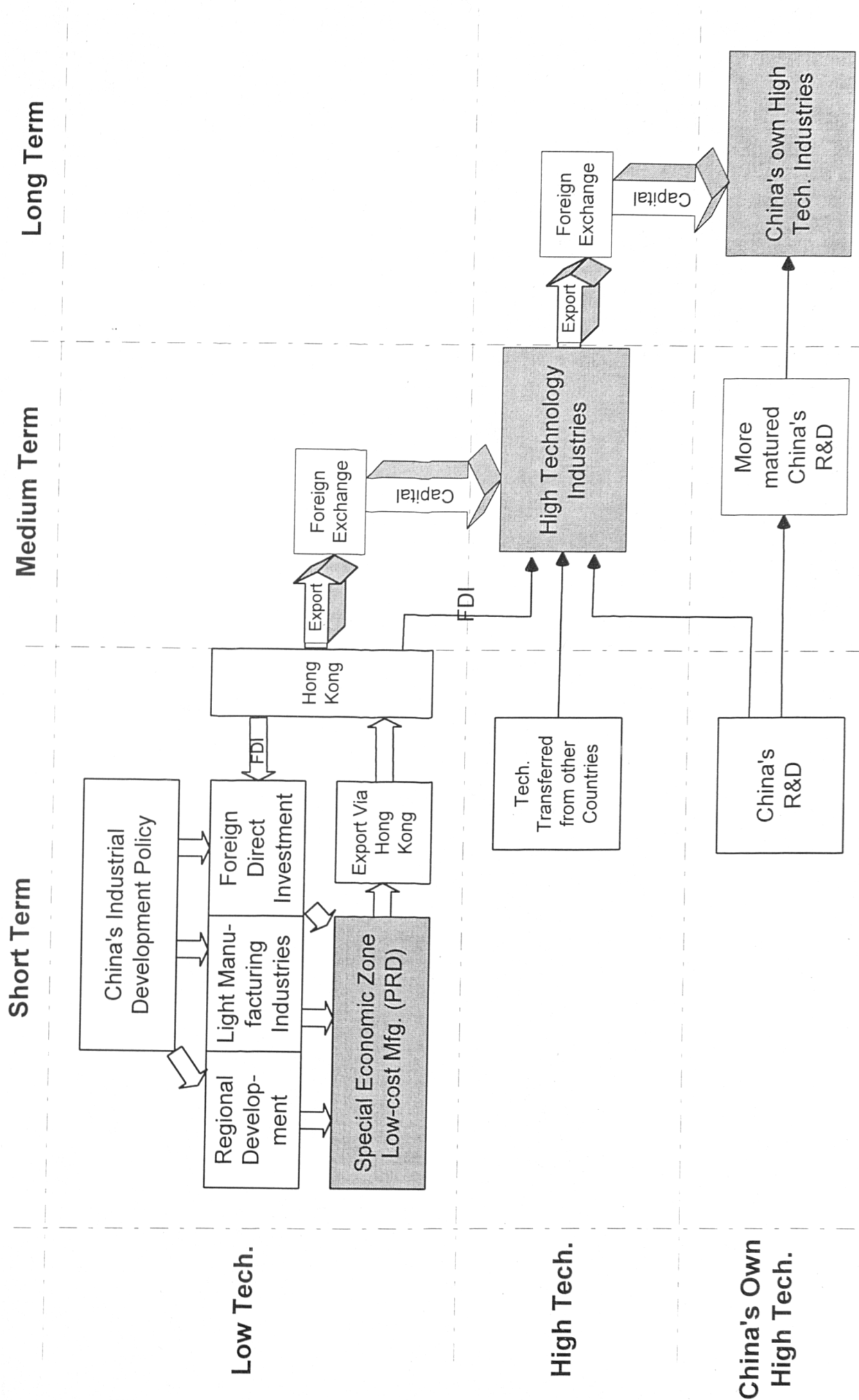
Fig. 6 shows China's Short/Medium/Long terms Technology Development strategies:

1. Short Term: Initially, to concentrate extensively on export-oriented light industries financed by FDI to generate foreign exchange reserve for further development.
2. Medium Term: Gradually, to sustain productivity growth via controllable rate of technology upgrading.
3. Long Term: Ultimately, to attract high-technology export oriented investment for enhancing China's own high technology capability.

Chapter 3: Strategic Development of Hong Kong/China Manufacturing Industries

Chapter 3 begins with the description of the development of HK manufacturing industries since 1950. HK started with light manufacturing industries in the 1950s. In the 1970s HK had become a famous world class manufacturing centre for light industries. In the 1980s,

Fig. 6: China's Technology Development strategies



HK manufacturing industries faced a lot of problems i.e. global trade restrictions, keen competition, shortage of labor and increasing land and labor costs. It was about the same time that China adopted its open door policy, Hong Kong manufacturing industry shifted extensively its labor intensive activities to China. Hong Kong so far has been focusing on low cost manufacturing, in terms of innovative product design and process automation, Hong Kong is well behind its competitors.

The Hong Kong-China Linkage

The HK/PRD linkage activities and their integration in the 1980s are described. Fig. 7 & 8 shows the integration of HK/China manufacturing Industries in the 1980s. The difficulties faced by HK manufacturers in the 1980s/90s are shown in Fig. 9. Outward processing has become the most popular means of operations in which raw materials are shifted from HK to China for further processing which in turn are shifted back to HK for re-export to overseas markets(Fig. 10). Hong Kong has become the most important source of foreign investment and trading partner for China. By end 1980s, about 60% of the total of China's foreign investment came from HK. The Federation of Hong Kong Industries'(FHKI, 1993) survey in 1993 shows that over 80% of its respondents' investment in China were concentrated in the low cost and labour-intensive light industries in Pearl River Delta(PRD) . HK has become the commercial, low-cost technology and management know how transfer centre for China. HK/PRD has been formed as a very important part of China's whole industrial development process. The interdependent economic relationship of HK/PRD has been deepening and complementary to each other for developing it as a single manufacturing entity. With HK's management know how, financial strengths, international marketing connections, extensive logistic network and China's cheap labour, plentiful supply of land and determination to modernize, HK/PRD region will have a good prospect to be developed as an important world class manufacturing region.

Fig. 7 Historical Development of HK/China Manufacturing Industries

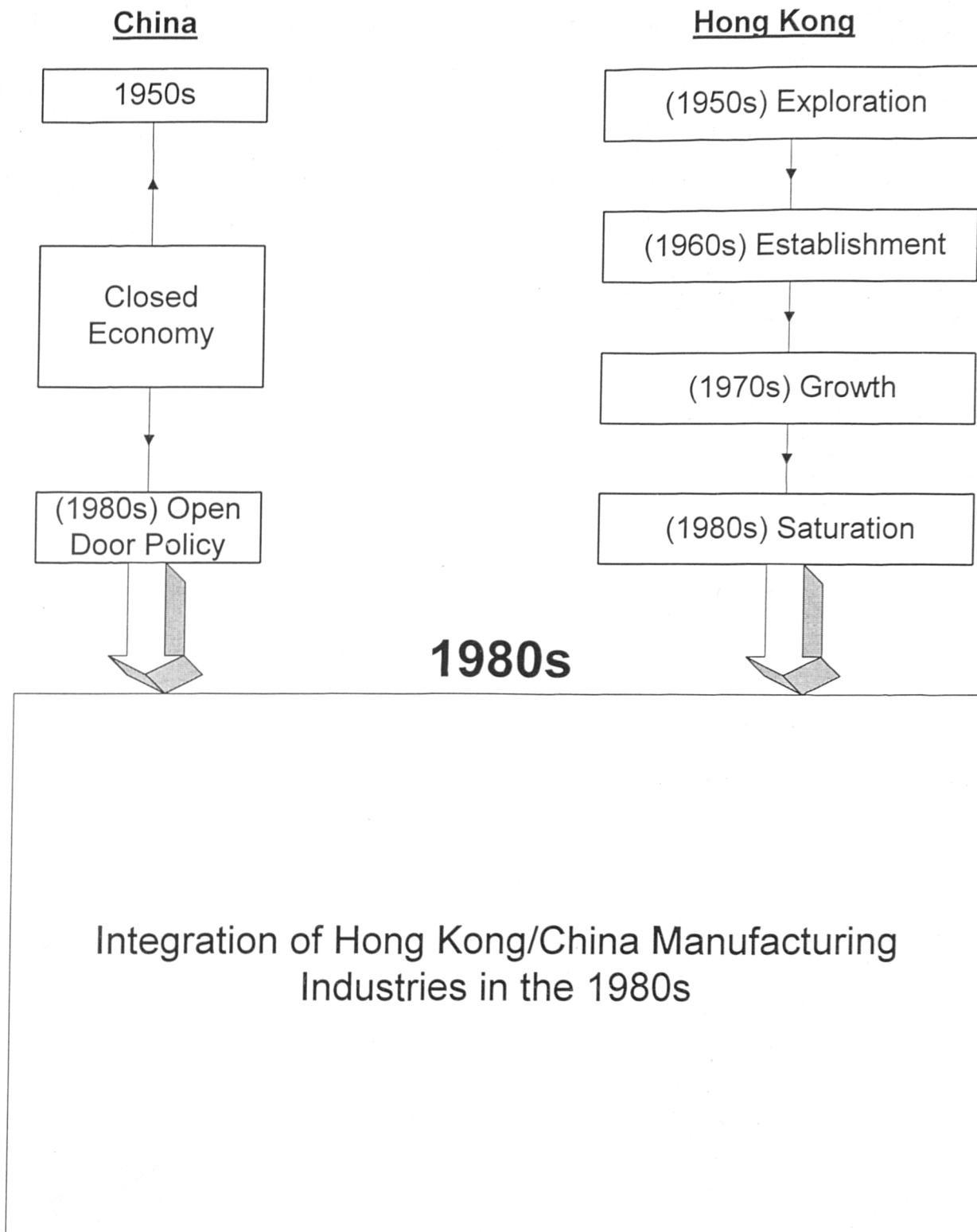


Fig. 8 Integration of HK/China Manufacturing Industries in the 1980s

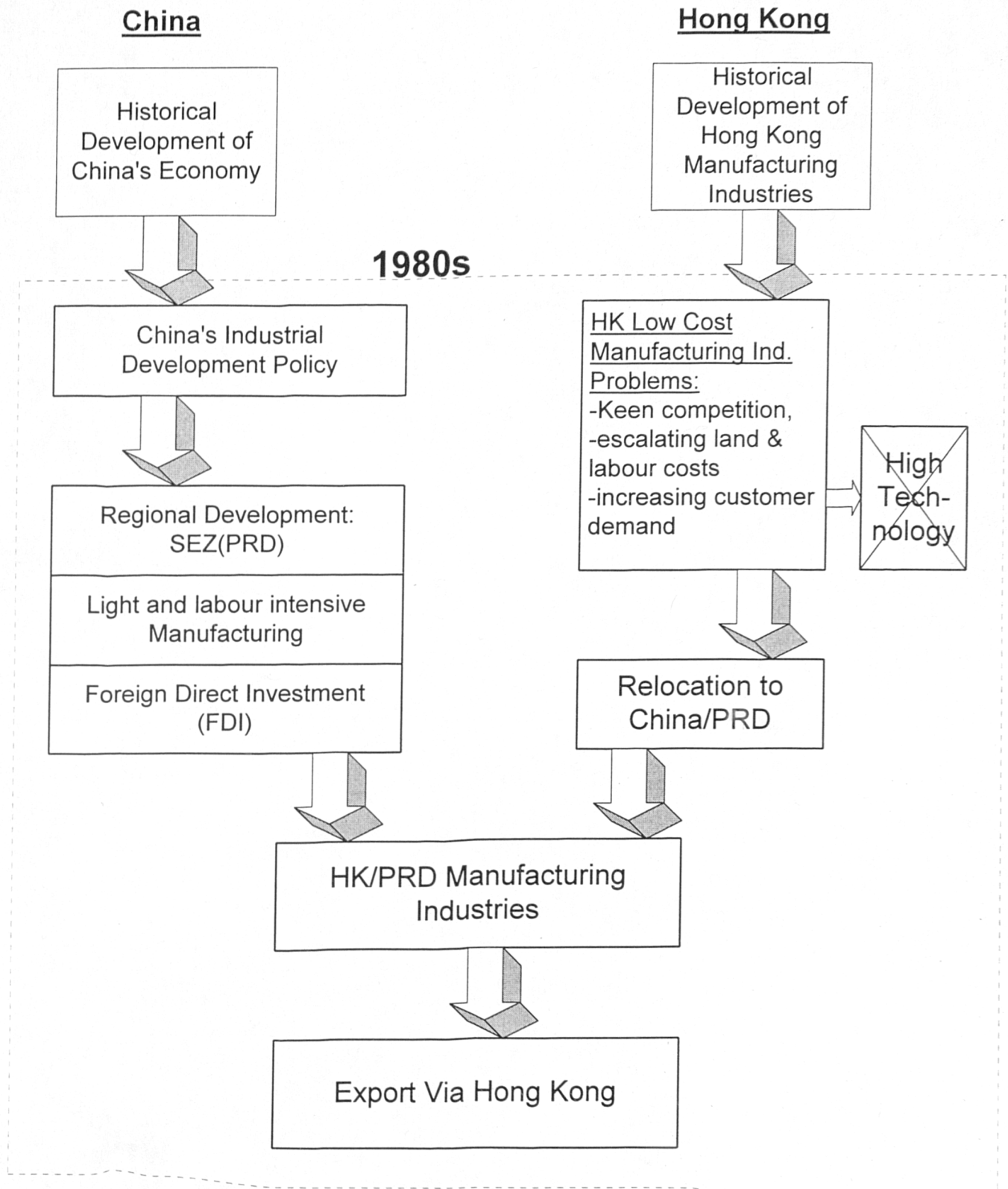


Fig. 9 Difficulties faced by Hong Kong Manufacturing Industries

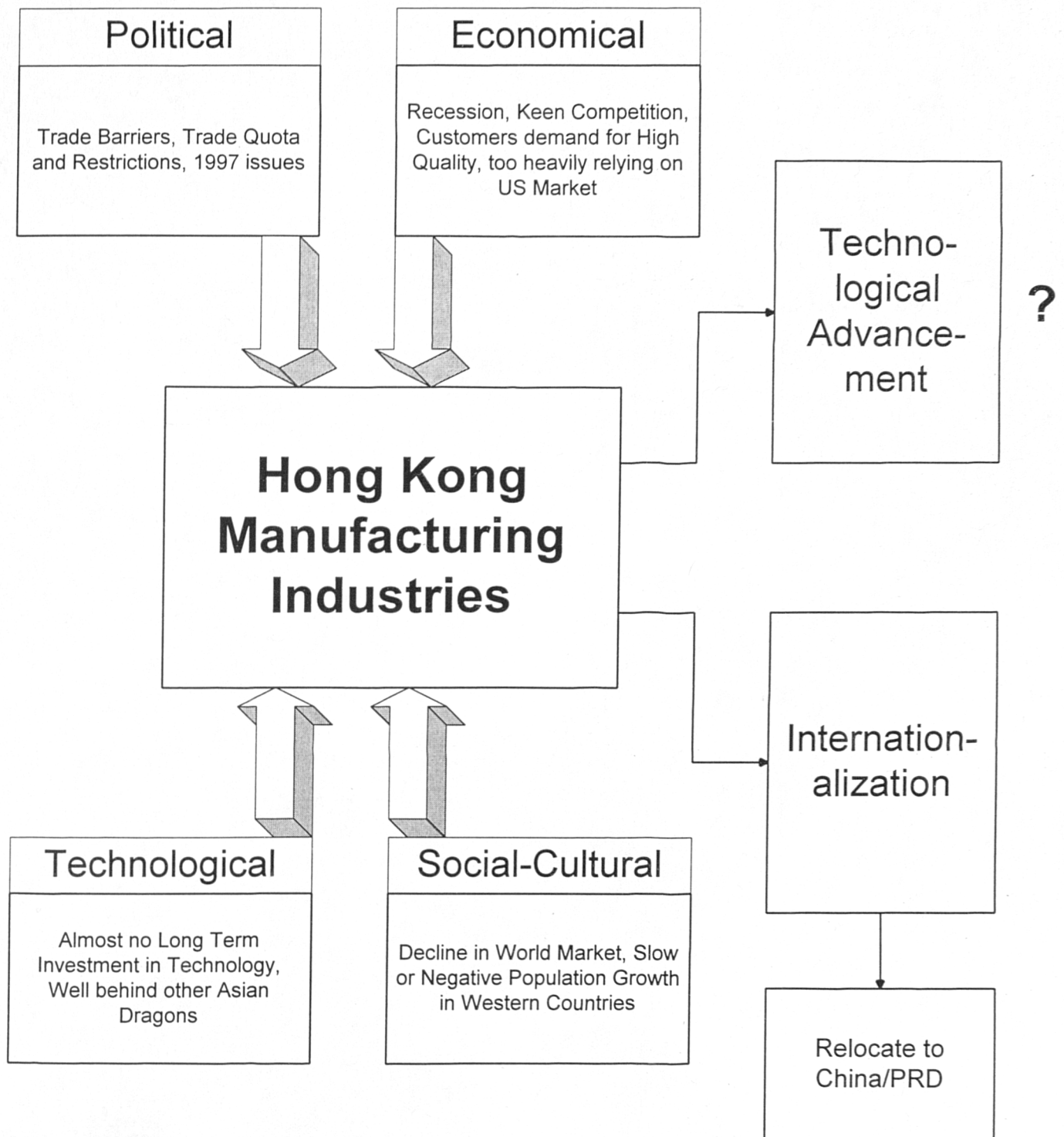
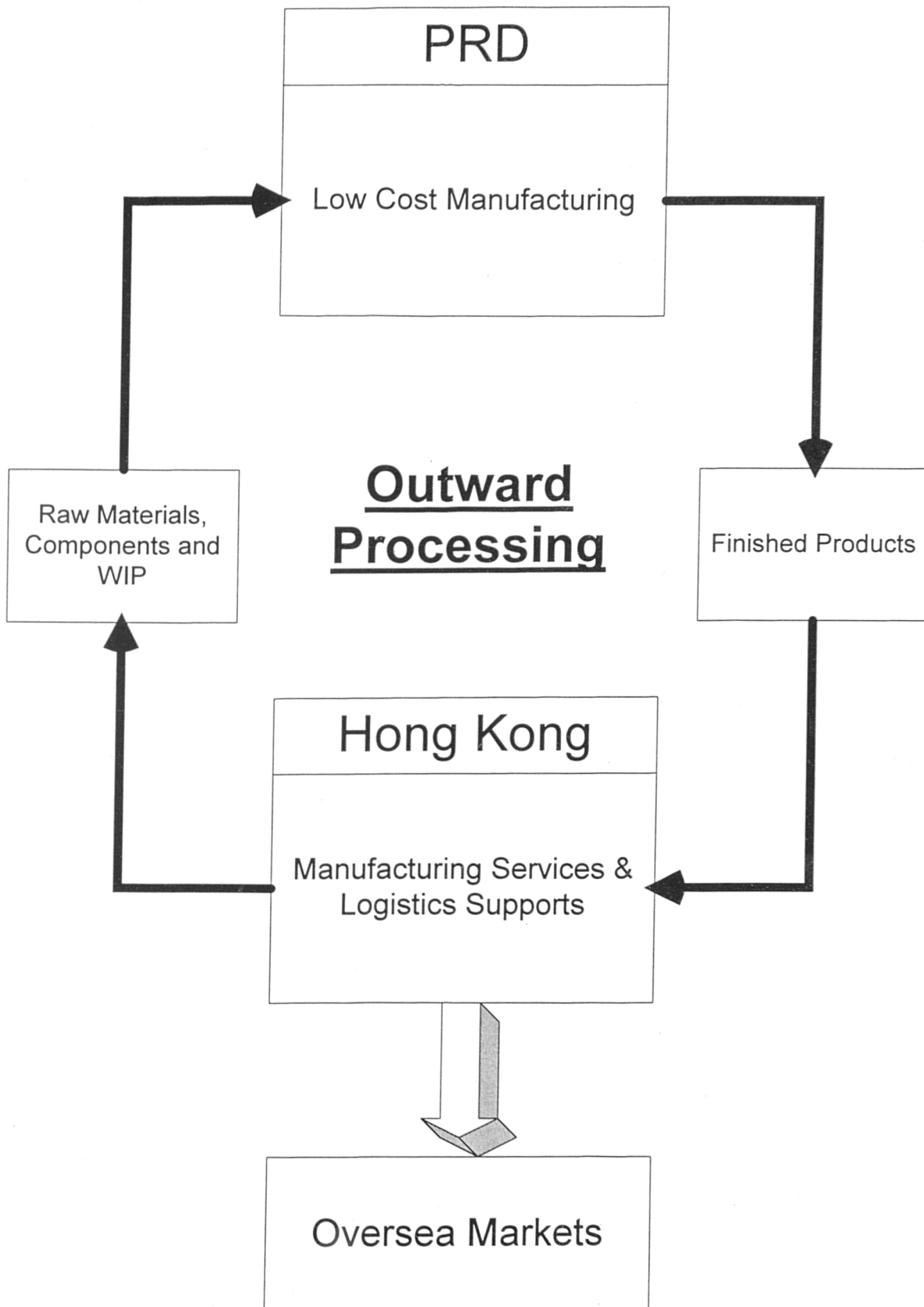


Fig.10 HK/China Manufacturing Industries:
Outward Processing



Stage II:1990-1995

Stage II emphasizes the industrial development strategies which are important to develop HK/PRD as a world class manufacturing region. Three important aspects have been identified for detailed investigation, they are:

Quality management(Chapter 4),

High technology and New Product Development(Chapter 5) and,

Logistic and infrastructure support in the region(Chapter 6)

CHAPTER 4: Quality Management Practices in HK/PRD Manufacturing Industries

The world markets have become extremely competitive. Everybody everywhere is in pursuit of higher quality. Quality and customer focus are so important that nobody can afford to ignore it. There is no exception for HK/PRD. Transferring low cost activities to China does not mean HK manufacturers can escape from the customer focused quality requirements. HK/PRD must make quality products better, faster and cheaper to meet and exceed customer requirements. Adoption of effective quality management strategies will be one of the most crucial factors for success in HK/PRD manufacturing industries. Chapter 4 reviews the quality management practices in HK during the period between 1990-1995. A series of questionnaire sampling surveys and structured interviews were conducted for HK/PRD manufacturers during the last few years.

1990: The survey investigated quality management aspects in 1990. The issues for investigation included: quality awareness, top management commitments and support, quality objectives, documentation, corporate quality policy and manual, effort on prevention, conception of cost of quality, training and the effective use of QC tools etc.

Impact of ISO9000: Comparison of 90/94 surveys investigated the impact of ISO9000 on the awareness and acceptance of quality for HK manufacturers. The support from top

management, the improvement in documentation and training, the changes in the people's attitude, behaviour and values towards quality were also investigated.

CQI as Beyond ISO9000 Quality Strategies: CQI, Continuous Quality Improvement, is a never-ending company-wide programme that reviews and improves quality of company's products and services continuously for achieving 'excellence'. Quality cannot be improved by the imposition of rules and regulations. ISO9000 can at most be used as a good baseline for continuous quality improvement. Comparison of 92/94 surveys investigated the changes of the ultimate quality goal of the ISO9000 certified companies and the proportion of the ISO9000 certified firms that had implemented or planned to implement CQI. The popularity of using CQI as 'beyond ISO9000' quality strategy for achieving TQM in the long run among HK manufacturers was also analyzed.

QM Practices in HK/PRD: 1995 survey showed the most current QM situation in HK/PRD. The achievements of HK's QM practices were reviewed. The awareness of HK/China manufacturers on quality was investigated. The types of quality management training in China, the source of transfer of quality management knowledge and practices to China, the ISO9000 certification process and status as well as the adoption of CQI in HK/China's plants were analyzed.

Chapter 5: New Product and High Technology Development Strategies for HK/China Manufacturing Industries

In response to the shortening product life cycle time, the ever changing customers' requirements for greater product variety and higher product quality, a substantial strategic change is required for HK/PRD manufacturers to migrate from the low cost manufacturing mentality to customer-oriented, high quality and marketing/technology integrative emphasis. Besides transferring low cost activities to China, HK manufacturers should also

review their adaptability to the following two basic approaches for enhancing their competitiveness:

1. High value-added new product development strategy by focusing on proactive, quality and Time-to-Market(TTM) emphasis,
2. Process automation strategy

Following strategic choices have been identified as important alternatives to improve HK/PRD product competitiveness and process technology:

1. Maintain low-cost activities by improving productivity and quality via QM approach,
2. Acquire new skills to provide new features and services of higher value-added products with improved process technology,
3. Become market leader and step into the high value-added, short product cycle and rapidly changing customer demand territory by emphasizing the whole spectrum of quality customer-oriented operations with market research, TTM product design and advanced manufacturing processes.

Chapter 5 analyses the strategic advantages of the above alternatives in details. Two surveys were conducted in 1992 and 1995 respectively to review the product and process management practices in HK/China to support the analysis. The changes of the HK government non-intervention policy in technology development and the improved government support were also reviewed.

Chapter 6: Logistic Systems between Hong Kong and China

Hong Kong, located at the mouth of PRD, is strategically important as an entrepot for China to bridge the rest of the world. With the extensive shift of manufacturing activities from HK to PRD under the outward processing arrangement, the smooth cargo traffic between the two places is vital for the future development of HK/China manufacturing

industries in the region. Chapter 6 reviews the overall transportation system in China with special references to the traffic situation between HK/PRD. A survey was conducted in 1995 among the HK manufacturers to find out the logistics problems of their China operations. The use of the outward processing mode of operations among HK manufacturers in PRD was specifically reviewed. The study analyzed the importance of HK as an logistic support centre for HK/PRD. It also investigated the logistics constraints for HK manufacturing activities to expand beyond the PRD region. The current and future port, airport and traffic system development plans in HK/PRD region were also reported.

Stage 3: Future Development(1995 and Beyond)

Chapter 7: Future Development for HK/China Manufacturing Industries

Chapter 7 describes the future development of HK/PRD manufacturing industries by the future development model(Fig. 32):

Current Practices: The model starts with the current situations of the HK/PRD manufacturing industries.

Future Development:

Quality Management: The QM practices should not only be transferred from HK to China but also be diffused to China so that the operators can initiate quality improvement by themselves in a proactive way. HK manufacturers should act as quality consultants to train the Chinese managers as trainers. They in turn will multiply the QM concepts and practices to everyone in the organization. The “ISO9000-CQI-TQM” approach experienced by the HK manufacturers would be an appropriate quality plan for China.

Product Design and Process Automation: Product design and Process automation are vital for HK/PRD manufacturing industries to develop beyond the low-cost territory. However, with the success of the existing low cost operations, HK manufacturers are not

interested or ready to step into this territory. Many people suggest that, with the relocation of manufacturing activities to China, HK could be established as a service centre. The general industrial development model experienced by many other developed countries does not support this approach. In general, services industries would be more appropriately developed on top of manufacturing to further enhance the value of the manufactured products. Phasing out manufacturing will erode the solid base for service industries. HK should enhance its linkage with China by participating in the high value-added manufacturing. HK should develop its own R&D strength for working jointly with the R&D talents from China. Under the strong entrepreneurship of HK businessmen plus the good HK business connection and marketing information, HK should be able to commercialize the basic research findings of the Chinese or the joint HK/Chinese research teams into innovative commercial products. By contributing more in this hard linkage, HK manufacturers would be able to maintain its leading position on top of the Chinese manufacturers to avoid being overtaken by the Chinese.

Risks and Difficulties: there are substantial risks and difficulties associated with investing in communist society, including political uncertainty, macroeconomics instability, social problems and many other operational difficulties. This is the time of great danger and great opportunity, just as the good and the bad are mixed together in economic reform. Many HK manufacturers had experienced the difficult time of China's closed economic era. They are hesitate to invest in the risky technology based industries under this uncertain environment. In the 1980s when HK faced with a lot of difficulties at its transitional point, HK had decided not to go for high technology. Because of this, HK is now more than 10 years behind the other competitors in the technology journey. In the mid 1990s, HK is again knocking at the door of high technology. If HK is still taking the wait-to-see strategy, HK will never be able to pick up in the technology competition. China will soon be able to

do whatever HK can do right now. HK manufacturing industries will soon be overtaken by the Chinese. HK manufacturers should, on top of their existing “low-cost” approach, commit more positively on advanced technology development to contribute affirmatively to the development of HK/PRD as a world class manufacturing region.

CHAPTER 2: ECONOMIC REFORMATION AND INDUSTRIAL DEVELOPMENT IN CHINA

China's economic reformation is a very complex topic. This chapter reviews the reformation process of China from the pre-open-door policy era up to the situation in the 1990s with the scope limited to the aspects relating to the strategic development of HK/China manufacturing industries. For quick and easy reference, readers can directly jump to section V of the chapter which summarizes the major findings of this chapter.

I. The Era Prior To Open Door Policy In 1978

In the 1950s, China took the self-reliance approach in its foreign economic relations. It relied predominately on Soviet technology, technical support and finance for its industrial development. However, China also recognized the importance of maintaining indirect ties with the capitalist world through Hong Kong. During the Korean War in 1950, China imported most of its strategic support from Hong Kong until the United Nations enforced an economic blockade on China. This trade embargo isolated China from the outside world. After Cultural Revolution in 1976 with more than 25 years closed economy, Hua Guofeng, the Secretary of the Communist Party, started his over-ambitious modernization plan with massive imports of industrial plants. In 1978, Hua signed foreign contracts worth US\$6.4 billion for implementing an ever larger import programme. This massive programme caused serious unbalanced growth problems and excessively high investment in capital-intensive heavy industries. In order to protect the heavy industries projects, the planners fixed the interest rate, exchange rate and prices of many essential materials at below equilibrium levels. Hua's plan soon led to serious deficits in the balance of payment

and was eventually abandoned.(Sung Y.W., 1991)

After the collapse of Hua's over-ambitious approach, China's open door policy in 1978 had completely re-oriented China's industrial development strategy to growth through adaptation and diffusion of technology via foreign investment including not only plant and equipment but also knowledge, management skills and practices of a modern society. Economic reforms through gradual marketization were initiated to improve economic efficiency with the major focus to shift from heavy industry to agriculture and light industries. The most distinct feature in the open-door policy was the willingness to accept foreign investment for relieving constraints in savings and balance of payments. Priority was given to technology imports to modernise existing plants via joint venture with foreign investment. China expanded its exports rapidly to finance technology imports. International trade has thus become an active instrument in China's development strategy. The positive effects of exports on efficiency stimulated intensive growth. Comparing the 5.3% 'exports to total national product ratio' in 1977 to the 19.8% in 1992 shows the rapid expansion of the country's export trades.(China Statistical Yearbook, various issues)

II Characteristics of China's Economic Reformation

Evolution of 'Market' concept in China

China has adopted a 'step-by-step or gradualism' strategy in its reformation process. Reform was first introduced on an experimental and regional basis before adopting it on national scale. This pragmatic approach helps to avoid major economic interruption.(Sachs J. and Woo W.T., 1994, Bell M.W. & others, 1993) At the initial phase of the reform, 'market' was considered by the authorities as a useful 'supplement' to a predominately planned economy and its consistency with the socialist system was yet to be assessed. The

view on 'market' among the Chinese authorities has slowly changed with the progress of the reformation. The Chinese authorities have gradually accepted that the market system is merely an instrument of economic development but not a threatening component to the socialist political system. The market system can be compatible with either capitalist or socialist systems if properly adopted. The role of market has eventually been elevated. The objective of the reform has gradually been evolved to establish a so called 'Socialist Market Economy'. Under this system, market forces will determine the prices and allocation of resources under the macroeconomic influences of the central planning authorities.

The 'Gradualism' and 'Two-track' Intermediate Mechanism

The 'Gradualism' strategy adopted in China's reform was the product of the political compromises between the Stalinists and the reformers. The goal was to develop the Chinese economy as quickly as possible within the basic framework of socialism and the existing political system. Since the driving mechanism behind the 'market' and the 'centrally planned' economic systems are so different, strategies adopted to develop the economic system without changing the basic political framework should naturally be gradual and incremental. Even though the 'Gradualism' may be viewed as the product of political conflicts, there are many distinct advantages of this approach particularly for China's situation. Policies that had higher chances for success were implemented first to build up political support for further reform from the Stalinists. Reforms undertaken on an experimental basis in some localities before adopting them at national level would avoid major disruption, social unrest and unnecessary political conflicts. If policies turned out to be ineffective, they could be modified. The administrative apparatus of the planning system, even with diminishing effectiveness, would continue to be available until a new

system could become effective. This was what the Stalinists would like to see. Furthermore, the driving mechanism behind the 'market system' required the build up of new institutions, the set up of new legal and regulatory frameworks, and the training of personnel etc.-these are all very time consuming. Given the limited experiences and knowledge in China, it would be impractical to carry out all interconnected reforms simultaneously. China used 'intermediate mechanisms' to smooth the transition between the 'planned' and the 'market' systems to avoid major disruptions(Naughton B., 1994). These included: dual-track pricing system to improve allocation of resources, special privileges given to open-economic zones to attract foreign investment in capital and technology, authority given to selected local governments to experiment with the market-oriented legislation and development of the non-state sector whilst maintaining the privileges of the State-Owned-Enterprises (SOEs). The rapid growth of these highly successful policies has strengthened the economy and facilitated the transformation of the SOEs(Chen K., Jefferson G. and Singh I., 1993)

III. Initial Conditions

As mentioned earlier, China adopted the Former Soviet 'command' style of development strategies to guide its economy and industries in 1949. However, unlike the Soviet, the Chinese central authorities only exercised control over the important medium to large-scale heavy industries and left the light manufacturing industries to local authorities. Before 1978, there were frequent tightening and loosening phases, but the degree of control was never as centrally focused as the Former Soviet. Despite the numerous political upheavals during the 30 years prior to the reform, China did not start with a deep macroeconomic instability crisis when reforms commenced. China had sustained an average growth of 6%

per annum since 1949, which was achieved basically by the growth of capital and labour population rather than improvement in productivity. Inflation, government budget and external imbalances were all low compared with other developing countries with favourable income distribution. Table 3 shows the comparison of annual % change of GNP and GNP per Capita for selected countries before China's economic reform in 1978. Prior to reform, China economic growth rate was behind Korea, Singapore, Taiwan and Hong Kong but its initial conditions, in terms of GNP growth rate, were better than many other developing countries like Philippines, India and Myanmar. (Bell W. M. et. al., 1993).

Table 3 : Growth Rates of GNP and GNP Per Capita (1960-1976) (Annual % Change)

Selected Countries	GNP	GNP Per Capita
Korea	9.6	7.3
Singapore	9.5	7.5
Japan	9.1	8.0
Taiwan	9.0	6.2
Hong Kong	8.7	6.4
China	5.7	3.6
Philippines	5.4	2.4
Indonesia	5.2	3.1
India	3.5	1.2
Myanmar	2.9	0.7

Sources: World Bank, World Bank Atlas, 1978

High domestic saving would be one of the important non-inflationary sources of finance for maintaining macroeconomic balance during China's industrial development. Due to the behavioural characteristics of the average Chinese household, China, since its inception of reforms, had enjoyed an estimate of 30-35% domestic saving rate which was very high even by Western industrial country's standards. This voluntary style of saving had empowered the effectiveness of China's monetary policy, i.e. issuance of high interest bonds, to control inflation. On the other hand, China has been very conservative in its

external borrowing policy. China financed its development mainly through foreign investments and exports. The amount of foreign direct investments had increased from below US\$400 millions in 1982 to over US\$11 billions in 1992. Between 1988-1992 Hong Kong alone accounted for over two thirds of the total of direct foreign investments in China.(China Statistical Yearbook, various issues) The majority of this investment was being absorbed by the coastal province of Guangdong, in particular, the Pearl River Delta Region. Unlike the other communist countries in Eastern Europe, China commenced its reform with virtually no external debt. The China debt to GNP ratio in 1980 was only 1.5%(World Bank, World debt tables, various issues). China remained a relatively closed economy prior to and during the early stage of its reforms. The imports and exports to GNP ratio were less than 10% and approximately 20% in 1978 and 1984 respectively. In addition to its strict administrative control of external trade and payments, China was less liable to external disturbances, i.e. recessions in world markets and oil crisis etc.

Even though there was no apparent macroeconomic crisis, prior to reform China also encountered the chronic and fundamental economic difficulties usually faced by communist countries i.e. inefficient resource allocation, concentration on heavy industries investment, distorted pricing system, stagnation of agricultural production, isolation from other countries and slow growth in per capita consumption and shortage of many consumer goods and housing. More importantly, China had made little technological progress in many critical areas.

IV. Economic Reformation and Industrial Development in China

IV.1. Agriculture

China prioritised those industries and sectors where limited central investments would generate rapid growth. The agricultural sector was the first one to liberalize. Until 1979, production decisions on the agricultural sector were planned by high authorities with no or very little consideration of local conditions. Farmer remuneration did not relate to individual productivity. Growth in the agricultural sector in the pre-reform era was barely sufficient to keep up with population growth. In 1982, the Household Responsible System(HRS) was introduced in which households were obliged to produce mandatory quotas for the state with the lands allocated to them for fixed contract periods. The excess output could be sold to the free market or back to the state at negotiated prices. China's peasants had never lost their entrepreneurship. The HRS had channelled them back into a drive for wealth, generating a huge increase in productivity, income and output with negligible state investment. An important consequence of this reform was the generation of hundreds of millions of jobs for ordinary farmers and workers who needed them most. (Bell W. M. and others, 1993).

IV.2. Enterprises Reform

IV.2.1 State-Owned Enterprises(SOEs)

China had adopted a 'two-track' strategy in enterprise reform: i.e. to liberalize the non-state sector while preserving the privileges and subsidies to the SOE sector with partial price liberalization, i.e. coexistence of planned and market pricing systems. Prior to China's reform, the SOEs sector was relatively small with only 18% of the total labour force

compared with 95% in the former Soviet Union. This percentage remained at about the same in 1992(Sachs T. and Woo W.T., 1994). Employment in the SOE sector was heavily subsidized by the State with guaranteed wages, housing, education, medical and retirement benefits etc. State workers preferred to stay in SOEs. At the beginning of the reform, over 70% of the total labour force was in peasant agriculture without State subsidies. The 'two-track' approach encouraged the surplus peasant workers to flow to the newly developed labour-intensive light industries while preserving the privileges to the SOEs workers.

IV.2.2 Non-State Sector

The success of China's reform efforts is attributable in large measure to the impressive growth of the non-state sector during the past decade and a half, in particular the rapid development of the collective-owned Township and Village Enterprises(TVEs) and the Joint Ventures(JV). Following similar strategies to the reformation of the Agricultural sector, China provided flexibility and concessions for developing TVEs with little government intervention and investments. TVEs had initial concessive tax and access to credit from rural credit co-operatives based on performance. TVEs were allowed to sell at market prices, set up direct performance-based wage systems to improve productivity, employ according to need and retain profits for reinvestment. Furthermore, TVEs were not obliged to provide social support services as much as the State-owned Enterprises(SOEs). The key success of the TVEs lay in the high extent of market-forces to drive their development. Since it was a source of revenue to local government, the responsible agency would have a high incentive to ensure its success. Unlike SOEs, no guaranteed budget would be provided to finance failing TVEs and there were no 'captive' markets for their products and inputs. In 1992, there were estimated to be a total of 19 millions TVEs

employing over 100 million workers out of a total rural labour force of about 430 millions. The gross industrial output of TVEs was estimated to be about one-third of the country's total.(Bell M.W. and others, 1993) There had also been a boom in individual and private businesses concentrated mainly in Urban areas. It is estimated that by 1991, there were about 140,000 privately owned companies and 15.3 million individual businesses employing 24.7 million people mostly concentrated in the retail sales outlets.(China Statistical Yearbook, various issues)

IV.2.3 Economic Performance of Non-state and SOE Sectors

Non-State: The rapid growth in China's industrial output since 1978 came mainly from the non-state sector. Table 4 shows the decline of share of the gross industrial output of the SOEs from over 80% in 1978 to less than 50% in 1992:

Table 4: Gross Industrial output by Forms of Enterprises(in %)

Enterprises	1978	1980	1985	1989	1992
SOEs	80.7	78.7	64.9	56.1	48.4
Non-state					
Collectives	19.2	20.7	32.1	35.7	38.2
Individual	-	-	1.8	4.8	6.7
Foreign	-	0.6	1.2	3.4	6.6

Source: China Statistical Yearbook, various issues.

The freedom provided by the government, the concentration on the high demand export market, the focus on the low-cost labour-intensive light manufacturing industries with limited capital investment, the abandonment of the supply of cheap labour and the market orientation approach of the enterprises all contributed to the success of the non-state sector. China's enterprise ownership policy has been trying to retain the predominance of public ownership supplemented by non-state and private ownership. Substantial control has been

decentralized to municipal governments. These lower levels of government viewed enterprises under their jurisdiction as a source of revenue and therefore allowed profit-maximization.

SOEs: Despite the phenomenal growth in China's non-state sector, the performances of SOEs have been very disappointing. The annual TFP (total factor productivity) growth in SOE sector was estimated as about half of that in TVEs (Xiao G., 1993). Overall profitability of the SOE sector has been declining and a large proportion of SOEs are still making losses one and a half decades after the commencement of the reforms. The poor performance of the SOEs was due to their social responsibilities of providing employment, housing, medical and education benefits to their employees, irrespective of the enterprise business performance. The strong government financial back up, the easy access to bank loans and the price protection policies also contributed to the poor performance. Most SOEs remained over-staffed, produced substandard goods and operated with all the fundamental inefficiencies associated with the lack of competition.

The most difficult task ahead for China is to transform SOEs into autonomous, competitive, legal entities with self finance responsibility. Instead of being continuously supported by the State, the inefficient ones are expected to be restructured or to be closed down according to the bankruptcy law. Enterprises are allowed to restructure themselves into limited liability companies by issuing shares. It provides a clear separation between the ownership and management of the enterprises so as to restructure the relationship between government and the enterprises. This restructuring has been boosted by the establishment of stock exchanges in Shanghai and Shenzhen. The share-holding system could be an effective vehicle for restructuring enterprises. Most SOEs could eventually be

converted into share-holding companies with the State as major share holder.

IV.3 Price Liberalization and Privatization

China carefully administered price liberalization to avoid panic hyper-inflation, currency collapse and political disillusionment with economic reform. With the severe shortages of supply in China, sudden price liberation may create economic chaos. High inflation will seriously disturb the country's economic growth and frighten away investments. Prices in China have been liberalized gradually and carefully to ensure, in particular, the prices of basic goods like rice do not become too volatile. During liberalization, inflation was monitored through credit controls and bonds markets. The result was rapid growth with a manageable inflation cycle. The dual-track pricing system introduced in 1984 determined prices by the combination of administrative and market forces. In 1992, the time frame for eliminating the dual-track pricing system was compressed from ten years to five years. The proportion of goods under price control was reduced.

China has been extremely cautious about privatization. If it occurs before the full effect of price reforms, then many firms may become bankrupt because their product prices are set below market level. Price liberalization also requires a network of institutions which can respond to price signals, analyze trends and take appropriate action. Such a network takes years to develop. China needs to create the institutions necessary for proper market operation before undertaking widespread changes of ownership. Premature privatization will also affect the retired workers of the SOEs. It would also cause the collapse of the banking system which has been forced to grant large loans to loss-making SOEs for generations. Finally, an efficient stock market system is required to assess values of companies for privatization, and brokerages to manage stock transactions. China has

delayed the large scale privatization programme until it has successfully liberalized prices, created a national pension system, provided alternative medical and education programmes, undertaken major banking reforms and created working stock markets. Comparing with South Korea and Taiwan, China has opened its stock markets to foreigners and adjusted its currency to close-to-market levels in a much earlier phase of reform.(Overholt W.H., 1993)

IV.4 Legal And Regulatory Framework

To facilitate free competition in the market system, an elaborate legal and regulatory framework is required to set the 'rules of the game'. This is one of the weakest areas in China's reform. Many new laws and regulations have to be created and old ones revised to reflect new requirements of a market economy. Necessary institutions are required to be established to monitor markets and legislature has to be strengthened to arbitrate disputes. In 1992, China speeded up the process on drafting legislation by enacting; the patent law, the copyright law, the tax administration law, the import and export commodities inspection law and the trademark law. The regulations that were promulgated in 1992 including: Regulation on changing the operating mechanism of enterprises, Regulation on the formation of share-holding companies, Implementation of a new accounting system for enterprises, and the Interim Provisions of the Management of the Issuing and Trading of Stocks. Others being drafted or revised include: a central bank law, a general banking law, a securities law, an insurance law, Enterprise and personal income tax laws, a contract law, a real estate law and a company law. In June 1992 the central authority delegated to Shenzhen municipal government the legislative power to formulate and enact new laws to

promote economic reforms. On the regulatory side, the state council set up a Securities Exchange Commission and a Securities Supervision and Administration Commission in 1992.(Bell M.W. and others, 1993)

IV.5 Foreign Investment and Trade

China has developed her export-oriented manufacturing industries via foreign and private investment. The export trades have generated foreign exchange earnings for China to alleviate her people's poverty and to fund the SOE sector. The incentives and rules governing foreign investment and trade were very generous to attract extensive overseas investment and produced enormous gains in exports at negligible cost to government. The incentives to promote foreign trade included: devaluation of renminbi(the Chinese currency), retention of foreign exchange by local government or export enterprises, exemption of tariff to imports used for producing exports and tax holidays etc. China gave priority to small and medium labour-intensive manufacturing industries and has quickly become a global force in the world market in consumer products such as textiles, garments, shoes, toys and electronics. China's trade structure has become increasingly specialized in exports of labour-intensive products. These export-oriented policies have resulted in an explosion of growth in consumer goods production, personal income, exports and foreign exchange earnings. (Overholt W.H., 1993)

IV.5.1 Share of Foreign Trade to China's Overall Economy

At the beginning of reform, China was a closed economy with little trade. In the 1990s, China has far surpassed Japan in the share of her economy devoted to export and import trade. Table 5 shows the Trade/GNP ratios for five major nations in 1990. This measure

has indicated the remarkable openness of China's economy comparing even with Japan. However, the degree of openness, i.e. the trade/GNP ratio, is greatly exaggerated by the drastic underestimation (small estimated GNP) of the size of China's own economy.

Table 5: Trade/GNP 1990: Five Major Nations

	TRADE/GNP %
USSR	5.0
Brazil	11.3
US	16.0
Japan	16.8
China	25.4

(IMF Reports, various issues)

IV.5.2 China's Trade System

Before reform in 1978, all China's foreign trade was routed through the 12 state-owned foreign trade corporations(FTCs). The central government determined the levels of exports/imports and foreign direct investment was kept at very low level. The production sector was isolated from the rest of the world and the balance of payments was controlled through the trade plan. After 1978, decision making and administration of foreign trade has been decentralized to make foreign trade and investment more market oriented. The provincial authorities were allowed to establish their own FTCs. In 1989, the number of FTCs increased to about 4,000 with a progressively reduced degree of mandatory planning from the center. By 1991, the mandatory planned exports and imports reduced to 30% and 20% respectively. Instead of the planned approach, the government used the licensing system to control foreign trade. A number of other new measures i.e. reduction of the number of export commodities subject to quotas, modification of China's tariff system etc., were also introduced to liberalize trade in 1991 in order to conform with the General Agreement on Tariffs and Trade(GATT) or currently called WTO(World Trade Organization) international practices.(China Statistical Yearbook, various issues)

IV.5.3 Foreign Direct Investment(FDI)

Foreign-funded enterprises have become the key vehicles for promoting China's foreign trade. In 1992, there were 13,440 foreign-funded enterprises operating in China.(People's Daily, 1993). China actively encouraged foreign direct investment(FDI) to gain access to modern technology, packaged with capital, management skills and international networking. China also expected that FDI would generate foreign exchange earnings from exporting. Special incentives to encourage the import of 'advanced technology' on preferential terms were also introduced. Chinese authorities differentiated among types of FDI and singled out 'export enterprises' and 'technologically advanced enterprises' for specific encouragement.(Wall D. and Fukasaku K., 1994)

Attracting FDI has been a main objective of the Chinese authorities as part of their policy reforms in the post-1978 period. Table 6 shows that since 1983 China has managed to attract an increasing amount of FDI:

Table 6: FDI in China, 1979-1992(million US\$)

Year	83	84	85	86	87	88	89	90	91	92
FDI	636	1258	1661	1874	2314	3193	3393	3487	4366	11007

(China Statistical Yearbook, various issues)

Table 7: Percentage Distribution of actual FDI by source, 1986 and 1992

Source	1986	1992
OECD total	37.9	14.5
Hong Kong	60.4	70.0
Taiwan	-	9.5

(China Statistical Yearbook, various issues)

The very high FDI figure in 1992 included the sudden increase in foreign investment in China's property market due to the relief of the restriction in foreign investment in this sector. Hong Kong was the main source of FDI for China, Table 7 shows that in 1992, 70% of total FDI inflows in China came from Hong Kong. This heavy investment from

Hong Kong also included the other countries' investment in China via the Hong Kong banking system. FDI inflows in China are heavily concentrated in the coastal regions. In 1992, nearly 90% of actual FDI went to 11 provinces along the coastal regions.(China Statistical Yearbook, various issues)

IV.6 Regional Development and Decentralization

IV.6.1 Special Economic Zones(SEZs)

China used the SEZs regional approach to attract foreign investment and technology which in turn generated foreign exchange through exports for China to finance imports to modernize its economy. The SEZs were not just a vehicle for expanding exports, they had multiple objectives and were the 'window and bridge' for china to deal with the outside world in both inward and outward directions. In addition, the SEZs were also the 'economic laboratories' in which economic policy experiments could be tried out on a geographically restricted basis. SEZs stimulated inflows of capital, technology, management skill and market information. Both foreign and domestic firms were encouraged to use packages of such inflows to produce for both the foreign and domestic markets. There was quick recognition of the benefits of market forces perceived through the windows of the SEZs and travelling over the bridges into the hinterland. More and more areas of China were opened up as windows and bridges, but always on a more restricted basis than in the SEZs.(Wall D. and Fukasaku K., 1994)

Under the SEZs regional policy, preferential treatments including partial tax exemption and holidays, duty-free imports of goods for export production, full retention of foreign funds earned etc. were offered to foreign-funded enterprises. Local authorities in SEZs

were permitted to decide on investment decisions by attracting foreign investment. Providing they obtained funds by taxation or profits, local authorities had the autonomy to decide on their own infrastructure development projects or other investments. China established the first four Special Economic zones(SEZs) in 1979-80 with three of them in Guangdong province(Shenzhen near Hong Kong, Zhuhai near Macao and Shantou) and one in Fujian province(Xiamen near Taiwan). The economic performance of the first four SEZs have been very impressive with the total exports doubled from 1987 to 1991 reaching US\$6.6 billion. The original presumption was to isolate the SEZs, however, the strong performance led to pressures for greater integration with the domestic economy. The SEZs have emerged as the most dynamic growth centre in the country.(Bell W.H. & others, 1993)

IV.6.2 The Experiences of Guangdong

Guangdong has been the fastest growing region since the country's reform. In 1978, Guangdong's economic performance ranked tenth among the 29 provinces with per capita income of Yen313. In 1991, it ranked fifth in the nation with per capita income of Yen2,134. This is not the whole province but the Southern part of Guangdong i.e. the Pearl River Delta contributed to the rapid economic development of the province. It is estimated that the PRD region achieved an average growth rate of over 20% and the three SEZs in the province had achieved a rate of over 30% in the past decade.(Maruya T., 1992) The following selected statistics show Guangdong's export achievement during the reform:

(China Statistical Yearbook, various issues)

Average growth rate from 1978-90	
Exports	: 29.0%
GNP	: 12.4%
Total export	: US\$10.6 billion in 1990
	17% of the country's total
Export/GNP	: 13% in 1978
	34% in 1990
Trade surplus	: 30% of export or
	10% of GNP

The above statistics show the importance of the role of exports in Guangdong.

IV.6.3 Economic Integration between Guangdong and Hong Kong

Hong Kong has been the largest source of foreign investors for Guangdong.(Goodman D.S.G. and Segal G., 1994) Table 8 shows that in 1991 almost 90% of the new contracts in Guangdong came from Hong Kong.

Table 8 Source of Foreign Investment in Guangdong, 1991

	No. of contracted investment
Hong Kong	7623
Macao	326
Taiwan	276
Japan	49
Total	8507

(China Statistical Yearbook, various issues)

Guangdong has been very successful in attracting foreign investment and business connection to the international markets from Hong Kong. The central government intended to use Guangdong as the laboratory for reform for the whole country. Therefore, Guangdong could be consistently more aggressive in reform than other provinces. With the establishment of the Pearl River Delta region(PRD) as an Economic Development Zone in mid-1980s, Guangdong has been designated as a 'comprehensive reform experiment zone'. The region's economy was allowed to further open in many other aspects, including retail price liberalization, finance and trade etc. The central government has intentionally permitted Guangdong to remit less revenue and allowed Guangdong more favourable fiscal freedom. For instance, in its 1988-91 fiscal contract, Guangdong was required to submit Y1.4 billion tax with 9% annual growth. Shanghai was required to submit Y10.5 billion. This provided more financial autonomy to Guangdong to experiment with decentralization and reform. Guangdong was also allowed to proceed with investment

projects beyond the normal authorities of other provincial governments without central approval. The degree of decentralization of authority to lower levels of government in Guangdong has also been much further devolved than in other provinces. This could reduce the undue bureaucratic delays in approving productive investment projects. The success of Guangdong has been the result of the mixture of policies and geographical circumstances.

The regional policies of encouraging provincial initiatives in experimenting with market-related reform has been highly successful in generating strong growth in many coastal provinces. The extent of openness, the low degree of state ownership, the limited government intervention, the retention of fiscal resources in local government and the availability of foreign direct investment for labour intensive export-oriented light industries etc. all contributed to the success. However, in view of the underdeveloped indirect macroeconomic management system, the more autonomous local authorities might severely weaken the central government power in macroeconomic control with adverse implications for maintaining macro-stability.

IV.7 Macroeconomic Management

With the decentralization of authority and autonomy to local government and SOEs, the traditional administrative system of macroeconomic control has become less effective. Since 1978, China has experienced a number of incidents of macroeconomic instability which have tended to become more severe with each cycle. Hence, the primary objective of macroeconomic policy is to maintain a stable environment, by economic and administrative means, for the pursuance of reform and the opening-up policy. The Chinese authorities have tried to rely on indirect instruments to manage the economy by reducing

its role in direct supervision of enterprises. However, indirect instruments like monetary and fiscal policy are only effective if enterprises are faced with tight financial constraint and banks operate competitively with great care of their cost of funds. The reform therefore must include the successful restructuring of the financial institutions. The People's Bank has moved to open market operations by developing inter-bank markets. To strengthen the role of the budget constraint to enterprises, the authorities are taking steps to correct the high subsidy payments. The budget subsidy system has been weakened by the adoption of the contract responsibility system and the introduction of the corporate taxation system. The high subsidy payments are expected to diminish over time. The task of maintaining macroeconomic stability for China is likely to remain one of the key challenges ahead even as the authorities have taken steps to establish a more effective system of macroeconomic management. Despite the many deficiencies in China's institutional framework, by the communist standard, China has taken giant steps in reforming its institutional system.

IV.8. Industrial Development in China

IV.8.1 Industrial Development Strategies in China

Under the full protection of the command economy, most of China's industrial enterprises, especially the SOEs, are ill-equipped to face the transition to the market system. The overall technology level in most industries has remained low with many factories still keeping obsolete technologies. The upgrade of technology in China, in many cases, only means the additions of piecemeal modern equipment to the existing old plant. The Cultural Revolution has seriously diminished the quality and quantity of skilled technical personnel. In view of these inadequacies, China's long-term objectives of industrial policy are to sustain gradual productivity growth via a controllable rate of technology upgrading in

heavy industries with the initial effort concentrated extensively on the consumer goods light industries financed mainly by foreign investment. Most of the consumer goods produced are for export purposes. This risk-averse gradualism approach avoids the large scale privatization of SOEs and the over-rapid dismantling of the existing economic structures during reform. Since the reform in 1978, China has experienced impressive improvement in output gains with rapid growth in foreign investment. The gains in agriculture, the non-state industrial sector and external trade have been very encouraging with a comparatively slow pace of reforms in the SOEs sector.

Industrial dispersion via regional development is also another distinct feature in China's industrial development. The SEZs in the coastal areas have been developed at a much faster pace than inland. The large number of small to medium size firms established in the SEZs are engaged in the manufacture of light consumer goods for export and domestic markets. Enormous amounts of foreign investment from HK have created millions of jobs in small-scale low technology light industries mainly in Guangdong province.

IV.8.2 Technology Strategies in China

The initial export-oriented foreign funded light consumer industries development provides China with the solid industrial base to access high technology manufacturing processes. China's ultimate industrial development aim is to attract high-technology, export-oriented investment. However, there are numerous problems in China's technology journey. The incremental, piecemeal plant upgrading approach adopted causes a mix of equipment at different ages and generations to co-exist in the same plant. A complete reform of technologies and operations is required for most enterprises, which is an expensive move for China. Other difficulties facing China's high technology development are the existing

over 150 million surplus of rural workers and expects at least 50 million more by the end of this century. To cater for this massive supply of labour, the Chinese government has developed rapidly the labour-intensive tertiary industry as well as the rural manufacturing industries hoping to absorb the surplus labour and allow the key SOEs to adopt high technology without depressing the productivity gained. How effective it will be is yet to be assessed.(Hornik R, 1994)

IV.8.3 Manufacturing Industries in China

Manufacturing Environment

In the 1980s, the average industrial output in China grew at over 13% per annum. In the early 1990s, China has been the leading manufacturer in many light industrial products such as textiles, cement and sulphuric acid(World Bank, 1990). In the pre-reform period, China's heavy industry was an important sector. After reform, light industries grew more rapidly because of the growth of consumer demand. The decline of the physical output of heavy industries occurred with the significant increase in output in light industries. However, the unbalanced slow development in infrastructure did not match with the requirements of the rapid development in the light processing industries.

Employment in manufacturing industries

In 1989, there were 121.16 million persons employed in the manufacturing industries representing 22% of China's total labour force. One third of these were employed by the SOEs. Traditionally, labour appointment in SOEs were allocated by the Labour Bureau which led to high labour costs and low productivity. With the introduction of the labour contract system, employers and employees were brought together with free option, this was particularly true for TVEs and JVs. In the late 1980s, wage increases had been

sustained at about 12% per annum in most enterprises. Incentive and bonus systems were introduced in many TVEs and JVs which brought increases in labour productivity. Substantial productivity gains could be obtained by re-allocating technology, investment and labour from SOEs to non-state enterprises.(Jefferson G.H., 1989)

Unemployment

In 1990, there were about 4 million persons looking for jobs in urban areas(Beijing Review, 1990). 80% of the SOEs had 15 to 20% over-staff which was equivalent to about 15-20 million persons needed for reassignment. At present, China has about 1.2 billion population with an annual growth rate of over 1%. Substantial economic growth is required to provide adequate employment for this vast population.

Education and Training

The poor quality of labour is a major obstacle for China's industrial development. The Cultural Revolution disrupted seriously the intellectual education system. In the early 1980s, less than 1% of the total workforce received higher education, 10% had high school education and about 28% of workers were illiterate(Zhang D., 1989). The past education policy in China produced a small number of over-specialized academics specializing in narrow fields not relating to production sectors. Since 1978, the education system has been adjusted according to the social and economic needs. Science and technology have been identified as the motors for future economic growth. Today, upgrading intellectual manpower has been recognized as the basis for modernization of China's economy and social development. It is forecast that the rural industrial employment in China will rise from 34 million to 150 million and the agricultural labour force will drop from 73% of the total to 54% by the year 2000. Over 100 million rural workers will need training in the

coming years.(UNIDO, 1992)

V. Chapter Summary

China did not start with a deep macroeconomic instability crisis when reforms commenced. Inflation, government budget, external debts were all low with favourable income distribution and high household saving. However, China did encounter the chronic and fundamental economic difficulties usually faced by communist countries, in particular, China had vast surplus of rural workers and had made little technological progress in many critical areas. Fig. 4 on page 12 shows that with the open-door policy, China's industrial development strategy has been completely re-oriented from focus on “self-financed heavy industry” to “growth through adaptation and diffusion of technology in labour intensive export-oriented light industries via foreign investment including not only technology but also knowledge, management skills/practices of a modern society.”

The agricultural sector was the first one to liberalize. The introduction of the Household Responsible System(HRS) in 1982 allowed households to sell their excess output to free market. It generated a huge increase in productivity, income and output with negligible state investment and more importantly created hundreds of millions of jobs. China adopted a 'step-by-step or gradualism' strategy to reform its economy on an experimental and regional basis to avoid major economic interruption. China used the Special Economic Zones(SEZs) regional approach with preferential treatments to attract foreign investment and technology. A ‘two-track strategy was adopted to liberalize the non-state enterprises while preserving the privileges and subsidies to the State-Owned-Enterprises(SOEs) with partial price liberalization. The key success of the non-state enterprises, which are mostly

located in the SEZs, lay in the high extent of market-forces to drive their development in the labour-intensive low-cost light manufacturing industries. Employment in the SOE sector was preserved and heavily subsidized by the state with guaranteed wages, housing, education, medical and retirement benefits etc. The surplus peasant workers were attracted to flow to the newly developed labour-intensive light industries in the SEZs. Fig 5 on page 15 summarizes the China's economic reformation in graphical form. Since the reform in 1978, China has experienced impressive improvement in output with rapid growth in foreign investment. The gains in agriculture, the non-state industrial sector and external trade have been very substantial. The SEZs in the coastal areas have been developed much faster than the inland.

The central government intended to use Guangdong as a 'comprehensive reform experiment zone' for the whole country. The PRD of Guangdong has been the fastest growing region since the country's reform. Enormous amounts of foreign investment from HK have created millions of jobs in PRD. The success of PRD has been the results of the mixture of policies and geographical circumstances.

China's industrial enterprises, especially the SOEs, are ill-equipped to face the transition to the market system. The overall technology level in most industries has remained low. The Cultural Revolution has seriously diminished the quality and quantity of skilled technical personnel. China's long-term objectives of industrial policy are to sustain gradual productivity growth via a controllable rate of technology upgrading in heavy industries with the initial effort concentrated extensively on the consumer goods light industries financed mainly by FDI for export.

CHAPTER 3: STRATEGIC DEVELOPMENT OF HONG KONG/CHINA MANUFACTURING INDUSTRIES

I. Historical Development of HK Manufacturing Industries

As mentioned previously, most low cost manufacturing activities in HK have been relocated to PRD, HK is inevitably undergoing a critical transformation from low cost manufacturing to knocking at the door of high value-added, design and service oriented centre.(Peat Marwick Management Consultants Ltd., 1989) This chapter reviews the development of HK manufacturing industries and the industrial integration of the two places.

I.1. Exploration Stage(1950s)

Hong Kong made most of its living from entrepot trade before it started to industrialize in the 1950s. With the upheaval in mainland China after 1949, many refugees came to Hong Kong thus providing cheap labour. They also brought with them capital, technical and management skills, and a conviction to start business. As Hong Kong did not have sufficient raw materials or fuels, it had to resort to light industries which did not require huge capital nor very high-level technology. With the laissez-faire policy adopted by the HK government, industrialists felt encouraged to start business in the colony without government intervention. Capital flowed in since there was no foreign exchange control and there was a lack of political stability in South East Asia. Coupled with cheap labor and low tax, Hong Kong began to industrialize in the 1950s. During the 'exploration stage', i.e. the 1950's, the economic and technological environments were immature in Hong Kong. The light industries flourished most because nearly all the raw materials (e.g. cotton) were

tax-free. Besides, light industries could give quick returns. The social and political environments were favourable because of the vast supply of cheap labour and the absence of trade barriers.(Yam C.M., et. al., 1993b, 1994a)

I.2 Establishment Stage(1960s)

In the 'establishment stage', i.e. the 1960s, the social and political environments were steady and the economic and technological environments had been improved significantly. As a result, there was a great advancement in productivity and quality.

I.3 Growth Stage(1970s)

The mid 1970's and early 1980's were the golden days for HK manufacturing industries. There was a rapid growth in the number of factories, employees, export quantities and values. In the late 1970s, HK had become a famous world class manufacturing centre for clothing, consumer electronics and plastics products. However, its development was still focused on light industries with limited investment in technology advancement.

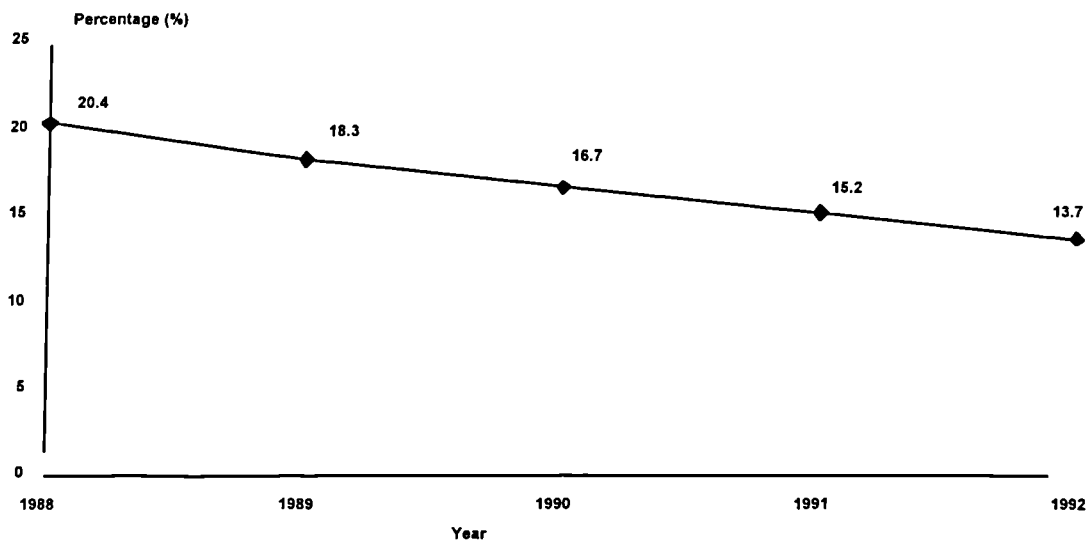
I.4 Saturation Stage(1980s)

In the mid 1980's, Hong Kong manufacturing industries went through their 'saturation stage' with relatively unfavourable political, social and economical environments such as global trade restrictions, rising protectionism, shortage of labour, increasing land and labour costs. Moreover, the 1997 issue, i.e. the return of the sovereignty of Hong Kong to the Chinese Government further hindered the long term investment in sophisticated technologies and advanced manufacturing systems.

I.5 Transition Stage(1990s)

In the 1990s, Hong Kong manufacturing industries have encountered keen competition from other developing countries with escalating land/production costs, and shortage of labour, etc. Hong Kong manufacturing industries have extensively relocated to the Pearl River Delta region of Southern China. Since 1987, the wholesale and retail sector in Hong Kong has overtaken manufacturing industries to become the largest contributor to total GDP in Hong Kong. In fact, as shown in Fig 11, the contribution to GDP by manufacturing industries decreased gradually through 1988 to 1992.

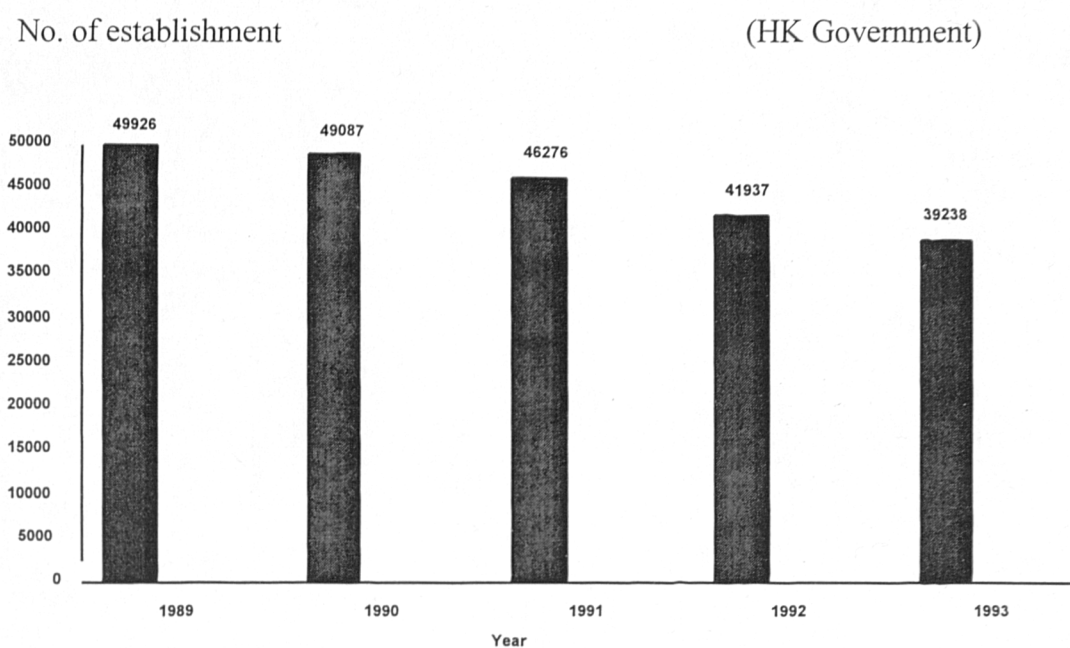
Fig 11: Contribution to GDP by Manufacturing Industries for 1988-92 in Hong Kong



(Industry Department, various issues)

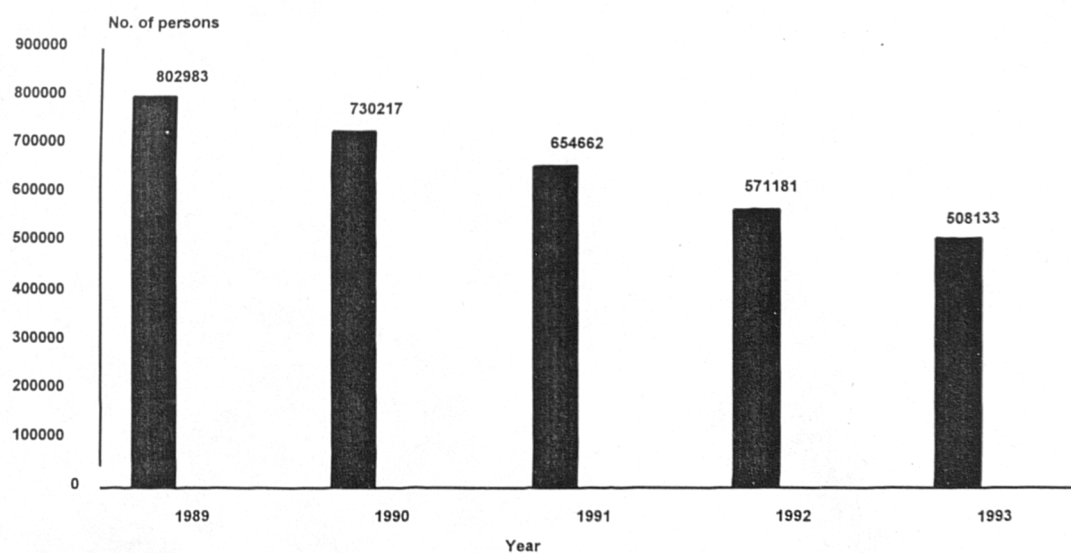
Rising wages and rents are forcing manufacturers of low added-value and labour-intensive products to move their production to developing countries.(Industry Department, 1990-91)

Fig 12: Number of Establishments in Manufacturing Sector(1989-93) in Hong Kong



Figs. 12 & 13 show the decline in the number of establishments and the number of employees engaged in the manufacturing sector between 1989-1993.

Fig13: Number of Employees Engaged in Manufacturing Sector(1989-93) in Hong Kong



(Hong Kong Government, Annual Reports, various issues)

The keen competition in the Pacific Rim has also pressurised Hong Kong manufacturers to produce goods and services of high added-value. For instance, the governments in Taiwan and Korea motivate their industries shifting towards high technology business development by offering taxation or other financial incentives. Consequently, the high-technology computer industry and the car industry have gradually become part of the major manufacturing industries in Taiwan and Korea. Due to the HK Government's 'non-intervening' industrial policy, HK manufacturers do not have similar support.(OECD,91)

II. Strategic Analysis of Hong Kong Manufacturing Industries

II.1 External Driving Forces to the Transformation of HK Manufacturing Industries

Political: There are enormous external threats to the HK Manufacturing Industries. For example, the free world trade of HK largest export i.e. the textile and clothing products, is being eroded by increasing trade barriers like MFA(Multi-Fibre Agreement) and other protectionism measures in USA, EU(European Union) etc. The 1997 issue, to a certain extent, has influenced both overseas and local manufacturers to slow down their investment in upgrading manufacturing technologies in HK.

Economic: Economic recession in USA and EU have great impact on HK. Other developing countries have definite cost advantages over HK especially in the high-volume-low-value-added items. The reform of China, however, provides good opportunities for HK Manufacturers not only to survive but even to expand their business extensively. Moreover, China's domestic market, because of its huge population and ever increasing purchasing power, has created great potential for HK companies to penetrate the 1.2 billion population consumer market. A lot of successful

cases have been reported of HK companies setting up retail outlets in the PRD and other cities like Beijing, Shanghai etc.(HKTDC, 1991)

Technological: Due to the lack of government support and the political uncertainty, HK is well behind its competitors in R&D, product and process development. Manufacturers hesitate to invest in new technology.(Albert M.S. & Taylor D.F., 1989) HK, however, possesses advanced information technology, with extensive and efficient communication networks linking to all business sectors over the world. With this advantage, HK can enhance its competitiveness by 'quick response to market'. Most consumer products businesses like fashion and toys always demand timely response to consumer tastes as well as short development and delivery time. For the same reasons, many global clothing businesses like JC Penny, Macy, Queele, Mark & Spencers etc. have chosen HK as their Far East regional head quarters.

Socio-cultural: The customer taste nowadays changes from day to day. It is really a difficult task to maintain the consumer preference in time especially for fashionable and short-cycle time products like clothing and consumer electronic products. Most of Hong Kong's major export markets, in particular USA and EU countries, suffer from a very slow or even negative population growth. This causes the long term decline in market demand. However, this decline will probably be overcome or compensated by the fast expansion of the consumer market in China as mentioned earlier.

II.2 Strategic Internal Analysis of HK Manufacturing Industries

Manufacturing Capability: Many Hong Kong Manufacturing companies have developed the ability of producing world class products. Hong Kong, with its accumulated experience and know-how, is able to operate efficiently and effectively.

The high quality image has also been established for many years in certain clusters of industries in Hong Kong, in particular, textile & clothing, watch & clock as well as consumer electronic products. The 'Made in Hong Kong' label is often accepted as a quality symbol. In fact, many world class fashion designers are ordering clothing of their brand names from HK. These clusters of industries have contributed significantly to the competitive advantages of Hong Kong. However, investment in new technology in recent years is not apparent. In addition to the historical short-term business attitude, the 1997 issue as mentioned earlier is also another hurdle in the investment of enhancing manufacturing capability. This will weaken the competitiveness of industries.

Supporting Industries: Michael E. Porter has pointed out that 'Nations succeed not in isolated industries, however, but in clusters of industries connected through vertical and horizontal relationships. A nation's economy contains a mix of clusters, whose makeup and sources of competitive advantage(or disadvantage) reflect the state of the economy's development.'(Porter M.E., 1990) Supporting industries are well established in Hong Kong. For example, the local textile industry produces half of the total fabric consumption for Hong Kong Clothing Industry. Therefore, the stable supply of material can be assured and transportation costs can be reduced. The availability of a wide variety of other clothing accessories such as zips, labels, buttons, threads and non-standard trims in Hong Kong, moreover, are beneficial to the fashionable clothing production. These co-ordinated activities in the value chain of the clusters of industries are very supportive to developing the 'quick response to market' strategy in the Hong Kong Clothing Industry with short delivery time.

Manpower Development: Hong Kong has a well-established training system for both technical and managerial personnel in manufacturing industries. The Universities offer degree courses in different disciplines for engineers and managers while the Technical Colleges and Institutes provide training for technicians. In addition, there are a number of training centres organized by the Vocational Training Council to provide training for operators and craftsmen in different manufacturing industries. However, the career aspirations of Hong Kong's young school leavers towards service industries rather than manufacturing, will create problems in the manpower supply in manufacturing in Hong Kong. It is also noted that, in recent years, the working population in the manufacturing industries is ageing.

Trade Quota and Trade Restriction: In Textile and Clothing industries, some of the major items such as men's shirts, trousers, jeans and knitwear etc., Hong Kong is so far the world's largest manufacturer. Many textile and clothing manufacturers hold a substantial number of trading quota to major importing countries. This enables the industries to maintain a stable share in the market. However, this quota system also hampers the industries by imposing quantitative restrictions on growth and expansion.

New Technology: The adoption of both hard and soft new technology by Hong Kong Manufacturing industries is below par. The pace of automation is the slowest among competitors. This is due to the 1997 issue and the lack of government incentive such as tax reduction for high technology investment. Manufacturers are reluctant to apply advanced soft technologies such as computerized management systems etc.

Market: Hong Kong relies too heavily on the USA consumer market. For instance, about 50% of HK domestic clothing products are exported to the USA. There is a high

risk of such over-concentration that any set back in the economic and/or social situation in the USA market or any trade restrictions imposed by the US government will bring a drastic impact on the HK Clothing Industry.

(Yam C.M., et. al., 1993b)

II.3 Strategic Alternatives for Hong Kong Manufacturing Industries

Internationalization: This is one of the strategies that many large HK manufacturing firms adopted to reinforce their competitiveness(Lasserre P. and Putti J., 1986). With investment in low cost countries, such as China, Bangladesh and Sri-Lanka etc., the share of the low-priced market can be maintained. Moreover, it can obtain trade quotas in these countries.

Product Diversification: In order to minimise the impact of protectionism, Hong Kong manufacturers try to develop and produce non-quota items, for example the silk products in the clothing industry. In recent years, there has been a relatively high growth rate in the non-quota sector. Improvement in the design and quality of products in order to penetrate into the high-price high-quality market becomes a very important strategy for Hong Kong.

Market Diversification: It is also risky to over-concentrate the business in a few markets. In recent years, Hong Kong Industries have put a lot of effort in to diversifying the market such as the opening-up of Japanese high-price markets and Middle East low-price markets, and the development of retail business in local and China markets.

Flexibility: This refers to the ability to meet and adapt to different kinds of customer requirements. Such ability has been the result of the accumulation of manufacturing

skills, experience, marketing knowledge, flexible manufacturing technologies, efficient and effective material supply networks etc. The abilities to cope with the small order quantity, frequent change requirement and short delivery lead time are vital in the global competitive market. Hong Kong is strong in many of these aspects except technology development.

Quick response to market: In addition to 'Cost' and 'Quality', 'Time' is another wide spread order-winning manufacturing strategy. 'Time' refers to the quick response time to market needs. It is particularly important in the fashionable sector. The Hong Kong clothing manufacturers are well aware of this strategy. Some of them have emphasised shortening the development time of new products by 'Time-to-market' approach through concurrent engineering. To achieve this goal, some manufacturers are on one hand utilizing advanced computer technologies for design and manufacturing, and on the other hand establishing cross-functional organizations, such as independent concurrent product development teams.

III. The Development Model For Hong Kong Manufacturing Industries

Fig.14 describes the strategic development model of Hong Kong manufacturing industries. After more than 40 years' development, the Hong Kong manufacturing industries have reached a critical transformation stage. In the 'transition stage', Hong Kong manufacturers have to make strategic decisions for their future. Out of the strategic choices mentioned previously, the two more important alternatives that manufacturers should seriously consider are the 'Technological Advancement', i.e. searching for new technology to maintain competitiveness, and the 'Internationalization' i.e. looking for new favourable

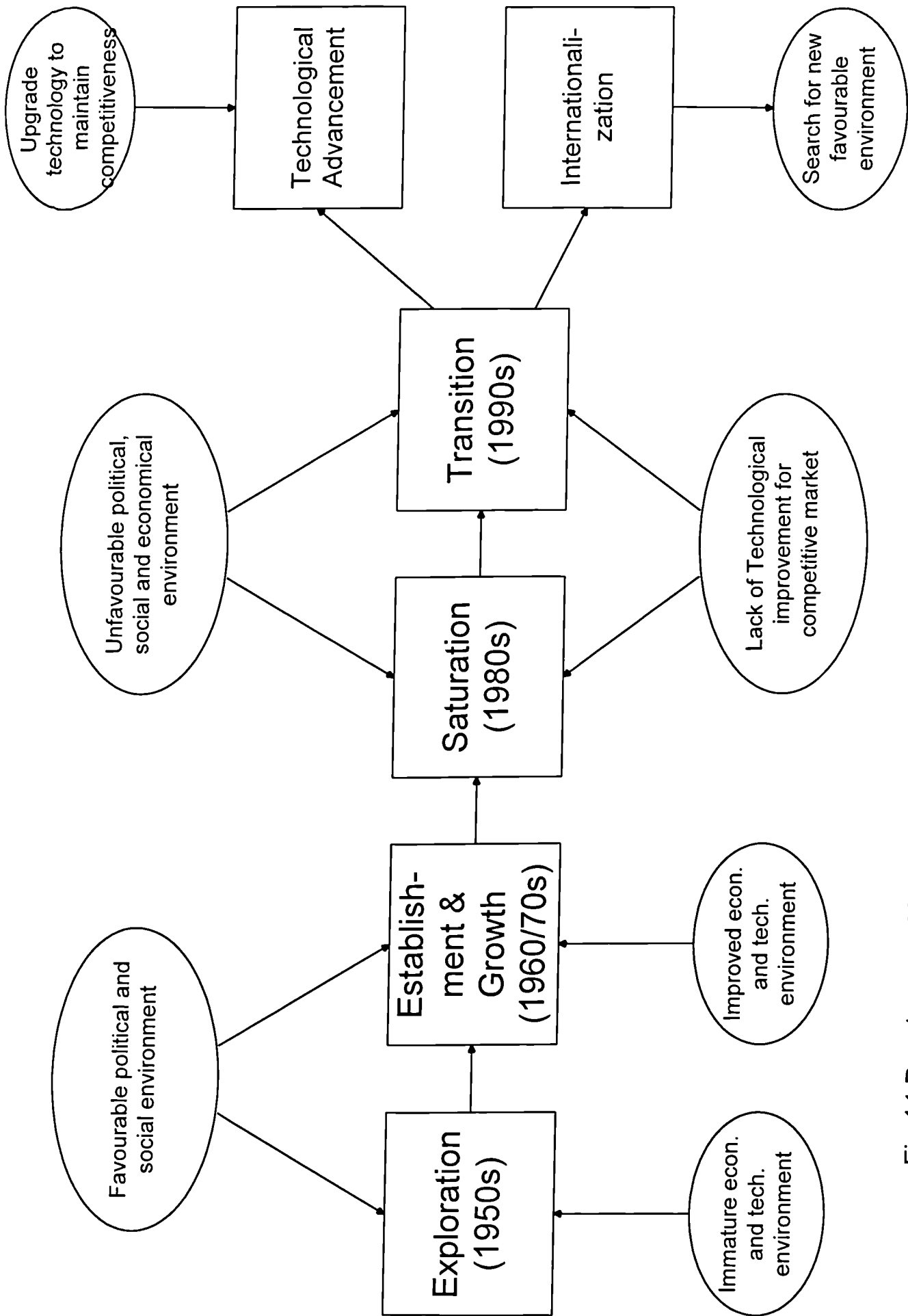


Fig.14 Development Model of Hong Kong Manufacturing Industries

environments in foreign countries. The 'Internationalization', especially in linking with China, is now the wide spread strategy adopted by HK manufacturers.(FHKI, 1991.)

IV. The HK/China Industrial Integration

IV.1 Trades between Hong Kong/China

Table 9 and 10 summarize the shares of Hong Kong's import from and export to China respectively. Obviously, Hong Kong's total imports from China have increased steadily in recent years. However, it is found that the retained imports dropped significantly due to the more and more important entrepot role of Hong Kong for China. In fact, most imports from China are for re-export purposes. Hong Kong's total exports to China have increased gradually in recent years. This is because both the domestic export and re-export for China have been increased.

Table 9: Hong Kong's Imports from China

Year	Total imports from China <u>US\$m</u>	Re-exports to other countries <u>US\$m</u>
1989	25,215	20,517
1990	29,466	30,822
1991	36,574	40,473
1992	43,852	51,770

Source : (i) "Annual Review of Hong Kong External Trade", Hong Kong Government Census & Statistics Department, various issues.
(ii) "Almanac of China's Foreign Relations and Trade", various issues.

Remarks: The higher re-exports values than the total imports values were due to the packaging or other added value processes conducted in Hong Kong as well as the mark-up before re-export to other countries.

Table 10: Hong Kong's Exports to China

Year	Total exports US\$m	Domestic exports US\$m	Re-exports US\$m
1989	18,816	5,548	13,268
1990	20,305	6,086	14,219
1991	26,631	6,975	19,656
1992	35,136	7,943	27,193
1993	43,324	8,124	35,200

Source : (i) "Hong Kong Monthly Digest Statistics", Hong Kong Government Census & Statistics Department, various issues.
(ii) "Almanac of China's Foreign Relations and Trade", various issues.

Table 11 shows China's exports and its share of the total world's export trade. China's export trade has become more important in the world's market in recent years. Table 12 shows the percentage of China's re-exports to other countries via Hong Kong as part of China's total exports. The percentage has increased from 45.9% in 1989 to 66.1% in 1993. Hong Kong is a very important entrepot for China and its importance has becoming more and more critical to China's world's trade.(HKTDC, 1991)

Table 11 China's Export Share and Ranking in World Total Exports, 1989-1993

Year	World exports (US\$ m)	China exports (US\$ m)	China's share in world exports (%)	Ranking
1989	3,036,065	52,538	1.7	14
1990	3,470,000	62,093	1.8	15
1991	3,530,000	71,842	2.0	13
1992	3,700,000	84,940	2.3	11
1993	3,687,000	91,763	2.5	11

Source : "Almanac of China's Foreign Relations and Trade", various issues.

Table 12 Re-export from China to Other Countries through Hong Kong

Year	Re-exports from China to other countries through Hong Kong (US\$m)	China's Total Export (US\$m)	Per cent of China's re-exports via Hong Kong's to China's Total Exports
1989	20,517	52,538	39.0
1990	30,822	62,093	50.0
1991	40,473	71,842	56.3
1992	51,767	84,940	61.0
1993	60,770	91,763	66.2

Sources : "Annual Review of Hong Kong External Trade", Hong Kong Government, various issues.

Outward processing

The above observations have shown that the China related re-export of Hong Kong, i.e. the China re-export via Hong Kong to other countries, has become the most significant component in Hong Kong's export trade. This rapid growth in re-export trade between HK/China is due to the rapid increase in outward processing between the two places. Through outward processing, raw materials, components and work-in-progress are being sent to China for further processing and assembly before the finished products are re-exported to other countries via HK. Table 13 shows the estimated values and proportions of outward processing trade for imports from and exports to China between 1989 to 1993.

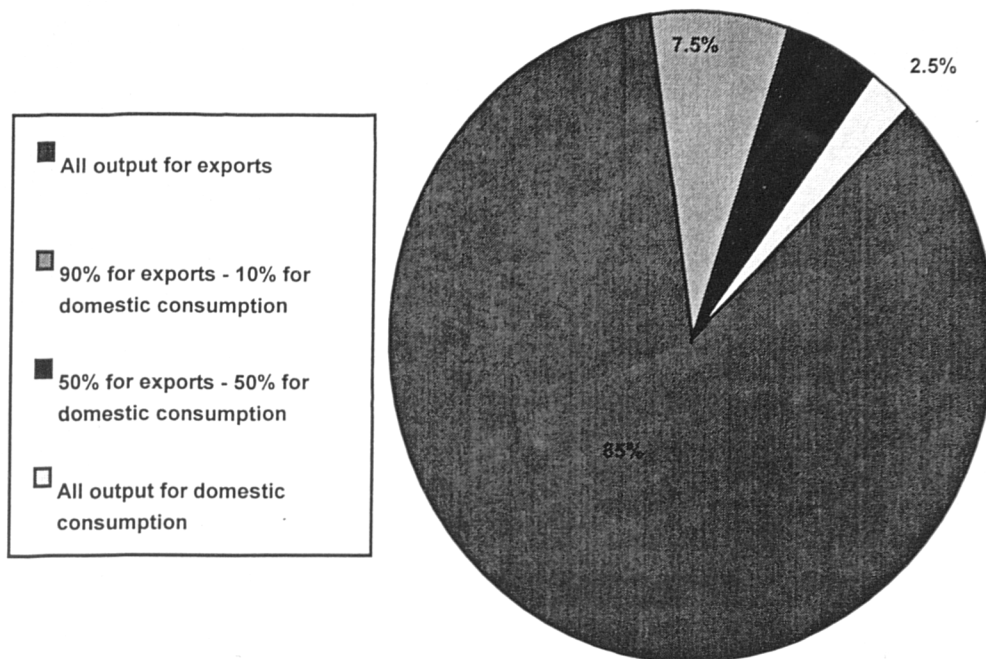
Table 13: Estimated Proportions of Outward Processing Trade Between HK/China

Trade Type	Estimated % of Outward Processing Trade (%)				
	1989	1990	1991	1992	1993
Imports from China	58.1	61.8	67.6	72.1	73.8
Total exports to China	58.4	60.4	64.6	68.7	71.8

Source : "Hong Kong Manufacturing Industries 1994", Hong Kong Government Industry Department.

The surveys of this project conducted in 1995 also confirmed that the majority of Hong Kong manufacturers in China are manufacturing for export. Fig. 15 shows the summary of the survey finding in terms of production output for export:

Fig 15: Production Output of HK manufacturers in China for Exports(% of response)



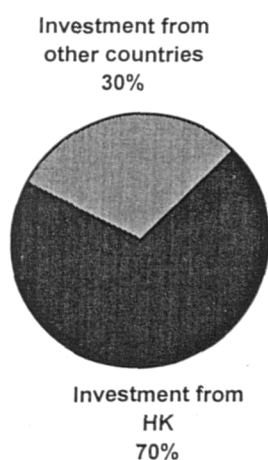
IV.2 Hong Kong Investment in China

Another important measure of the Hong Kong/China economic tie is the amount of Hong Kong investment in China and vice versa. In 1992, over 70% of China's direct foreign investment came from Hong Kong. In return, China is the largest overseas investor in HK. China invests actively and heavily in various business sectors in Hong Kong. It is estimated that China had over HK\$12 billion investment in Hong Kong in 1992, including manufacturing, real estate, telecommunication and banking etc. In manufacturing, China is the third highest foreign investor after Japan and USA in HK.(Industry Department, 1993)

IV.2.1 Share of Hong Kong Investment in China

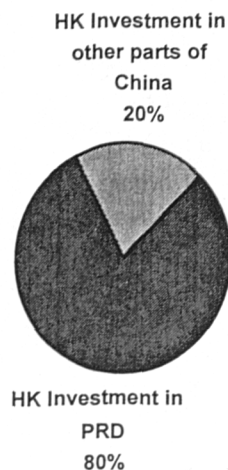
Referring to Table 6 & 7 on p. 42, Hong Kong contributed to a very high percentage, i.e. 70%, of the FDI in China in 1992.(Fig. 16) As mentioned previously, this high value of FDI from Hong Kong might be exaggerated by the investment of other countries to China via the Hong Kong banking system. The FHKI's survey in 1993 showed that over 80% of the HK respondents in the survey invested in the PRD region.(Fig. 17) All these had shown the importance of Hong Kong investment in PRD to the China's economic reformation. (FHKI, 1993)

Fig. 16: Proportion of Hong Kong Investment in China in 1992



Source: China Statistical Yearbook

Fig.17: Proportion of Hong Kong investment in PRD
(% Respondents in FHKI's Survey in 1993)



Source: FHKI, 1993 Survey

IV.2.2 Types of Industries Relocated to China

The Federation of Hong Kong Industries conducted a survey among all its members regarding the Hong Kong Investment in China in 1993(FHKI, 1993). Table 13a shows the % of respondents that had investment in China by industries. Only the industries among the highest and the lowest rates of investment in China are shown in the table:

Highest Investment Rates Industries	<u>% Respondents</u>
Leather and Rubber	82.4%
Electronics	77.8%
Electrical and Optical Products	72.7%
Watch and Clock	71.4%
.	.
.	.
.	.
Lowest Investment Rates Industries	
Food and Beverage	43.3%
Textiles	30.3%
Chemical & Pharmaceutical	29.0%

Table 13a: Rates of Investment by Industry in China(Source: FHKI, 1993 Survey)

The findings of the survey have shown that the most active industries invested in China were the labour-intensive industries such as leather and rubber, electronics, watch and clock, electrical and optical products and toys. This reconfirms the fact that the huge supply of cheap labour has been the key attraction for the Hong Kong Manufacturers. Hong Kong manufacturers could be very selective in recruiting the young and hard working workers and paying less than one-fifth of the Hong Kong wage rate. Because of the very disciplined workers, labour skills could be acquired through training, mostly on the job training. Some other labour intensive industries like apparel and textiles were much less active because of the rule of 'origin' and the import quota system imposed by other countries. The extent of investment for industries with sophisticated manufacturing technology and high quality labour, like chemicals and pharmaceuticals etc., was also low. Even for food & beverage industries the investment level was low, but the percentage of manufacturers planning to invest was very high due to the opening of the Chinese domestic market. With the extensive shift of HK manufacturing plants to China, many supporting/linkage industries have also been relocated.

IV.2.3 Timing of the Relocation

In the FHKI 1993 survey, 72.3% of the respondents started their investment after 1985. It was because of the improvement in investment environment after the learning period at the initial stage of China's reform. China has become more experienced in dealing with foreign investment with more mature laws and regulations, better developed infrastructure such as utilities, road and port facilities etc. The firm commitment to open-door policy from Chinese officials has also boosted the confidence of the Hong Kong manufacturers. To couple with the spiral of labour shortage, ever increasing land and labour costs in the late

1980's in Hong Kong, Hong Kong manufacturers started to extensively shift their plants to China. At present, most manufacturers have even more investment in China than in HK with some of them having insignificant levels of investment in other countries.

IV.2.4 Location of Hong Kong Investment in China

Guangdong has been the most popular province for foreign investment with the longest history of opening to the outside world. It was selected by the Chinese authorities as the province for locating the first three of the four Special Economic Zones(SEZs) in 1979. Many Hong Kong manufacturers have invested heavily in the Guangdong province. The Pearl River Delta(PRD) of Guangdong has emerged as the most favoured investment destination due to its geographical proximity, availability of low-cost labour/land and the preferential treatments offered by the Chinese government. PRD is adjacent to Hong Kong and over 80-90% of the people over there speak Cantonese, i.e. the dialect in Guangdong and Hong Kong. It is estimated that at present Hong Kong manufacturers operate 25,000 factories and employ as many as four million workers in Guangdong and most of them are working in the PRD region(Far East Economic Review, 1994). The proximity of PRD facilities management controls, technical support and other backup services from Hong Kong with minimum transportation time. The easy access to the port facilities in Hong Kong is also another important attractive factor. Table 13b summarizes the location of factories in China of the respondents.

	<u>% Respondents</u>
Factories Located in Guangdong Province	89.5%
Factories Located in Major Cities of PRD	
Shenzhen	40.2%
Dongguan	16.7%
Guangzhou	9.6%

Table 13b Locations of Factories in China
Source: FHKI, 1993 Survey

Shenzhen adjacent to Hong Kong, is the most popular place with the largest number of Hong Kong's plants. Dongguan(a bit further away from Hong Kong) and Guangzhou(the capital of Guangdong province) are the second and third most popular places for Hong Kong manufacturers respectively. These three major cities in PRD covered about 80% of all respondents' investment in China in 1991 survey(FHKI, 1991) and this figure had dropped to less than 70% in 1993 survey. This has shown a tendency of building or relocating factories outside the three major cities in PRD to save costs. The geographical distribution of Hong Kong plants in China depends significantly on the distance from Hong Kong, i.e. the number of plants decreases with the distance from Hong Kong. The Cantonese dialect, the close social cultures and practices in PRD also contribute to the rapid development of the HK/PRD industrial integration. In recent years, the land and labour costs in PRD have become more expensive than other inland provinces. However, with the long term business relationship established in the last 15 years and the high potential to explore China's domestic markets as well as the inadequacies of infrastructure development in other provinces, Hong Kong manufacturers still find PRD a very attractive place to invest. The rapid increase in labour wages in PRD has been released by the huge flow of cheap labour from other inland provinces.

IV.2.5 Scale of Hong Kong Investment in PRD

Table 13c shows the investment size of respondents in China.

Investment Size	<u>% Respondents</u>
< 10 Millions	41%
>10 Millions < 20 Millions	37.5%
> 20 Millions	22.5%

Table 13c: The Investment Size in China
Source: FHKI, 1993 Survey

The FHKI 1993 survey has shown that the majority(41%) of Hong Kong investments fall in the small to medium size category with investments of less than HK\$10 million. The large scale investment, i.e. investments exceeding HK\$ 20 millions, constituted only 22.5% of the respondents. The average employment size was 786 persons in China which is much bigger than the average employment size of thirteen in Hong Kong in 1993. Most Hong Kong plants in China recruited local Chinese operators and workers with a very small percentage (less than 1%) of senior managerial or supporting staff from Hong Kong. Table 13d shows the performance statistics of China Operations indicated by the respondents.

Performance	<u>% Respondents</u>
very profitable or profitable	63%
Potentially profitable	27%
Not profitable	2.64%
No comment	7.36%

Table 13d: Performance of China Operations
Source: FHKI, 1993 Survey

Most of the respondents considered that their operations in China were profitable. The majority of the respondents had plans to expand their manufacturing operations in China.

IV.3 Role of Hong Kong in the Strategic Development of HK/China Manufacturing Industries

IV.3.1 Financial and other Services Support Centre

Hong Kong is a major financial Centre in the region. In terms of the number of banks, Hong Kong is the third in the world. It managed US\$114 billion funds in 1989.(Overholt W.H., 1993) Tokyo is a competitor for Hong Kong but it is too expensive a place with language and culture difficult to be understood by foreigners. Singapore's market

operations are over regulated, particularly the press. Many of the popular financial news, journals and magazines are banned in Singapore. This is a serious interruption to the information-intensive based financial industries. The openness of Hong Kong, in terms of international flows of funds and information, allow Hong Kong to utilize funds more effectively in the liberalized financial market.(Nonthapunthawat N.,1992) With over two billion population in Asia, substantial finances are required to keep the region's economic growth. The costs and success of fund raising depend very much on the availability of financial techniques, bankers, accountants, lawyers, information and telecommunication support etc. The more complicated the financing jobs the more important will be the skills, the infrastructure and the experience. With the rapid expansion of trades, investments and other international business in HK/PRD, the demand for high-level professional accounting, legal, information, and management consultancy services specific to the region are required. These are all available in Hong Kong with good specialized skills and experience. Hong Kong also contributed significantly to the liberalization of the exchange rate of Yuan to US\$ according to market forces. In the 1980s and early 1990s Hong Kong manufacturers acquired US\$ by exporting their products manufactured in China. Most Hong Kong manufacturers did not remit the US\$ earned from exports back to China to cover their operating expenses in Yuan through the official channel at official exchange rate. Instead, they paid the US\$ to those firms(who have unconvertible Yuan in China)in Hong Kong who needed to convert Yuan to US\$ at the black market rate. These firms in turn would pay Yuan to the Hong Kong manufacturers in China directly. The Hong Kong firms investing in China's domestic market generated a lot of unconvertible Yuan in China which they could change to US\$ by this means at the black market rate in Hong Kong.

Similarly, Hong Kong residents remitting money back to Chinese relatives could sell Hong Kong dollars to Hong Kong enterprises that had unconvertible Yuan in China at the black market rate. These Hong Kong enterprises could pay Yuan to their relatives in China directly. Because of the existence of this black exchange market in Hong Kong, remittances through official channels had almost disappeared in the early 1990s. The Chinese government had eventually devalued the official rate of Yuan close to the black market rate, and Yuan has become free to exchange in Hong Kong since 1994. The liberalization of Yuan was due to many other reasons beyond the scope of this project, nevertheless, the contribution from Hong Kong in this respect should not be overlooked.

IV.3.2 Hong Kong: Facilitating China's Non-State Enterprise Liberalization Process

Many Chinese provincial authorities have established joint ventures(JVs) with HK companies in HK. Since the JVs are HK based companies and located in HK, approval for establishing these JVs from the central authorities are usually not required. This extensively activates China's enterprise liberalization process. Many Chinese local authorities, in particular those in the Guangdong province, encourage people who have relatives in HK to emigrate to HK and establish corporation in HK to promote trade and investment for the local authorities. This provides a lot of flexibility for the local authorities to decentralize and liberalize their trade operations to the market system without central government intervention. Since these Chinese local government representatives already have HK citizenship, they are free to operate in HK. Many provincial authorities even officiate these co-operations in HK as the province's overseas enterprises.

IV.3.3 Hong Kong: Bridging China with the Rest of the world

Hong Kong has been the contact point for China with the rest of the world for decades and this intermediate role has been further enhanced in recent years. Hong Kong facilitates China's trade by acting as catalyst to lower the transaction costs of the trade. Hong Kong is the major technology and management know how transfer centre for China. Because of its superior position, Hong Kong is most suitable for large multinational companies intending to explore South East Asian or China markets to set up their regional headquarters. Many multinational firms set up their offices in Hong Kong first. If their initial investments are profitable they will enlarge their operations in China or South East Asia via Hong Kong. A recent survey showed that Hong Kong held 51% of Pacific Asia's regional headquarters, Singapore 29%, and Tokyo 20%. (Wilson J.C., 1992) Due to the restriction of direct trade with China in Taiwan, Taiwanese also need to trade indirectly with China via Hong Kong. The success of Shenzhen, which is adjacent to HK, also demonstrates the importance of HK to China's economic reformation and the close link between HK and China.

IV.3.4 Entrepot trade

Hong Kong is a focal point for technology, capital, management skills and ideas to bridge China and the capitalist world. In theory, with the opening of China, the SEZs could compete with Hong Kong and the role of Hong Kong as middle man may be decreased. However, with the domination of Hong Kong investment, the SEZs in PRD are complementary rather than competing with Hong Kong. Hong Kong provides excellent trading services, i.e. finance and insurance support, good transportation facilities etc. The entrepot trades between Hong Kong and China are continuously to expand. The role of Hong Kong to mediate between China and the outside world has even been enhanced. In

the 1980s, despite the advanced development in telecommunication systems and the liberalization of trades in many countries, the entrepot role of Hong Kong and Singapore in world trade increased dramatically. This was due to the special skills required to bring the ever increasing number of sellers, buyers and the range of complex products together . In today's global markets, almost all countries could be sellers or buyers of large varieties of products ranging from raw materials to sophisticated technology etc. to each other. There are infinite permutations of seller, product, buyer, mode of transport, insurance coverage and financial terms. Very highly specialized skills and systems are required for effective trading. The role of Hong Kong as centre of entrepot trade for China has become more important than ever.(Soesastro H., 1992.)

IV.3.5 Manufacturing and R&D Support Centre

With the manufacturing back up from China, Hong Kong has evolved from manufacturing to management, design, research and development. Hong Kong has recruited nearly 4 million industrial workers in PRD region(Far East Economic Review, 1994). Hong Kong has become the manager of manufacturing in HK/PRD region. With the success of China's fastest expansion export-oriented manufacturing, Hong Kong/PRD has become the major manufacturing region in the global market. China is the manufacturing base and market for Hong Kong, Hong Kong is the bridge for international business for China.

In the past, China had put considerable efforts into Science and Technology, and in some areas like the achievement in the space industry is at the world level(Overholt W.H., 1993 and UNIDO, 1992). China has cultivated a team of science researchers and experts with a huge reservoir of scientific skills and findings. However, China is lacking the

entrepreneurship to transform the scientific findings into a productive force and marketable commodities. Most of these findings and skills have never been tapped for commercialization. The synergy of China's scientific strengths with the Hong Kong's strong entrepreneurship would stimulate and facilitate the development of high value-added manufacturing in Hong Kong/PRD. There is a good chance that Hong Kong would gradually emerge as the support centre for commercialization of China's scientific research. Initially, such HK/China scientific efforts will concentrate on highly specialized areas such as the invention of Chinese-language computer software, but wide-ranging production is likely in the near future. Using HK as a base for design, development and marketing, and China as a base for basic scientific research and manufacturing, HK/PRD would have high opportunity to be developed as a high technology, product innovation and process automation centre in the world market. Compensating the superiority and inferiority of China and HK would generate a giant force in this respect.

V. Hong Kong-China Linkage

China is now Hong Kong's largest trading partner : the top supplier of imports, the largest re-export market, and the second largest domestic export market after the United States. The flow of investments between China and Hong Kong has been increasing. Almost every province, region and municipality in China now has resident representative offices in Hong Kong. Hong Kong has extensive communications links with China. Hong Kong's bond and capital markets are being increasingly utilized by Chinese financial institutions. A vast amount of information on China's economy, investment and trade events are available in Hong Kong. Hong Kong is playing the role as market for China's exports,

source of supply of commodities for China, middleman handling entrepot trade, trade facilitator offering different trade services and advice, promoter of Hong Kong / China trade, and technology and management know how transfer centre for China. Hong Kong has really facilitated China's industrialization process.(The Hong Kong and Shanghai Banking Corporation Ltd., 1990 & The Federation of Hong Kong Industries, 1991)

The Hong Kong-China co-operation is a key factor to continue the existing prosperity of both places. In addition to low cost manufacturing, Hong Kong manufacturers should review their development strategies by exploring more on research and development, product innovation, process automation and marketing information services.

Hong Kong has much easier access to the latest technology from overseas sources, which China lacks. Many successful examples have shown that Hong Kong manufacturers can bring their technologies into China and turn out highly competitive products. Hong Kong manufacturers can also help to commercialise the Chinese technological research results or make use of China's research and development to develop high technology manufacturing in HK and PRD.

In approaching the year 1997, with the sovereignty of Hong Kong returning to China in the forthcoming political merging, the economic linkage between China and Hong Kong will become more extensive. The emerging of the South China Economic Zone with the cheap land and labour advantages of PRD, coupling with the management and capital strengths of HK will develop the HK/PRD region to become a world class manufacturing zone to rival with Korea in size(Hong Kong Economic Survey Ltd., 1989). The development of Hong Kong manufacturing industries in the last decade has concentrated to its linkage with

the industrial development in China, and vice versa. Each side has benefited greatly by fostering their mutual strengths. This interdependence between Hong Kong and China is likely to continue into the next century and beyond with a much bigger scope and on a much larger scale.

CHAPTER 4: QUALITY MANAGEMENT PRACTICES IN HK/CHINA MANUFACTURING INDUSTRIES

I. Importance of Quality Management in HK/China Manufacturing Industries

Transferring low cost activities to China does not mean that Hong Kong manufacturers can escape from the customer focused quality requirements. The global markets have become extremely competitive not only for high-end goods but also for low-value products. The transfer needs to be a total transfer of technical, financial and management know how and particularly the quality management expertise to China. For a successful transformation, HK manufacturers must make quality products better, faster and cheaper than those of their competitors. Adoption of effective quality management strategies will be one of the most crucial factors for success in Hong Kong/China manufacturing industries.

The world market has become highly competitive. Everybody, everywhere is in pursuit of higher quality. The impact of quality is so enormous that it can directly be beneficial to a company's competitiveness, both locally and globally. There is no exception for Hong Kong/China manufacturing industries. In 1987, a set of international standards for quality system, ISO9000 series, was officially established by the International Organisation for Standardisation(ISO).

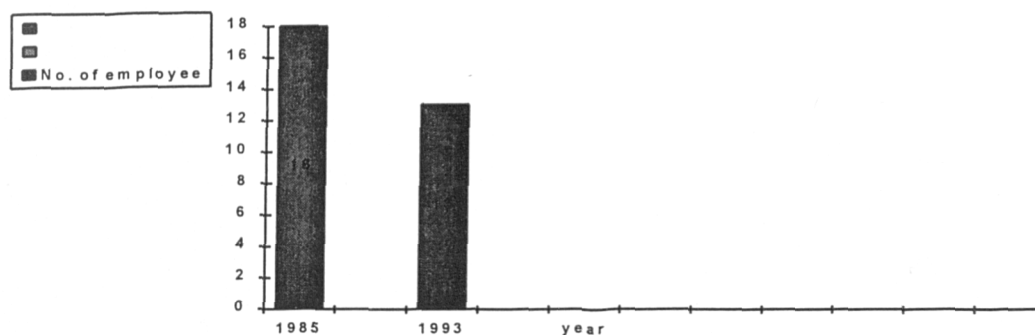
II. Quality Management Practices in HK Manufacturing Industries in 1990:

II.1 Importance of Small and Medium Sized Enterprises(SMEs)

Hong Kong manufacturing industries mainly consist of small and medium-sized enterprises(SMEs). Recently, owing to the increasing automation and the shift of labour-intensive and low-end production to China, the average size of industrial establishments has dropped from 18 persons in 1985 to 13 persons in 1992. Of the 41,937

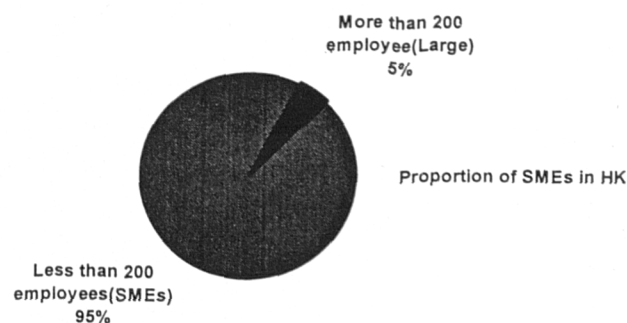
industrial establishments in 1992, 39,882 (95.1%) of the establishments employed fewer than 200 persons (Industry Department, 1993). Although making up the vast majority of HK's manufacturing establishments, those employing fewer than 200 persons only employed 286,540 persons in total (50.2% of total manufacturing employment) in 1992. SMEs are classified as manufacturing firms employing 200 or less employees and all firms with more than 200 employees are classified as large companies. Fig. 18 & 18a summarize the situation:

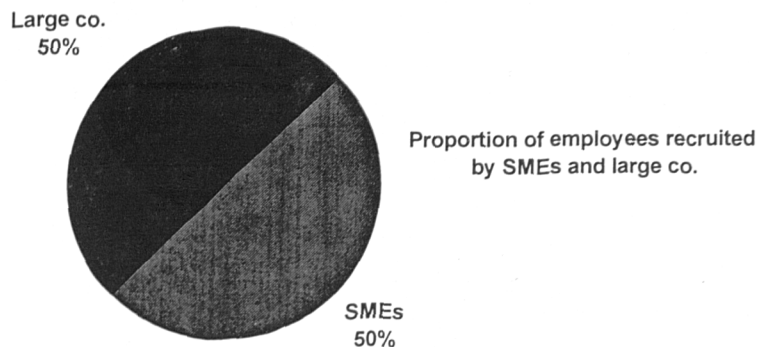
Fig.18: Average company size in Hong Kong



Source: Industry Department, 1993

Fig. 18a: Importance of Small and Medium Sized Enterprises(SMEs) in HK





In Hong Kong, the SMEs support all facets of local manufacturing. Many SMEs operations are closely linked with the large and multi-national manufacturers through an efficient network of subcontracted processing arrangements. It provides Hong Kong manufacturing with a flexibility that can respond swiftly to changes in external demands. Small companies are often not technologically progressive. They may not have the expertise, the contacts or the personnel needed to keep up with new developments. Nevertheless, competition is omnipresent and everyone is working close to his neighbours in a unified market so no one can afford to fall behind.

The impact of the quality movement in Hong Kong covers the SME's and the large enterprises. However, the common belief is that the SMEs lack the resources and capability to cope with the change. Empirical research was conducted in 1990 to investigate the practices of quality management in HK manufacturing industries with special reference to the SMEs(Yam C.M. et. al., 1993a). This section reports the status of Total Quality Management(TQM) awareness and practices in HK manufacturing firms in 1990 and the opportunity of and strategies for the firms to achieve TQM in HK.

II.2 Quality Attributes

The important features of good QM practices are a company's organisational structure, definition of authority and responsibility, availability of updated quality manuals, approved policy and clear quality objectives. The ISO9000 standards stipulate these as mandatory items for compliance and certification purposes. A properly written and updated quality manual specifying the company quality policy with respect to its mission together with core quality operatives are the basis of good manufacturing practice.

Quality Attributes	<u>% of Respondents</u>
Established Quality Department	49%
Quality objectives set with product features	67%
Job responsibility not defined nor documented	75%
Quality Objectives set by middle/low management levels	75%

Table 14: Quality Attributes, 1990 Survey

Table 14 shows that only 49% of the respondents had quality departments and in most cases quality objectives were set with respect to product features only. Moreover, in 75% of the firms, job responsibilities were neither defined nor documented. These findings showed that most HK manufacturers lack top management's commitment and support towards TQM. Quality objectives were often set at middle/lower management levels with no integration of quality at the top through corporate quality policies and manuals.

II.3 Quality Attitude Towards TQM

	<u>% of Respondents</u>
Aware of TQM	42%
Not implementing TQM in the near future	36%
Quality Practices not implemented	33%
Acquisition of TQM through cultural approach	17%

Table 14a: Quality Attitude towards TQM, 1990 Survey

Table 14a shows that only 42% respondents were aware of TQM. Vast majority of the respondents took up to three years to get acquainted with the philosophy of TQM, and obtained sufficient knowledge of the related tools to support continuous quality improvement. 36% of the respondents did not have plan to implement TQM in the near future. One in three of the respondents had not implemented any quality practice at all. The reasons for not adopting TQM included: TQM was complex and meant for large corporations only; a large amount of resources would be needed to sustain the momentum of change and development. In SMEs delivery and cost were still perceived as the main criteria for profit maximization. On the other hand, 17% of the respondents preferred to acquire TQM through a cultural approach with focus on people. Employees' training, development and motivation etc. could affect the success of TQM to a great extent. It was revealed by several respondents through interviews that for small manufacturing firms, staff often did not have sufficient prerequisites to begin learning TQM or quality technology. But they recognised that TQM did not mean just a quality control department.

II.4 Quality Practices in Functional Areas

The following functional areas were investigated: design, product development, engineering, purchasing, suppliers evaluation, incoming quality and process control and maintenance. Table 14b summarizes the survey findings:

Quality Practices in Functional Areas	<u>% Respondents</u>
Formal design reviews for new product development	79%
Documented the design changes	30%
Documented changes of all kinds	24%
Formal written brief for new products prepared by marketing	48%
Documented quality plan to finalize purchase contracts	18%
Use of breakdown maintenance	60%
Use of statistical process control(SPC)	53%

Table 14b: Quality Practices in Functional Areas, 1990 Survey.

79% respondents reported that they had formal design reviews for new product development. Firms in the electronics and plastics/toys sectors had significantly larger proportions of formal design reviews. Only 30% of the firms had documented the design changes. 24% had documented changes of all kinds. An important quality related issue is the linkage between marketing and design. Only 48% indicated that their marketing department prepared formal written briefs for new products. With such a loose link between marketing and design, manufacturers could hardly ensure that quality be built in at the early stage. Neither existing nor perceived customer needs would be identified clearly without such joint efforts of various functions. The survey also showed that the main function of purchasing in most firms was the procurement of parts and assemblies for manufacturing. Although supplier quality reviews were cited as important elements, only 18% of the companies had documented quality plans to finalize purchase contracts. Such a low percentage could be attributed again to the sole focus on price and delivery. Towards supplier qualification, the majority still relied on classical sampling or full inspection on incoming products. Very few respondents performed the assessment with regard to QM systems and established standards like ISO9000. 60% of the respondents conducted breakdown maintenance on an 'as needed' basis. Only one in two of the respondents applied Statistical Process Control (SPC).

II.5 Utilization of External Quality Assurance Services

	<u>% Respondents</u>
External Services used: HKPC	25%
FHKI	13%
University/Polytechnic	17%

Table 14c: Utilization of External Quality Assurance Services, 1990 Survey

Testing, standards and calibration were the three most commonly used quality services provided by the Industry Department of Hong Kong Government. The training and consultancy services provided by Hong Kong Productivity Council (HKPC) were also very popular where one in four of the respondents used or consulted with their Training Division. On a relative basis, utilization of services provided by the Federation of Hong Kong Industries (FHKI) and tertiary institutions appeared to be significantly lower with the exception of extension courses and seminars conducted by the tertiary institutions. Although the number of seminars, conferences and extension courses on the new areas, particularly ISO9000, had increased, most of the respondents still felt that many of these meetings or courses were below expectations in terms of ease of comprehension, demonstration of applicability and availability. The overall external services were inadequate in terms of availability and utilization of services.

II.6 Comparing SMEs With Large Companies

A significantly higher percentage of large companies had documented quality manuals, established policies and defined responsibilities. However, in some areas such as use of scheduled maintenance and quality services, the difference was less obvious. Both groups were equally aware of the multitude and range of training available and both utilized extension courses and seminars extensively. Large firms tended to prefer more training in cost of quality measurement and design quality, while SME's also ranked cost of quality first followed by SPC. The proportion of large companies who indicated that they had not implemented total quality was somewhat less than the SME's but the difference was insignificant.

II.7 Overall Situations in 1990

The survey revealed a poor level of awareness in quality management with few companies having actually implemented TQM in 1990. The inability to develop a disciplined and structured approach towards documentation of operations and changes, minimal efforts placed on prevention, misconception, ignorance of cost of poor quality, ineffective use of SPC, disregard for internal and external training were the major barriers to attaining good quality and reliability in Hong Kong. Although large firms usually had better-documented quality manuals, difficulty in documentation, defining responsibilities and preventive maintenance were the common diseases in all firms.

The survey results also indicated that most manufacturers in the territory were very much lagging behind world class in quality management. Many of them needed to focus on quality with customer satisfaction as their primary goal. They needed to achieve quality through a continuous process in the long run. To continue the emphasis on export-orientation, HK manufacturers should play a more significant role in the quality campaign. TQM can be disseminated much easier in SMEs due to fewer employees and levels of management. Top management commitment and willingness to implement TQM are the foundation to attain TQM. The ISO9000 quality system is only a platform to TQM. The practice of TQM must be brought to a strategic sense. SMEs could acquire the essential quality knowledge through training. A careful selection of the type of training would be very useful. Merely imitating the large companies' styles would only lead to failure and disappointment. Rather, SMEs in HK should make full use of their flexibility and ability to change in incorporating quality management as part of the firm's culture.

III. Quality Movement in HK/CHINA Manufacturing Industries During 1990-94

III.1 The Impact of ISO9000 Certification

III.1.1 Needs for ISO9000

ISO9000 is a set of international standards for both quality management and quality assurance. ISO9000 applies to all types of organizations across the world, large and small, manufacturing and services. It is a standard "language" for documenting quality practices, a system to track and manage quality assurance activities throughout the organization, and also a third-party auditing model to assess, certify and maintain certification for organizations(BSI, 1987 & Rothery B., 1991). ISO9000 has provisions for documentation of specifications for suppliers, design control, process control techniques, calibration of equipment, and packaging and shipping, etc. The ISO9000 is used by all industries and its principles are applicable no matter if the company size is 20 or 20,000. The ISO9000 standards have now been adopted widely in many countries(Industry Department, 1994) as their own national standards for quality system. It is anticipated that greater numbers of companies within these countries will be seeking and obtaining certification and starting to request their suppliers to be audited and certified against the requirements of ISO9000. Since 1987, the ISO9000 series have been used extensively in many countries for setting up quality assurance management systems. Experiences have demonstrated that the direct benefits of ISO9000 are considerable, such as, breakdown of internal barriers, tangible goal to all employees, assured quality level, reduced inspection costs and better use of scarce resources, etc.(Pyle, 1995)

III.1.2 ISO9000 in Hong Kong

The Hong Kong government has so far adopted the non-intervening policy for the Hong Kong manufacturing industries. Nevertheless, recognizing the importance of quality to the future of the Hong Kong manufacturing industries, the Hong Kong government has launched the ISO9000 certification scheme in Hong Kong since 1989 under the administration of the Hong Kong Quality Assurance Agency (HKQAA). HKQAA is a government subsidized body which is governed by the Hong Kong Quality Assurance Council with members from the government, industry and academics. The main focus of HKQAA is to assess and certify companies to ISO9000. The British Standards Institute (BSI) was engaged as consultants to get the certification programme started. There have been a large number of ISO9000 certificates awarded by the HKQAA (HKQAA, 1995) and more others are in different stages of the application process. Achieving ISO9000 registration has some implications on whether manufacturers can continue to export their products in the competitive world. In particular, companies in Hong Kong and PRD regions which are mostly export-oriented, without ISO9000 certification, they may well find the lucrative international markets more difficult to penetrate. This would be especially true for very competitive and high-value added products such as electronic parts, automotive and related components. However, low cost products will also have no exception.(Chin K.S. et. al., 1995b)

III.1.3 Surveys on ISO9000 movement in HK/China Manufacturing Industries

Two empirical researches have been carried out in 1992 and 1994 respectively to investigate the impact of the ISO9000 movement in HK/China manufacturing industries

through questionnaire survey and structured interviews. The survey findings in 1994 are compared with those in 1990 and 1992 in order to find out the changes of quality management practices in the past 4 years. Following are the major findings:

III.1.3.1. Impact of ISO9000

Table 15 compares the survey findings in 1990 and 1994. From 1990 to 94, the awareness and adoption of ISO9000 increased dramatically from 13% and 16% respectively for SMEs and large companies to 74%. It is revealed that the concept of quality management has well been accepted by the Hong Kong manufacturing industries, including the SMEs. As most of the Hong Kong Manufacturers have perceived that the European Union and many other overseas companies may require their suppliers to comply with the ISO9000 quality standards, they have to strive to implement the ISO9000. There is a growing need for the SMEs to obtain the ISO9000 certification since their certified local clients also look for ISO9000 certified suppliers.

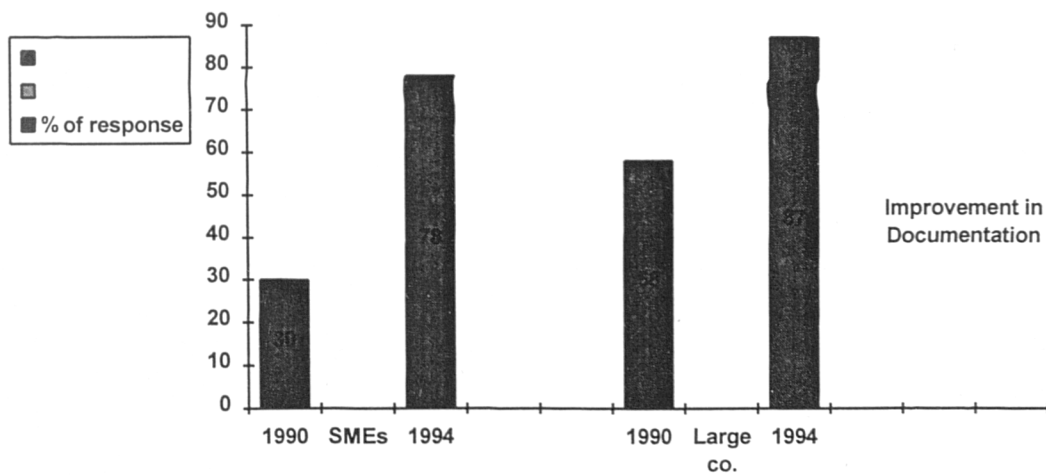
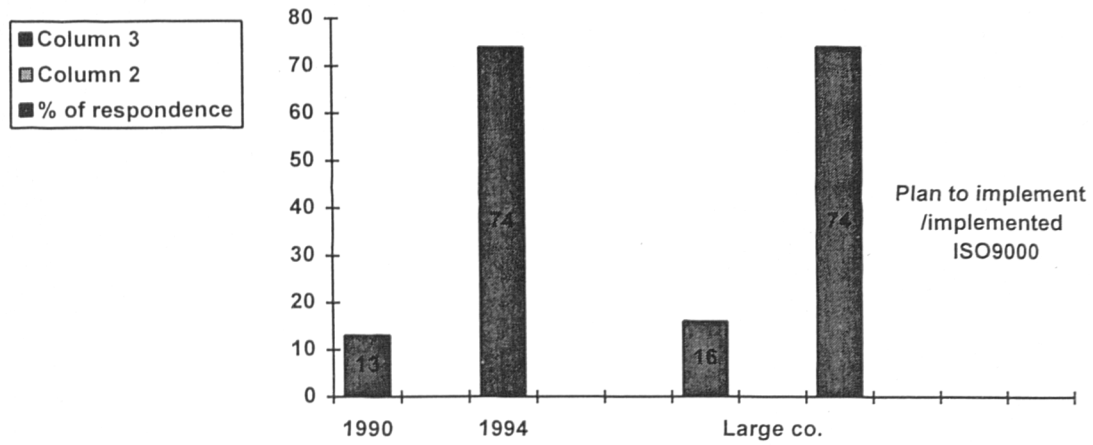
Table 15: Comparison of Quality Management Survey Findings in 1990 and 1994

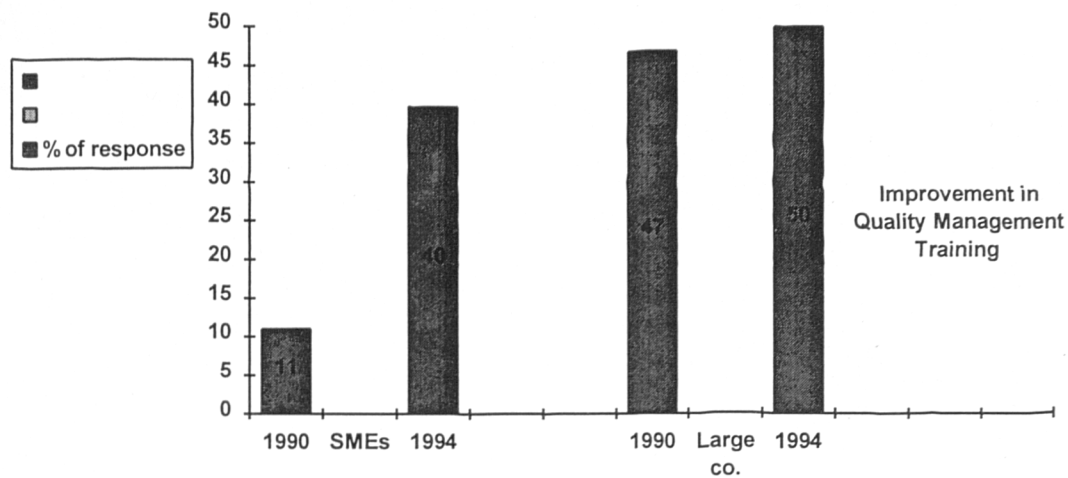
Quality Attributes	% of Respondents			
	SMEs		Large Co.	
	1990	1994	1990	1994
- Plan to implement/implemented ISO9000	13	74	16	74
- Have written quality policy/manual	40	47*	64	73*
- Document design information/changes	30	78	58	87
- Define job responsibility clearly	25	32*	41	65
- Focus on preventive quality control	0	25	4	32
- Focus on quality practice training	11	40	47	50*

* Z tests indicated no real difference between the percentages in 1990 & 1994.

For easy interpretation of table 15, the more significant quality improvement areas between 1990 and 1994 are highlighted in the following bar charts:

Fig. 19: Quality Movement in HK Manufacturing Industries (1990 to 1994)





A great advancement in adopting quality management systems was noted among all manufacturers including the SMEs. This was an indication of a significant change in top management attitude, commitment and support towards quality. The ISO9000 impact is generally regarded as the main driving force to such advancement.

III.1.3.2. Documentation

Proper quality documents specifying the company-wide quality system with respect to its policy together with core quality operatives is basic to any good manufacturing practice. The survey findings reveal that as compared with the large companies, SMEs had less documented quality policy manuals and defined job responsibilities. Improvement was, however, noted especially the 48% increase in documented design information/changes in SMEs. Companies in the electronics and plastics/toys sectors have significantly larger proportion employing formal design monitoring system.

III.1.3.3. Cultural Changes

Quality improvement always needs a cultural change where the focus should be on people. The right behaviour, attitude and values of employees towards quality is very important.

The training and motivation can affect the company's quality performance to a great extent. There were only 11% SMEs aware of such a need in 1990 but the figure increased to 40% in 1994. It reflects that more SMEs have accepted that sufficient staff training is one of the success factors to quality improvement. They have started to give employees the opportunity to develop and apply their skills to improve the quality of work and the workplace. Another fundamental shift in quality management philosophy was noted in past few years. In the 1990 study, neither the SMEs nor large companies were aware of the importance of preventive quality control. In 1994, although it was still not fully satisfactory, there were 25% and 32% of respondents from SMEs and large companies respectively focusing on the preventive mode of quality management. They have the slogan of "Doing the right things right the first time".

III.1.3.4 Problems in ISO9000 Implementation

Another recent research has also been conducted specifically to investigate the difficulties encountered in implementing ISO9000 in HK. Personal interviews were made to eight ISO9000 certified SMEs from the electronics and plastics, and toys sectors. The problems they encountered during their ISO9000 certification process as well as their implementation were examined. It was found that most of the problems were quite similar and in line with the findings of (Ebel K.E., 1991) and (Bemowski K., 1992). The major barriers for HK manufacturers to obtain the ISO9000 certification are listed in table 16:

Table 16: Major Barriers to ISO9000

<u>Areas</u>	<u>Major Barriers</u>
Management	<ul style="list-style-type: none"> - No concept and experience in establishing quality management system - No clear company organization and well-defined job responsibility - Difficulties in motivating staff participation
Quality System	<ul style="list-style-type: none"> - Set up quality system and <i>documentation from scratch as definite</i> quality policy/manual/procedure and records not available
Resources	<ul style="list-style-type: none"> - Lack of qualified and trained quality personnel - Lack of financial resource

Due to the perceived market requirements, most of the company's top management, usually the owners, were really committed to the ISO9000 implementation. However, because of the traditional 'narrow-scope' mind, most companies did not adopt the company-wide and systematic approach to handle quality issues at the beginning. More education and training in quality management system concepts and practices are essential to mentally change and prepare the senior management before implementing the ISO9000. Most of the middle managers and supervisors grew up from the shop floor level. In their past apprentice training, there was no quality system management component. They had a lot of "fear" when the company decided to start the ISO9000 programme and thus naturally had a strong resistance to change. Without the support of the middle management, the ISO9000 programme is hardly likely to be successful. Education and training are again important to alleviate the worries at the middle level. The major barrier in technical aspects was the lack of qualified and trained personnel to establish the system, to prepare the documents and to train other employees.

The advantages of SMEs to implement ISO9000 lie in its simple organizational structure with fewer layers and less employees. In SMEs, the top management, usually the owners,

can pass their quality messages more quickly, directly and clearly down to the employees and get quick responses. In most large corporations, due to the complex organizational structure, it always takes years to make the people at the bottom of the company commit themselves to the company quality goals. As people know each other in SMEs, it also takes less time to implement quality strategies and other quality improvement programmes because of less bureaucratic and departmental barriers.

III.1.3.5 External Supports

SMEs in Hong Kong generally do not have the capability and resources to keep up with the modern development in technology and quality management systems. External assistance is very useful in helping the certification and implementation of ISO9000. Hong Kong Productivity Council (HKPC), an government subsidized organization, assists the local companies, especially the SMEs, by providing technical support to ISO9000 related activities. In order to further help the SMEs, HKPC develops a sectorial syndicated consultancy approach for individual industry sectors on a sector-wide basis. For instance, jointly with the Hong Kong Watch Manufacturers Association (HKWMA), HKPC developed a quality manual and procedures manual in accordance with ISO9000 and based on information provided by HKWMA for the watch industry. The HKWMA members are then given guidance in applying the manuals as reference for developing ISO9000 systems and preparing documents in their own operations. The development cost is thus minimized as it can be shared by the companies in the industry. This approach reduces the resources required for SMEs to apply ISO9000 certification individually.

IV. CQI-The Beyond ISO9000 Quality Strategy for HK Manufacturing Industries

ISO9000 emphasizes mainly on assuring a company operating efficiently at its current status. As pointed out by Burr, the ISO9000 does not mention or make provision for continuous improvement (Burr,1990). ISO9000 does not address the quality performance of a product or service. Also, ISO9000 does not have a sufficient customer focus and supporting systems and processes needed for continuous improvement (Corrigan,1994). There is no requirement for a continuous improvement plan in ISO9001 while continuous improvement is one of the key criteria of the renowned Malcolm Baldrige National Quality Award (MBNQA) (Reimann & Hertz, 1993, Majerczyk & DeRosa, 1994). Having noted the importance of continuous quality improvement, a working group (the TC176 committee) of the International Organization for Standardization (ISO) has proposed to add a guideline on elements of continuous improvement in the ISO9004:1994 (Peach R.W., 1994 and Tsiakals J.J.,1994). ISO, however, has still no definite intention to broaden the quality assurance standard to include TQM in this revision (Tsiakals, 1994).

Every organisation must be aware that quality cannot be improved just by the imposition of rules and regulations. ISO9000 standards can, at most, be used as a good baseline for continuous quality improvement. Without total commitment in quality improvement, quality policy will merely be the first section of the quality manual and may not be properly implemented. On the basis of ISO9000 standards, a further commitment to CQI would become imperative for organizations to strive for survival and enhance their competitiveness. In recent years, the increasing concern towards enhancing product quality has become a prerequisite for establishing and sustaining competitive edge. Since HK

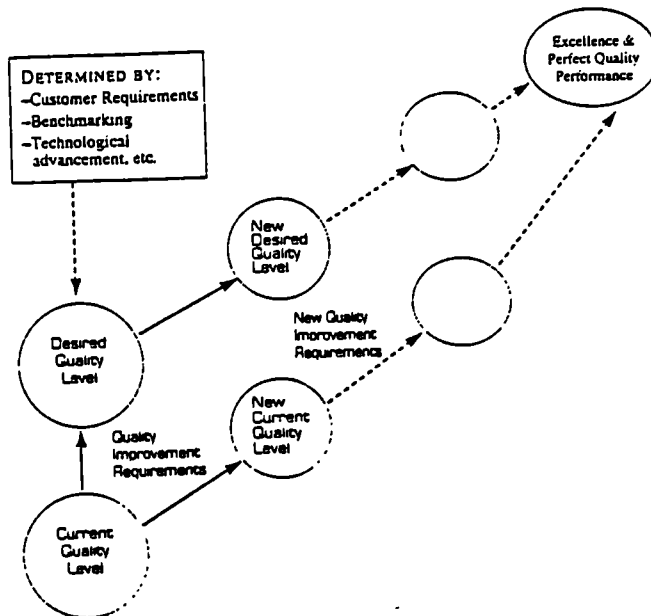
manufacturing industries rely heavily on export markets, HK manufacturers have to go through a substantial cultural change towards quality consciousness and assurance. This is attributable to the pressures from *internal improvement, marketing positioning, supplier control* and customer or regulatory requirements. Sound ISO9000 implementation can assure a company maintaining its current quality level. However, as the major customers continuously demand better quality products at competitive prices, continuous quality improvement(CQI) becomes the 'Beyond ISO9000' quality strategy for HK manufacturers. (Chin K.S., et. al. 1995a)

IV.1 THE ISO9000-CQI Integration

IV.1.1 Continuous Quality Improvement (CQI)

Deming and Juran (Deming W.E., 1986 & Juran J.M., 1989) both urged that the management must be responsible for implementing necessary actions in constantly improving quality in organizations. CQI is an effective means to help management to achieve this. CQI can be defined as a closed loop, company-wide programme that reviews and improves quality of the company's products and services continuously by gradual changes (Winchell W., 1991). It is a never-ending process and is an organization-wide amalgamation of various policies, concepts and procedures that have been designed to achieve "excellence". Figure 20 depicts the core concepts of the CQI process. Continuous improvement is forever, and each time when a process has been improved, a new state will be created to direct the company moving towards "excellence" and "perfect performance".

Figure 20: The CQI Process



Although applicable universally, CQI needs to be customised and tailored to meet individual requirements of different unique situations. Different business environments will lead to different aspects of CQI, and the style of CQI implementation varies from organisation to organisation. Here is a synopsis of the principles of CQI (Whittle S.S. et. al., 1992, Pryor M.G. et. al., 1993).

- a) Customers have a right to expect quality products and services. Their requirements should be used as measurements for success.
- b) All results are defined by measurement and statistical analysis. Statistical process control will be the primary tool to measure the reliability of each process.

- c) Doing it right first time is the slogan of quality.
- d) The CQI goal is to enable every worker and system to successfully perform their intended functions. It is important to develop a holistic, system approach to problem-solving, and understand how the individual processes tie into the overall system.
- e) The strength of CQI is the "incremental development" rather than revolutionary breakthroughs. It is crucial to analyze current processes, to understand and document existing processes, and to transfer best practices across the company.

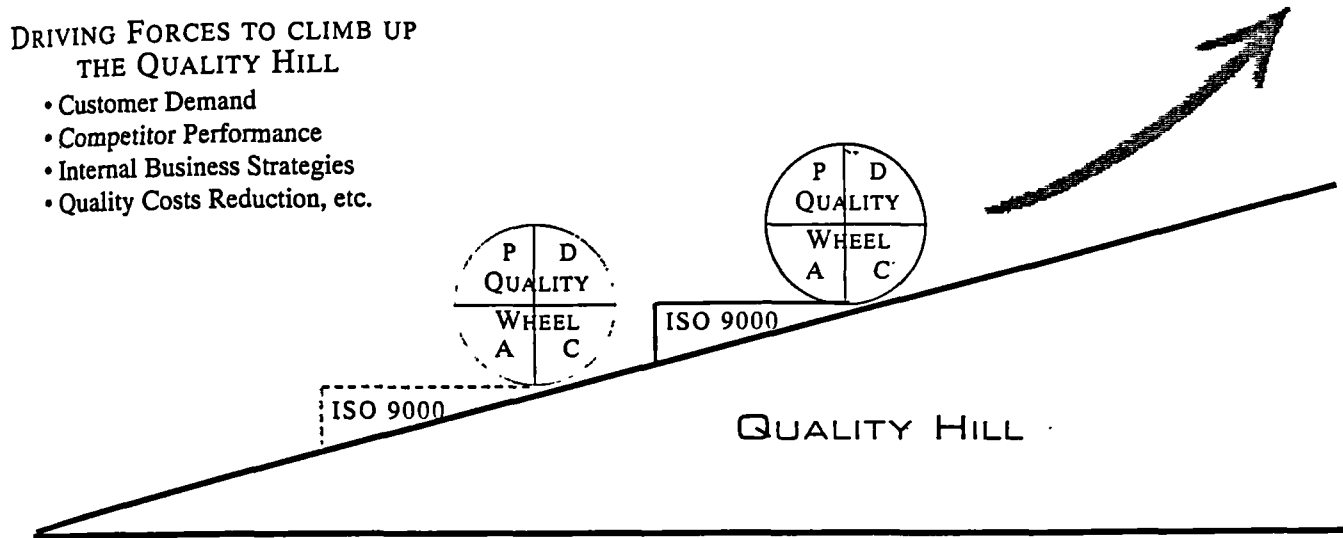
IV.1.2 The ISO9000 Platform for CQI

ISO9000 sets out a procedural framework to establish, document and maintain quality systems, and serves as guidance to the management and the concerned personnel for attaining consistent quality assurance practice throughout the company (BSI, 1987 & Rothery B., 1991). It requires clearly stated objectives for an organisation's major functions, including marketing, sales, product design, engineering, production, quality, training and so on. These functions have direct or indirect impact on the quality of products and services to customers. All procedures for quality-related activities are to be written, consolidated and documented in a quality manual.

As ISO9000 establishes a framework for assuring consistent quality performance in companies, it has formed a "wedge" to support the CQI practices. Figure 21 illustrates the relationship between ISO9000 and CQI. Customer demand, competitors' performance, internal business strategies, quality costs reduction, etc. are among the main driving forces to push the "Quality Wheel" upward on the "Quality Hill", thus enhancing the quality level. This process of enhancing a company's quality level is CQI. Once a higher quality

level has been attained, ISO9000 is essential to maintain the achievement just like a wedge to "stop" the rolling-down of the "Quality Wheel".

Figure 21: ISO9000 As a Wedge to Support CQI in the Improvement Process



As illustrated in figure 21, the Plan-Do-Check-Act (PDCA) cycle repeatedly drives the "Quality Wheel" upward. Ideally, each repeat of the cycle will gain improvement in quality. At the end of an improvement cycle, there are two choices: put the improved process under control or start another improvement-cycle. The choice is determined by the nature of the current project and other priorities. In either choice, the established ISO9000 system contributes to maintain the improvements that have been achieved, otherwise it would be easy to slip back to the old practices and lose the improvement gains. Proper training and documentation are crucial to help retain the gains. Hence, the quality system built upon ISO9000 contributes significantly to facilitate the CQI implementation.

IV.1.3 CQI as a 'Beyond ISO9000' Strategy

As discussed, ISO9000 should be adopted prior to the launching of the organization-wide CQI programme in order to maximize the CQI effectiveness. While ISO9000 series have been widely accepted in Hong Kong, it is the time to promote CQI as a 'Beyond ISO9000' strategy for the next quality campaign. It is vital for the HK manufacturers to be aware that quality cannot be improved solely by the imposition of ISO9000. The commitment to CQI is required especially for those ISO9000 certified companies. The current ISO9000-CQI situations in HK are reported as follows:

IV.2 CURRENT ISO9000-CQI PRACTICES IN HONG KONG

IV.2.1 Survey on ISO9000-CQI

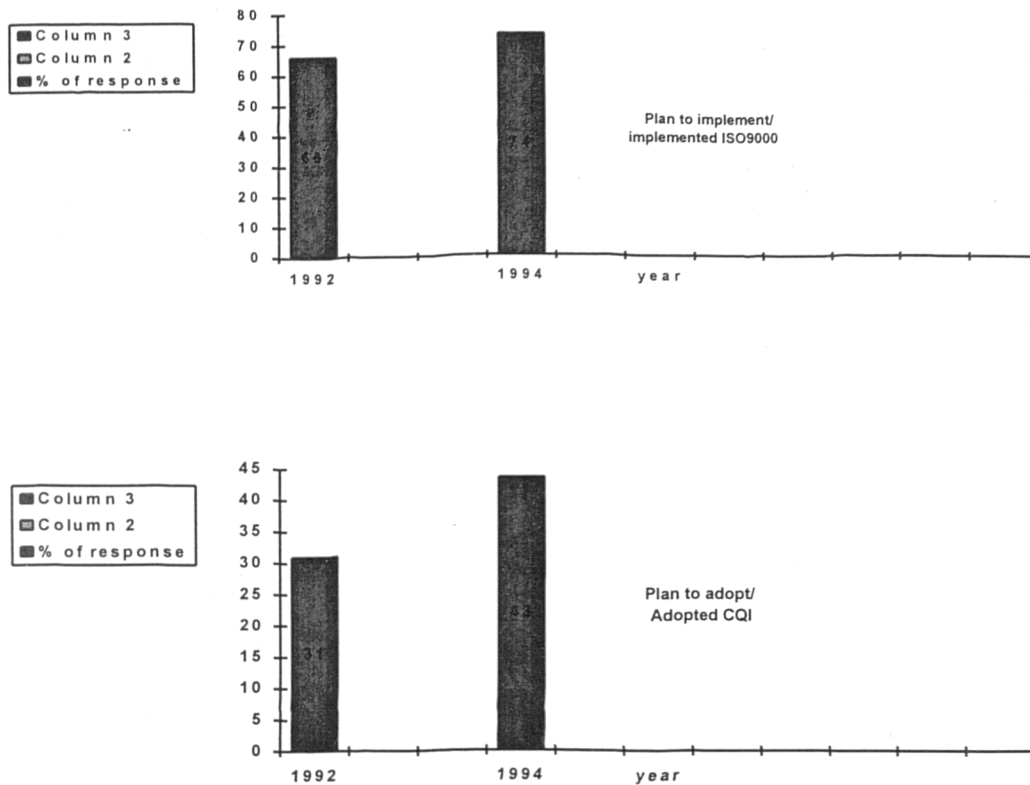
Surveys have been carried out in 1992 and 1994 to investigate Hong Kong manufacturers' awareness and acceptance of implementing ISO9000 and beyond. The main findings of the surveys are summarized in table 17:

	<u>1992</u>	<u>1994</u>
a. Plan to implement / implemented CQI		
- general	31%	43%
- ISO9000 certified companies	-	70%
b. ISO9000 as ultimate quality goal		
- general	64%	42%
- ISO9000 certified companies	-	11%
c. 'Beyond ISO9000' quality strategies		
- CQI	-	70%
- Supplier & customer relationship	-	59%
- Concurrent Engineering	-	37%
- Manufacturing automation	-	37%
- Product Variety	-	26%

Table 17: Summary of ISO9000-CQI Surveys in Hong Kong 1992-1994

For easy reference, the adoption of ISO9000 and CQI in 1992-94 are as follows:

Fig. 22: The ISO9000-CQI movement in Hong Kong(1992-1994)



Between 1992 and 1994, the adoption of ISO9000 rose from 66% to 74% whereas the CQI acceptance increased from 31% to 43%. Only 11% of the ISO9000 certified companies consider ISO9000 as their ultimate quality goal. This low percentage, as compared with the 42% in average (including companies without ISO9000 certification), reveals that most of the ISO9000 certified companies are searching for 'Beyond ISO9000' strategies to further enhance their quality. Among the five different 'Beyond ISO9000' quality strategies, CQI is ranked no. 1 by most Hong Kong manufacturers.

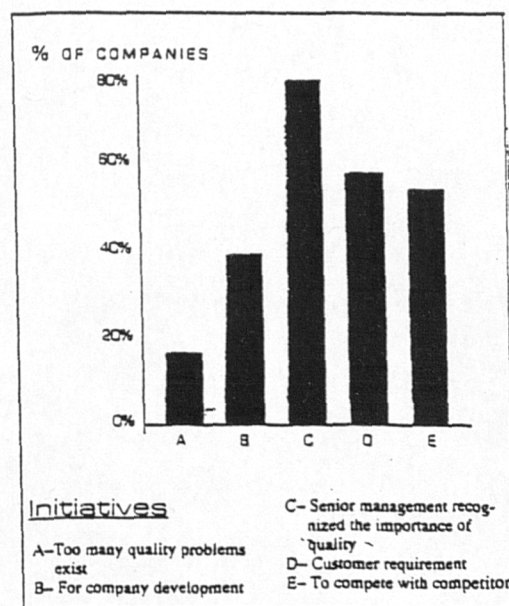
In order to obtain a better insight of the current CQI practices in Hong Kong, 14 manufacturers with formal CQI programs were selected for interviews. 12 companies have

already been ISO9000 certified while the other 2 are at the final stage of the ISO9000 certification process. Some major findings are worth discussing as below:

IV.2.2 Initiatives for CQI

The most common type of initiative is the senior management's recognition of the needs for continuous quality improvement after achieving the successful implementation of ISO9000. Fig. 23 shows the distribution of initiatives of the CQI programmes:

Figure 23 : Distribution of Initiatives of CQI, 1994 Survey

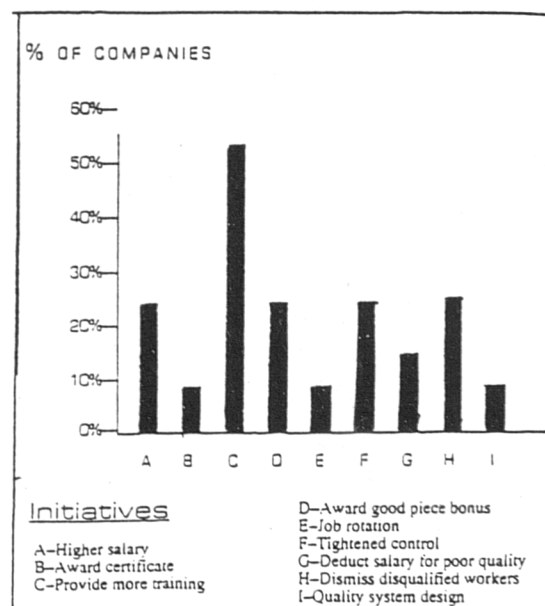


IV.2.3 CQI in China

The ISO9000 movement has indeed improved the quality awareness of Hong Kong manufacturers. Most of the studied companies accepted quality as a good manufacturing

strategy even for low cost manufacturing. About 60% of the studied companies have established manufacturing plants in China while all the remaining are in the process of setting up their PRC plants. Most of these companies have plans to launch ISO9000 system in their PRC plants after they have successfully obtained ISO9000 certification in Hong Kong. A quarter of these companies have already got the certification of their PRC operations. Moreover, it was found that CQI has also been adopted in some of the PRC plants. The implementation of CQI in China is similar to that in Hong Kong, and the main difference tends to be the ways to deal with workers' needs. Psychological awards, such as certificates or recognition, are more effective in Hong Kong while monetary award is the major motivating force in China. In addition, training was found to be the most popular way to motivate PRC workers in CQI as shown in figure 24. The quality manual in ISO9000 system was considered the most useful aid for training.

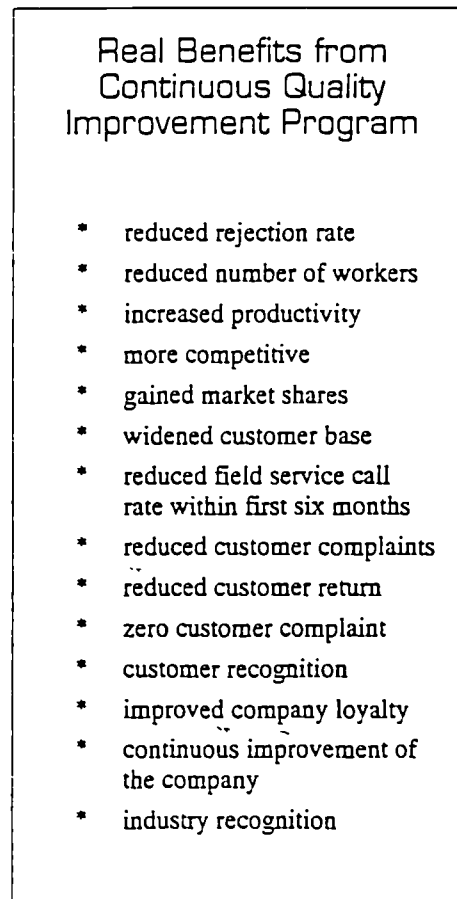
Figure 24 : Incentive Methods for CQI in China, 1994 Survey



IV.2.4 Benefits from CQI

Nearly 80% of the studied companies expressed the opinion they had achieved part of the potential benefits listed in figure 25 through CQI, although it varied from company to company.

Figure 25 : Potential Benefits from CQI, 1994 Survey



V. Quality Management Practices In HK/China Manufacturing Industries In 1995

A survey was conducted in 1995 to find out the status of the current quality practices in HK/China manufacturing industries. In the survey, the existing quality practices of Hong Kong operations were compared with those in China. The status of ISO 9000 certification, the quality strategies beyond ISO 9000 and the long term quality management development in HK/PRD manufacturing industries were reviewed. The findings are summarized as follows:

- Quality management practices in Hong Kong/China
- ISO 9000 system and “beyond ISO 9000” practices
- Future development in quality management

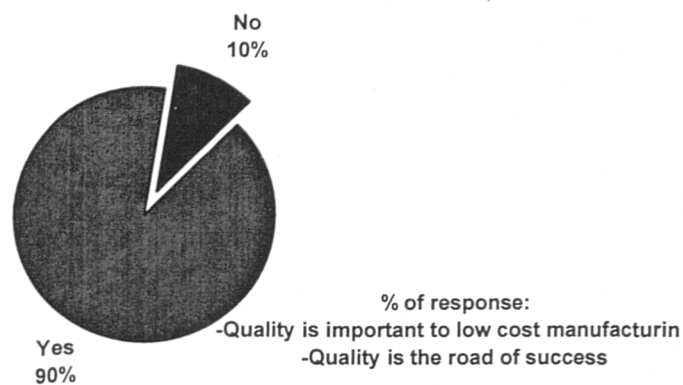
V.1 Comparison of Current Quality Management Practices between HK/China

V.1.1 Quality attitude

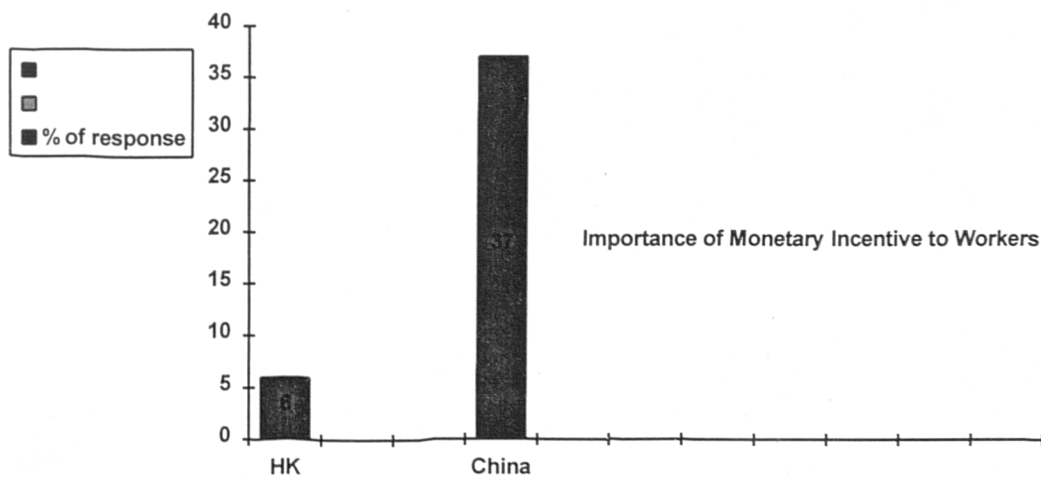
Quality attitudes in manufacturing	Percentage	
	HK	China
• Is quality important for low cost manufacturing products ?		
--- Yes	89%	87%
• Is quality the road to success in Hong Kong and China manufacturing ?		
--- Yes	90%	91%
Means of introducing good quality attitude to workers?		
a. more monetary incentive	6%	37%
b. more benefits	22%	14%
c. more training	45%	20%
d. others	3%	8%

Table 18 : Quality attitudes in HK/China manufacturing industries, 1995 Survey

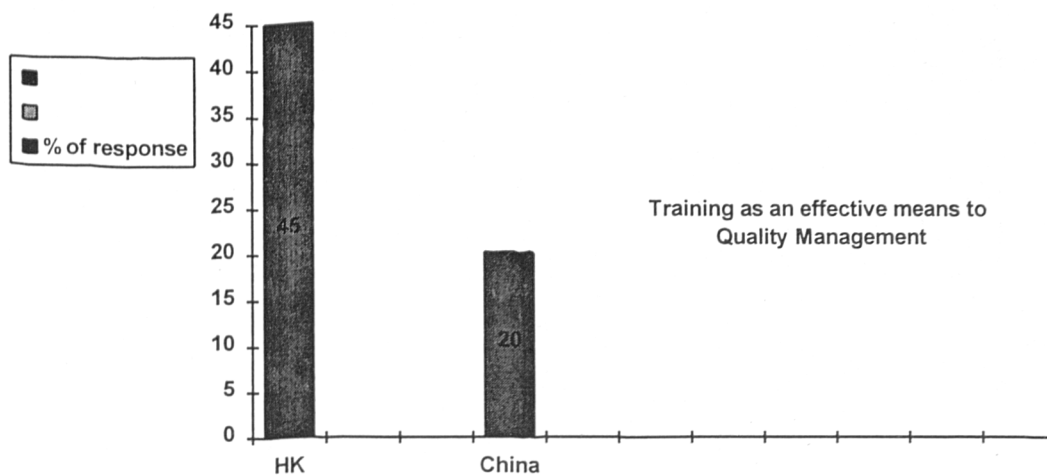
Table 18 shows that most manufacturers in HK and China understood that 'quality is important for low cost manufacturing products' and 'quality is the road to success'. Same as previous finding, the most popular means of introducing good quality attitudes to workers in China was monetary incentive whereas training was the most effective means used in Hong Kong. The Importance of quality to HK/China manufacturers is best illustrated as follows:



The important aspects of HK/China quality management practices are as follows:



Source: 1995 Survey



Source: 1995 Survey

V.1.2 Role of Hong Kong in Enhancing Quality Management in China

Role of Hong Kong in quality management	Percentage
<ul style="list-style-type: none"> Quality practices transferred from HK to China plants ? <ul style="list-style-type: none"> --- Yes 	73%
<ul style="list-style-type: none"> HK as quality management transfer catalyst for China's operations ? <ul style="list-style-type: none"> a. Train quality staff in HK and transfer them to China b. Provide quality management training to manager in China c. Send quality management professional to China to implement quality management. d. Others 	19% 59% 21% 4%

Table19: Role of HK as quality management transfer catalyst for China, 1995 Survey

73% of the respondents had transferred quality management practices from Hong Kong to their China operations. When analyzing the role of Hong Kong manufacturers in enhancing quality management practices in China, 'provide training to managers in China' was the most popular response followed by 'send quality professional to China' and 'train quality staff in HK and transfer to China'.

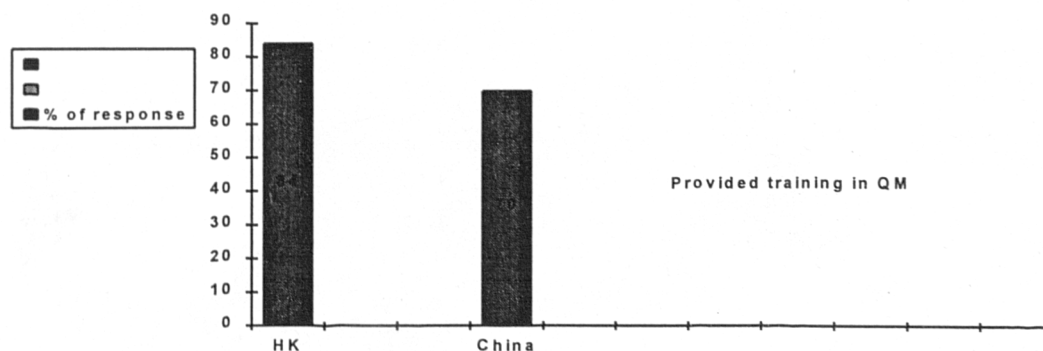
V.1.3 Quality Management Training

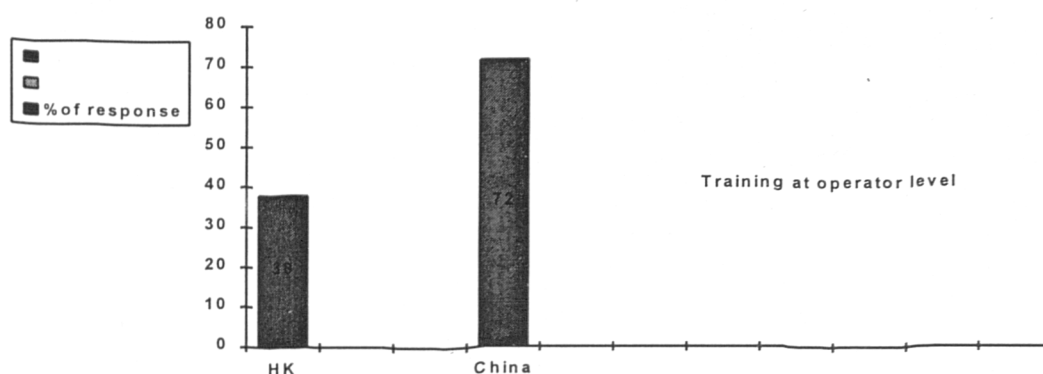
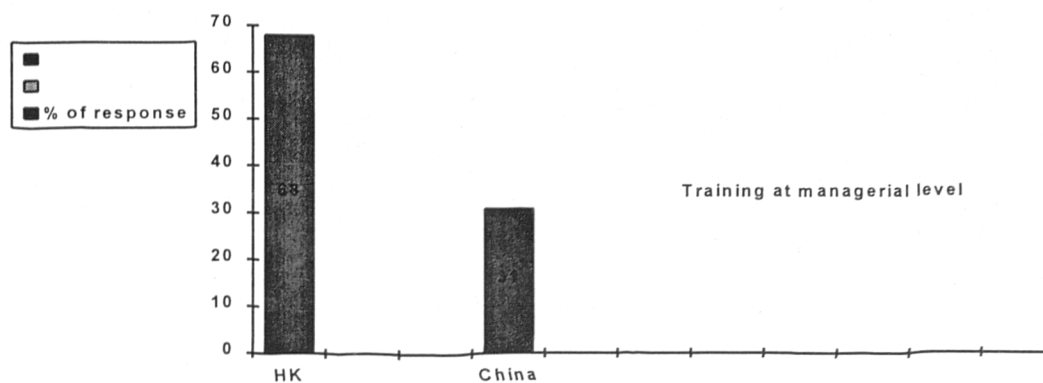
A high % of respondents, 84% in HK and 70% in China, provided training in quality management for their staff in both HK and China. Hong Kong companies provided more training in ISO9000 and leadership etc. at managerial and supervisory levels whereas China provided more technical training at operator level.

Training of quality management	Percentage	
	HK	China
• Have training in quality management ?		
--- Yes	84%	70%
• Level of employees that training provided for ?		
a. Management level	68%	31%
b. Supervisor level	75%	40%
c. Staff level	48%	44%
d. Operator level	38%	72%
• Type of training that company provided for ?		
a. ISO 9000 system	65%	39%
b. Leadership skills	70%	30%
c. Making decision	42%	19%
d. Problem solving	36%	22%
e. Team work	29%	43%
f. Communication skills	33%	49%
g. Technical know- how	15%	48%
h. Others.	4%	5%

Table 20 : Quality Management Training Provided by Company, 1995 Survey

Following Figures highlight some of the important findings in QM training:





Source: 1995 Survey

V.2 Comparing the "ISO 9000 Practices and Beyond" in HK/China

V.2.1 ISO 9000 in Hong Kong/China

Status of ISO 9000

Percentage

	HK		China	
	SME	Large	SME	Large
• ISO 9000 certified ?				
--- Yes	46%	75%	40%	40%

In Hong Kong, 75% of the large respondents had ISO9000 certification whereas only 46% of the SMEs were certified. In China, the % of respondents holding an ISO9000 certificate was 40% for both the large and the SMEs.

Status of ISO 9000	Percentage	
	HK	China
• ISO 9000 certified ?		
--- Yes	65%	40%
• Why ISO 9000 certification is considered ?		
a. Conform customer's requirement	96%	97%
b. Maintain competitiveness	69%	70%
c. Promote company's public image	33%	26%
d. For better quality or services	56%	47%
e. Diversifying export	7%	3%
f. Under pressure of European Community	5%	3%
• Why not consider ISO 9000 certification ?		
a. Too much limitation in ISO 9000	67%	49%
b. Tradition quality system hard to change	37%	41%
c. Complicated ISO 9000 process	27%	23%
d. Others	10%	15%

Table 21 : Status of ISO 9000 for plants in Hong Kong and China, 1995 Survey

The overall certification % was higher in Hong Kong(65%) than China(40%). Regarding the reasons for adopting ISO9000 certification, almost all respondents, both HK and China, considered 'conformance to customer's requirements' as the prime reason, followed by 'maintain competitiveness' and 'for better quality services'. The reasons for not adopting ISO9000 were 'too much limitation', 'not easy to change' and 'complicated process'. Once again, the responses were similar in both HK/China.

V.2.2 Difficulties and benefits of ISO 9000

Respondents had expressed difficulties in almost all items listed in Table 22. The difficult task expressed most in both HK/China operations was 'documentation'. More SMEs in both HK/China expressed difficulties in getting top management support than the large companies(40% versus 20%). More large companies had

difficulties in communication than the SMEs(40% versus 20%). Clearly defined accountability/responsibility and traceable defects were the benefits reported most by respondents. The difficulties and benefits expressed in both HK and China operations were similar.

Difficulties and benefits of ISO 9000	Percentage	
	HK	China
• Difficulties		
a. Suitability of ISO 9000	25%	29%
b. To ensure everyone follows the rules	31%	26%
c. Difficult to document	58%	47%
d. Difficult to provide staff training	31%	24%
e. Lack of quality awareness from staff	29%	18%
f. Lack of top management support	27%	29%
g. Poor communication	33%	32%
h. Too much paper work	4%	---
I. Others	5%	8%
• Benefits of implementing ISO 9000		
a. Clearly defined accountability or responsibility	55%	41%
b. Traceable defects	58%	53%
c. Prevent nonconformity in the process	36%	32%
d. Better information flow	25%	35%
e. Better communication	43%	32%
f. Others	2%	3%

Table 22 : Difficulties and benefits of ISO 9000 systems, 1995 Survey

V.2.3 Beyond ISO 9000

Questions were asked about the status and practices of Continuous Quality Improvement (CQI) as beyond ISO9000 quality strategy in HK and China. Table 23 shows the summary results:

Status of Continuous Quality Improvement (CQI)	Percentage	
	HK	China
• Implemented Continuous Quality Improvement (CQI) ?		
• --- Yes	40%	23%
Benefits from CQI?		
a. Reduced rejection rate	76%	58%
b. Reduced number of worker	44%	47%
c. Increased productivity	53%	47%
d. Gaining market shares	32%	21%
e. Reduced customer complaints	32%	21%
f. Others	3%	5%

Table 23: CQI Status for plants in Hong Kong and China, 1995 Survey

40% of Hong Kong respondents, mainly from large companies, had implemented CQI and the % in China was only 23%. More HK and China respondents found that the benefits of CQI were 'reduced rejection rate' followed by 'increased productivity' and 'reduced number of worker'.

V.3 Future Development

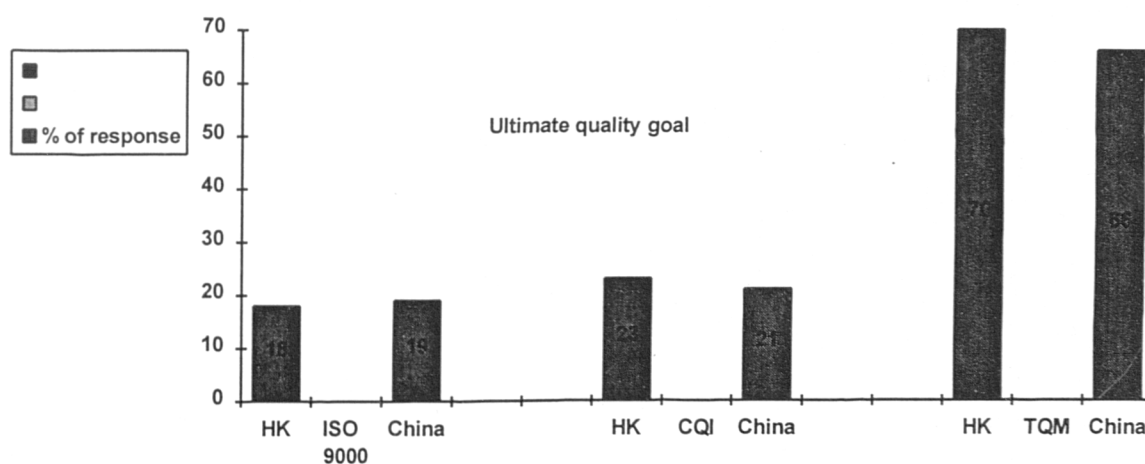
Over 80% of the respondents, both in HK and China, did not consider ISO9000 as their ultimate quality goal. However, the majority of the respondents considered that CQI could be the means for them to achieve TQM. TQM was considered as the actual ultimate quality goal for most respondents in the long term.

Ultimate quality goal	Percentage	
	HK	China
• Is ISO 9000 the ultimate quality goal for manufacturing industries ?		
--- No	82%	81%
• The ultimate quality goal:		
a. No quality system	---	3%
b. Continuous Quality Improvement (CQI)	23%	21%
c. Total Quality Management (TQM)	70%	66%
d. Your own quality system	3%	4%
e. Others	4%	4%

Table 24: Ultimate Quality Goal of Hong Kong/China Manufacturers, 1995 Survey

The ultimate quality goal of HK/China manufacturers are summarized as follows:

Fig.26: Ultimate quality goal of HK/China manufacturers, 1995 Survey



V.4 CONCLUSION

Hong Kong manufacturing industries have reached their critical industrial transformation stage, i.e. shifting from low cost to high value-added manufacturing. A complete cultural change and restructuring of the traditional practices are required. In order to survive, Hong Kong manufacturers need to maintain their competitiveness through quality improvement. With the

introduction of ISO9000 systems, the quality movement in Hong Kong has been reasonably successful in recent years. More and more manufacturers in Hong Kong and China have obtained ISO 9000 certificates. However, because of the inherent difficulties and limitations in ISO 9000 systems, many HK/China manufacturers are looking for quality strategies "beyond ISO9000". Consequently, Continuous Quality Improvement (CQI), a never ending process to improve quality, is becoming popular in Hong Kong.

ISO9000 standards set a good baseline for quality improvement to be built upon. CQI integrates and co-ordinates different organizational functions effectively on continuous basis for pursuing total corporate quality goals. The importance of CQI has been increasingly recognised by Hong Kong manufacturers as an essential component to climb up the "Quality Hill". Some leading manufacturers have been putting their efforts in implementing CQI and extending this practice to their plants in China. With the success of the ISO9000 movement, CQI will become the prevailing quality campaign next to ISO9000 in Hong Kong and contribute more to the synergy of Hong Kong/China manufacturing industries by transferring the established quality practices to China. For long term quality improvement, Total Quality Management (TQM) is considered by many manufacturers in HK/China as their ultimate quality goal.

Existing quality management practices in China is inappropriate and inadequate. Managers in China have not been given sufficient opportunities to be trained and

educated in quality. The centralized planned economy has no concept of customer. In China, everything was centrally distributed according to a plan in the past. There was little chance for civilians to make their requests. Chinese people have been getting used to this authoritative system for decades. Changing this attitude is not easy. Fortunately, since the open door policy, many Chinese people have already tasted the benefits of the market system. The concept of customers has been evolved and is becoming more and more important. Furthermore, the general standard of living in China is still well below Hong Kong. Monetary incentive, the basic level of Maslow's hierarchy of needs, works pretty well in China. Almost all people are eager to get jobs in the Hong Kong based companies because the salary level is several times higher than the average local enterprises. Staff and workers are very keen and highly motivated. The problem of introducing and implementing quality management and systems in China is not on 'they don't want to do it', the problem is 'they don't know how to do it'. Experiences in China show that most workers will just follow the instruction and have a strong desire to learn. Training is usually very effective in China and resistance to change is very minimal. Hong Kong firms should provide appropriate and adequate training to China starting from the top management and extending to all levels of employees. It is very important that quality concepts be introduced to China as early as possible. The current concept of quality education is to introduce 'quality' in the primary school. Since China's manufacturing industries are still at their infant stage, most people have not yet been polluted by the bad practices in the market system. This would be the best time to introduce quality concepts and practices.

At present, most Hong Kong firms only introduce quality management to their China operations by simply transferring their existing practices in Hong Kong. Many of the Chinese firms are still relying heavily on the quality support from their host companies in Hong Kong. They have not yet built up their own strengths in quality. The role of Hong Kong to enhance quality management in China should be more than just 'to transfer' but also 'to diffuse' quality concepts and practices to China according to the actual needs and special situation in China. Hong Kong manufacturers should help their Chinese partners to build up their own quality capability. The most effective way is to convince top management and to get their strong support in multiplying the quality concepts and practices to all level of employees. The HK quality journey i.e. the "ISO9000 to ISO9000-CQI and eventually to TQM", would also be a very good model for China to climb up its quality hill.

CHAPTER 5: NEW PRODUCT AND HIGH TECHNOLOGY DEVELOPMENT STRATEGIES FOR HK/CHINA MANUFACTURING INDUSTRIES

I. Introduction

In response to the shortening product life cycle time, the ever changing customers' requirements for greater product variety and higher product quality, Hong Kong manufacturers are required to undergo substantial strategic changes. Reliance on low cost and labor intensive manufacturing is no longer adequate to be competitive in the global market. Hong Kong manufacturers need to move from a low-cost manufacturing bias to customer-oriented, high quality and marketing/technology integrative emphasis. Hong Kong manufacturers are striving to adopt two basic approaches:

1. The 'high value-added new product development strategy' by focusing on proactive, quality and the Time-To-Market(TTM) emphasis, and
2. The 'process automation strategy', to enhance competitiveness.

This chapter reviews the new product and technology development strategies in HK/China and the contribution of these strategies to the development of the HK/PRD manufacturing industries. The current status of new product development in Hong Kong will be reviewed and the suitability of different product development approaches are evaluated. The situation of high technology development in Hong Kong will be investigated and the role of HK in developing new technology and high value-added products in HK/China manufacturing industries will be elaborated.

As a result of moving the low-cost manufacturing from HK to PRD, the total

manufacturing capacity in HK/PRD region has been expanding extensively. Hong Kong manufacturers need to take this rapidly expanding opportunity of not just adding on more low cost facilities, but also improving technology and new product development capability. Hong Kong is in a good position to be developed as a high technology, new product design and manufacturing support centre for the HK/PRD region. There are many strategic choices for Hong Kong manufacturers in improving product and process technology competitiveness, they are:

1. Maintain low-cost manufacturing by improved productivity and quality, Or
2. Acquire new skills to provide new features and services of higher value products, and become more responsive to market and customers' needs, or
3. Step into the high value-added, short product life cycle and rapidly changing customer demand territory by emphasizing the whole spectrum of quality customer-oriented operations with market research, TTM(Time-To-Market) product design and advanced manufacturing processes.

By reviewing carefully their internal strengths and weaknesses as well as the external opportunities and threats, HK manufacturers need to identify the most appropriate strategies for their own future development.

II. An Overview of New Product Development Strategies in Hong Kong

II.1 The Need for Effective Product Development

Today's keen global competition, rapid technological change, and shifting patterns of world markets force the Hong Kong manufacturers to strive for competitive product development. For survival in present global market, companies should increasingly entice

potential customers with products of better quality and lower price (Boznak & Decker, 1993). They should also introduce new products faster than their competitors. Due to the escalating land and labour costs, Hong Kong is no longer a low-cost manufacturing center (Yam et.al., 1993 & 1994). Effective product development is a must rather than an option for Hong Kong manufacturers (Davis, 1992). New international initiatives such as ISO9000 are also mandating manufacturers to conform to verifiable product development standards before their products or services can be sold to international markets. There is neither 'quick fix' nor 'turnkey' solution available for competitive product development. Some literature advise reducing product development cycle time to meet competition more quickly (Smith & Reinertsen, 1991; Carter & Baker, 1992.). Others recommend embracing project management (Turtle, 1994), designating a product champion or forming cross-functional teams (Wheelwright & Clark, 1992; Funk, 1992; Kengi, 1993). Still others suggest following the best practices in an industry (Bogan & English, 1994), or becoming customer driven and employing total quality management (Wheelwright & Clark, 1992; Boznak & Decker, 1993; Gevirtz, 1994).

II.2 The Trend of New Product Development Strategies in Hong Kong

A survey was conducted in 1992 to review the product development strategies in Hong Kong manufacturing industries. Profit and commercial performance were underlined by all the studied Hong Kong companies as the prime criteria to assess the success of a new product. There was a consensus that product performance, quality and delivery on time were the pre-requisites to successful new product development. All the studied companies agreed and committed that "Cost, Quality and Time-to-market are the three competitive

weapons in winning the marketplace in the 1990s". The following three approaches in new product development were experimented with by the Hong Kong Manufacturers:

i) *Proactive Approach*

'To be reactive or proactive' is always one of the basic strategic product development decisions facing Hong Kong manufacturers (Urban et.al., 1987). A reactive approach focuses on to wait for the competitors to introduce a new product and copying it if it is successful. A proactive approach explicitly allocates resources to identify and seize opportunities. It concentrates on technology R&D and consumer marketing. It pre-empts competition by being first to the market with innovative products that competitors are difficult to match. As concluded in John & Snelson's study (John & Snelson, 1990) on the American and British companies, nearly all (90%) successful companies pursued a proactive approach in new product development aiming at to lead product changes rather than to follow. Hong Kong manufacturers also realize the limitation of their traditional reactive approach. The imitative and responsive OEMs (*Original Equipment Manufacturers*) strategies are no longer effective in today's rapidly changing environment. HK manufacturers start to take active role in developing new products and markets.

ii) *Right-First-Time Approach*

To sustain competitiveness, a market-oriented business should continually develop innovative, high-quality products faster and cheaper than its competitors. To achieve these, companies should aim at "right-first-time development" at strategic and operational levels to ensure doing the development and operational works right at the first time (Boznak & Decker, 1993; Gevirtz, 1994). For instance, identifying customer needs without missing

any of the critical customer requirement at the product conceptual phase is essential to the success of a new product. Failing to select a right manufacturing process at the first time could also lead to substantial increases in production cost and cause unnecessary delay to product's Time-to-market.

iii) *Time-To-Market Approach*

Many researchers advocated that the emphasis of manufacturing companies in the 1990s would be how to speed up the development process of a new product (Joseph, 1990; Carter & Baker, 1992; Philip & Paul, 1991; Sprague et.al., 1991). Or speaking in terms of time, how to reduce the 'Time-to-market'. The term 'Time-to-market' is generally defined as the elapsed time between product definition and product availability. Many competitive advantages can be accrued from a fast product development cycle. If a product is introduced earlier, the product's life cycle is usually longer with extra revenue and profit. A good quality and early entry product often gains more supports from customers. With the build-up of customer loyalty, the product would not be replaced or substituted easily by another one. Moreover, early product introduction can increase market share and profit margin due to less competition at the introduction stage. The importance of this "Time-to-market" approach has been recognized by some Hong Kong manufacturers. TTM concept has slowly become more popular among Hong Kong manufacturers for improving competitiveness.

II.2.1. Proactive Product Development Strategy

Traditionally, HK manufacturing industry is low-technology-based and labour-intensive. HK manufacturers are conservative to develop technological products because of high risk and lack of expertise and government supports. The investment in R&D is the lowest as compared with competitive countries (Yam, 1992; Yam et.al., 1993 & 1994). An imitative strategy based on quickly copying a new product from competitors have been adopted in HK for years. Moreover, a certain percentage of the HK manufacturers, particularly the SMEs, are mainly operating under the “manufacture to customer’s design” type of business. They do not have their own product design function. Most of the designs come from their customers. With the fading low-cost advantage and the rapid market changes, there is not sufficient time for the imitative approach to react. HK manufacturers are aware that the imitative strategy is no longer effective. They also realise that a proactive approach in product development will make their business more successful in the long run.

It is also noted that some other factors are encouraging the Hong Kong Manufacturers in adopting the proactive approach. There are some changes in the Hong Kong government's attitude toward supporting Hong Kong manufacturing industries. Hong Kong Government has recently implemented various direct and indirect policies to support local companies to pursuit high-technology industry development. These include : the expansion of tertiary education especially in scientific and technological areas, the establishments of the Industry and Technology Development Council, the Hong Kong Technology Centre, the Industrial Estates, and the financial funds for a number of applied research projects in new technology development. In approaching 1997, China will become an important

contributor to Hong Kong's technological development. Hong Kong manufacturers can finance and commercialize the Chinese technological research results, and make use of China's strong research and development base to develop the high technology manufacturing in Hong Kong. There is a general consensus among all the respondents in the survey that in the 1990s, all the successful new products must be customer-oriented. Regarding the perception of customer satisfaction, a toy company, Varicraft Manufactory Limited commented that:

- * *'Customers are not always right.' We have to correctly interpret and perceive customers' ultimate need, not just the requirements laid down by them. To satisfy a customer, meeting the customers' requirements is not enough. Instead, fulfilling customers' expectation (their ultimate need) should be the ultimate target. The target of our company is to go 'beyond' customers' expectation.*

Hong Kong manufacturers are well aware of the importance of providing customer satisfaction. To correctly understand customers' needs, most of the companies in the survey suggested that frequent direct contact with the customer was the best channel.

II.2.2 Quality-Focus Product Development Strategy

Most Hong Kong manufacturers are aware of the importance of emphasising quality during the product design stage in developing quality products towards customers' satisfaction. As reported previously, ISO9000 has become very popular and the concept of quality assurance has well been accepted by Hong Kong manufacturing industries. This international standard encompasses a quality system for the entire product development and commercialization effort. Most of the studied companies relied on a good quality

system to reduce both time and cost in new product development. Nevertheless, the majority said that trade-offs decisions often appeared among quality, cost and TTM.

II.2.3 Time-To-Market Product Development Strategy

TTM is a rather new concept for the Hong Kong manufacturing industry. As shown in Table 25, 24% of respondents do not know the TTM concept. Among the 33 companies in the categories of implementing or planning to implement TTM, 13 of them (39%) are foreign companies. Based on the successful experience of their parent companies, they have quickly implemented the TTM strategies. Comparatively, local manufacturers are slow in adopting the TTM. Moreover, large companies have gradually shifted to focus on market/product-oriented approach, they tend to adopt TTM more positively than small companies($X^2 = 18.1$ significant at the 0.01 level). Many small manufacturing firms are still acting as subcontractors of large companies through the OEM arrangement. TTM, in this case, is less beneficial to them.

Table 25 : Acceptance of TTM by HK Manufacturers, 1992 Survey

			Breakdown by Investment Source		Breakdown by Company Size	
	No.	%	Overseas	Local	L	S&M
(1) Realize the TTM benefits and implementing it in Companies.	21	28.4	6	15	11	10
(2) Realize the TTM benefits and planning to implement it.	12	16.2	7	5	7	5
(3) Know TTM concept but no special plan to implement it.	23	31.1	0	23	13	10
(4) Do not know TTM concept.	18	24.3	0	18	0	18
Total	74	100	13	61	31	43

Although most of the respondents in our survey appreciated the benefits of being a market pioneer by quick entry into the market, they also emphasized that determining appropriate market entry time and identifying customer response to new products were more

important than merely having a faster development cycle. A typical comment from most respondents(62%) is:

- * *'The fastest is the best' is not always true in product development. The vital importance is to deliver the right product at the right time (the time when customers have already had the awareness and the acceptance to the technology and price).*

Those companies that emphasizing on TTM concept put their efforts in shortening the product development cycle by reducing delays in launching new products. The typical common causes of delays quoted by those who knew about TTM concept are:

- * *communication*
- * *uncertainties in R&D*
- * *definition of product :*
 - wrong initial judgement*
 - modification needed due to market changes*
- * *redesign looping due to :*
 - design errors*
 - poor design for manufacture*
 - poor design for quality*
 - sequential approach*
- * *priority problems with other projects*

Common techniques used by the 21 respondents, who have implemented TTM, to shorten product development cycles are listed in Table 26. These techniques can be broadly divided into two categories, i.e. the organizational/managerial approach and the technology/tools approach. Comparatively, the organizational/managerial approach is

more popular among respondents.

Techniques for reducing TTM	No. of Companies (%)
Organizational/managerial Approach :	
1. Overlapping Product Development Process	21 (100)
2. Cross-functional Design Teams	21 (100)
3. Employee Training	21 (100)
4. Matrix Organization	3 (14.3)
5. Total Quality Management (TQM)	21 (100)
6. Supplier Involvement	9 (42.9)
Technology/Tools Approach :	
7. CAD/CAM & Network	21 (100)
8. Rapid Prototyping	13 (61.9)
9. Computer-aided Engineering	7 (33.3)
10. Computer-aided Process Planning	6 (28.6)
11. Manufacturing Simulation	6 (28.6)
12. Standard Procedures / Checklists	21 (100)
13. Design for Manufacture & Assembly Software (DFMA)	5 (23.8)
14. Quality Function Deployment	9 (42.9)
15. Taguchi Method	6 (28.6)
16. Failure Mode and Effects Analysis (FMEA)	6 (28.6)
17. Value Engineering	9 (42.9)

Table 26 : The Techniques Used to Reduce TTM by HK Manufacturers, 1992 Survey

For those respondents who knew the TTM concept but had no special plan to implement it, they commented that with strong R&D support and special emphasis on Quality, product development time would naturally be reduced. They also inclined to support their existing phase-by-phase development process rather than the simultaneous process used in TTM approach. Multi-disciplinary teams were only adopted periodically, rather than continuously, by these companies at the middle management level to review the product development process. Multi-disciplinary teams were also used to approve the progress of the sequential product development cycle during the transition from one phase to the

subsequent phase. The phase-by-phase approach are still popular for the following quoted reasons from respondents:

- * *Designers and engineers are accustomed to the phase-by-phase development process, the overlapping simultaneous approach may cause unnecessary confusion.(8 incidents)*
- * *The phase-by-phase approach provides a clear-cut in accountability and responsibility of various departments involved in the entire product development process. It is good for management control.(6 incidents)*
- * *The lack of cross-functional culture in the phase-by-phase approach can be overcome by setting up review points to assess the product development progress by ad hoc multi-disciplinary teams.(3 incidents)*

III. High Technology Development

III.1 Importance of High Technology Development

Low cost manufacturers are also facing the increasing trade barriers imposed by developed countries to protect their own basic manufacturing activities. For instance, US has sought to control textile and apparel imports either by introducing import tariffs or by directly limiting the quantity imported via a quota system. Technology upgrading is a growing strategy to overcome protectionism. At present, high value-added manufacturing through technology seems to be the most fruitful approach in the Pacific Rim. Countries like South Korea, Taiwan and Singapore are intensifying their technological efforts. Most of them have achieved considerable success, although results

vary according to sector and countries.(Yam C.M., 1992)

III.2. High Technology Development in Hong Kong

III.2.1 Value-added Performance Between Hong Kong and Other Asia's Dragons

Comparing the value-added performance between Hong Kong and Singapore (HK Government, 1988 & Government Yearbook of Statistics, Singapore.), Singapore was 60% to 90% better than Hong Kong in terms of value-added per employee in late 1980s. There is obviously lots of room for improvement in HK manufacturing industries. Another study has shown that South Korea and Taiwan were 25% and 50% higher than Singapore and HK respectively on the use of automation technology in manufacturing industries in mid-1980s.(APO, 1990) The gap would be even wider in the 1990s. In order to be more competitive in the global market, Hong Kong should seriously look for improvement in product time-to-market management, quality products and services with high flexibility in responding to ever changing market requirements. Hong Kong manufacturers need to focus on both product innovation and process automation to enhance the HK/PRD region's competitive edge.

III.2.2 Problems For Phasing-in New Technology in Hong Kong(Yam C.M., 1992)

Hong Kong manufacturers seldom have long term strategies or investments in new technologies and new product R&D. Coupled with the lack of government support in the past, Hong Kong is many years behind its competitors in the technology journey. Many local manufacturers don't have detailed plans for phasing-in new technologies and new products. To maintain its viability and increase its competitiveness, Hong Kong needs to

develop and export technology-based products and services. However, there are many problems associated with the technology development in Hong Kong. The 1997 issue has made Hong Kong people short sighted but R&D investment is often capital intensive with a long payback period. The tendency of talented young people to join finance and management sectors instead of manufacturing may also pose a hindrance to the R&D development in Hong Kong. Training of the available hi-tech manpower is another problem. There are no applied research institutes where science and engineering graduates can be trained in commercial research work in Hong Kong. Because of this, technical staff in Hong Kong seldom have the capability to relate technology with business. On the optimistic side, Hong Kong has hardworking, educated and flexible work forces with efficient communication and transportation facilities, low taxation, free trading and excellent banking. These help the territory to develop a sensitive market sense to cope with the world trend of globalisation and short product cycles. Also the expansion of tertiary education can lead the technology development one step further. Once Hong Kong has its own hi-tech R&D capability with manufacturing engineering it can undertake on the spot innovation to cope with the new challenges towards the 21st century. Furthermore, Hong Kong is strengthened by its proximity to China for easy access to China's raw materials, cheap land, abundant technical manpower and R&D talent. It is important that Hong Kong should build its own technology strength in co-operation with China. Hong Kong Productivity Council(HKPC) conducted an industrial automation study in 1992 and some findings concerning with product and process development are summarized as follows(HKPC, 1992):

- Resistance from employees to new ideas was reported which usually could be overcome by training.
- Some manufacturers considered the benefits of process innovation as the reduction of labour costs only.
- Many companies had difficulties in recruiting necessary technical and management expertise. The lack of skilled labour was another reason for them to automate the plants.
- Some companies encountered difficulties in handling a large variety of products with small batch size by the automated plant.
- Some had difficulties to recruit night shift skilled workers in the 24-hour operation plant .
- Many companies adopted a “wait-to-see” attitude in view of the success of their low cost manufacturing activities in China. These companies intended to rely on the low cost manufacturing in China as their long term strategy and hesitated to invest in high-value-added products and processes.
- Some companies, which intended to invest in new technology, did not know how to acquire, where to acquire and when to acquire the technology. In general, most companies experienced poor local technical support in training, maintenance, software upgrading and development from their technology suppliers.
- Most manufacturers overlooked the importance of operations effectiveness and efficiency resulting in excessive non-value-added activities in plant. Process automation was viewed by most manufacturers as a means to save labour costs or increase capacity only. The opportunities via process automation to enhance product quality and other cost saving, like improving operations effectiveness and efficiency, were often overlooked.

III.2.3. Supports from Hong Kong Government for High value-added Industries

With the Government positive non-intervention policy and the nature of the Industry, undertaking R&D in Hong Kong is easier said than done. In fact, the annual expenditure of R&D in the Western countries in the last decade was about 2.5% to 3% of their GNP. In Taiwan, South Korea and Singapore it was about 1.5% to 2.5% and in Hong Kong it was only 0.05%. Hong Kong is just about the only place in the region where the Government has not set the direction for industries and left it for the business men themselves. Government institutions are often in a better position to finance innovative projects as they are able to take a longer term view and can assume greater risks than small firms and private venture capital funds.(Yam C.M., 1992)

Government should also be more aggressive in attracting multinational companies by providing more incentives to companies which engage in R&D. The multinational companies play a key role because they bring the business, the investment, the technology and the know-how and in many cases even bring with them the support industries. If these projects are carried out on an ad hoc basis without sufficient strategic thinking and sufficient central co-ordination, all these projects may not turn out to be fully effective. What contributes to the success on developing R&D in other countries is that they have centralised bodies, heavily backed up by government to plan strategies and directions. Investment in R&D is a very private business in Hong Kong. Companies are very much left alone by the governments' non-interventionist policy. Many Hong Kong manufacturing firms are small to medium companies. They lack both the manpower and money to make

any meaningful R&D investment in high technology. The majority of Hong Kong manufacturers produce according to customers' specifications; they spend little on R&D. Only a few have the resources to spend on basic R&D. A small percentage engages in applied research and design innovation. Technically, Hong Kong manufacturers do not venture into new ideas. They are too small. They do not have the resources to compete internationally in new products and technology development. However, in recent years, Hong Kong Government has become more proactive in supporting R&D in the territory. Details of which are described as follows:

III.2.3.1 Current Support

Leaders of industry and academics have continually urged the government to play a more active role in encouraging high technology development so that the territory can compete with other fellow Asian dragons in the technology journey. As more of the territory's labor intensive industries have been shifted to Southern China, Hong Kong government has been more proactive *in doing its part to encourage the transition to* technology-based industry. The government offers industrial land at development cost for high-technology companies and provides assistance to startups in the form of matching R&D grants. There are many different forms of support to local companies for pursuing high value-added production development. These include the establishment and expansion of the following:

- The Hong Kong Industrial Estates Corporation (HKIEC) operates two industrial estates, the Tai Po Industrial Estate (TPIE) of 73 hectares of land and the Yuen Long Industrial Estate (YLIE) of 66 hectares of land, at development costs for specialized manufacturing

processes which cannot operate efficiently in conventional multistory factory buildings or which introduce new technologies to Hong Kong. HKIEC is looking for the third industrial estate site of about 100 hectares in Tseung Kwan O.

- The Hong Kong Productivity Council (HKPC) is the main industry support organization to provide a range of industrial consultancy, training, development and bureau of services to assist industry in moving up the value added ladder. Services with growing demand include product development, quality improvement, information technology application, environmental management, advanced tooling, production management and human resources development. Special demonstration centres have been set up to introduce advanced manufacturing technology: Clothing Technology Demonstration Centre, CAD/CAM Centre and Surface Mount Technology Laboratory.
- Hong Kong Government has set up specific committees under the Technology Review Board of the Industry and Technology Development Council(ITDC) to identify the chain of value-added operations of each sector in the industries. ITDC promotes product innovation and process automation by gathering the local industrial automation experts together to form a task force. This task force helps industries to solve problems in industrial automation.
- Industrial design services are presently provided by Design Innovation (HK) Ltd., established in 1986 with Government subvention. It has become a subsidiary of the HKPC in 1990.
- The Hong Kong Industrial Technology Centre Corporation was established in 1993 to encourage the growth of innovation and new technology-based businesses, and to

facilitate the transfer of technology relevant to Hong Kong's industry. The corporation also assists in the commercial exploitation of research undertaken locally. It was granted 5,600 square metres of Government land together with a \$250 million grant and \$188 million loan to fund the construction and operation of the centre.

- To encourage manufacturers to enhance their technological capabilities and competitiveness, a \$200 million Applied Research and Development (R&D) Scheme was established in February 1993. A private company called the Hong Kong Applied R&D Fund Company Limited was set up to administer the Scheme. Under the Scheme, funding support of up to half of the cost of a single applied R&D project can be granted to a single locally-registered company or organization. Funding support can either take the form of a loan or equity participation or a combination of both. Project proposals are assessed mainly in terms of their technological merit, innovation and potential for commercial exploitation.
- In order to upgrade the quality of the Hong Kong workforce to meet the demand of advancing technology, a New Technology Training Scheme was launched in June 1992 to provide assistance, in the form of a matching grant, to local companies which wish to have their staff trained in new technologies needed for Hong Kong's industrial and economic development. The scheme is administered by the Vocational Training Council and financed by the income of a fund contributed by the Government.

III.2.3.2 Universities' Efforts in Technology Development in Hong Kong

The tertiary education sector in Hong Kong is administered by the University Grants Committee (UGC). There are seven institutions being funded by the UGC. The publicly

funded institutions of higher education are working very hard to identify technology-based industries that can exploit the territory's already established manufacturing base and infrastructure of Hong Kong. They are also making use of China's vast pool of scientific knowledge and natural resources.(UGC, CityU, 1995)

Expansion of Tertiary Education

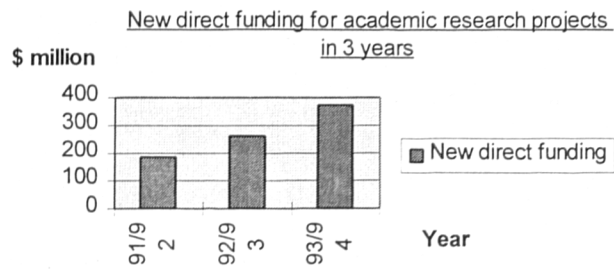
In recent years, the territory has greatly expanded its tertiary education sector. The number of faculty members in science and engineering has soared in Hong Kong. The new Hong Kong University of Science and Technology was opened in 1991, the two polytechnics and a post-secondary college were upgraded to university status in 1994. The link between industry and academia is traditionally strong in the field of engineering as both sides share a common interest. Tertiary institutions prepare graduates for their engineering careers, industry helps to train and retain a continuous supply of engineers in the form of on-the-job training and skill development.

Research Funding/Output and Postgraduate Studies by Research

New Direct Funding for Academic Research Projects in 91/92, 92/93 and 93/94: The new research funding increased from HK\$183 millions in 91/92 to HK\$373 millions in 93/94(UGC, CityU, 1995);

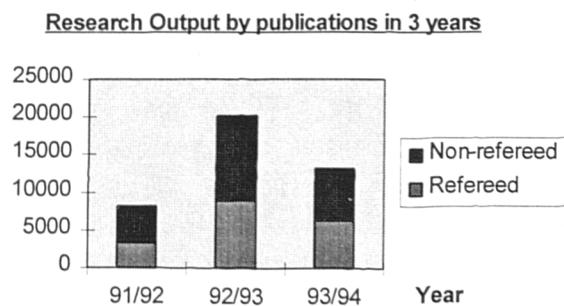
1991-92 (\$ million)	1992-93 (\$ million)	1993-94 (\$ million)
183	260	373

Source: UGC & CityU, 1995



Research output: It is not easy to find an objective measure of academic research output other than publications. The following table summarizes the publications for 91/92 to 93/94:(UGC, CityU, 1995)

	Refereed	Non-refereed	Total
1991/92	3298	4888	8186
1992/93	8,968	11,153	20,121
1993/94	6,224	6,917	13,141



Source: UGC & CityU, 1995

Number of Research Students: number of research students is another good indicator to show the university's commitment in research. The figure has been increasing significantly in recent years from 1,953 in 92/93 to 2,437 in 93/94. The number for 94/95 is not yet available. However, it is estimated with the substantial increase in the number and amount of studentships in 94/95, which is comparable with the starting salary of a fresh graduate in industries, the number of research students will be increased significantly. Another phenomenon is the number of research staff/students coming from China which has increased rapidly. Many departments in the universities have a large number of research assistants, research students and research fellows coming from mainland China. The actual figure is not easy to obtain. But just for reference, one Engineering Department currently has more than 50% of its total research and academic staff coming from mainland China. This percentage was about 10% 3 to 4 years ago. The trend for this increase will be much faster in the next few years.(UGC, CityU, 1995)

Approaching 1997, China will become an important talent source for Hong Kong's technological development. Hong Kong manufacturers should finance and commercialize the Chinese technological research results, and make use of China's strong research and development base to develop the high technology manufacturing in Hong Kong.

III.2.4 Technology Transfer to Hong Kong

Overseas investment plays an important role in Hong Kong's industrial development. It often results in the introduction of new products and the transfer of new production technologies or skills to local manufacturing industries. Factories under overseas management also serve as training grounds for engineers and technicians. The Industry

Department's 1993 Survey of Overseas Investment in Hong Kong's Manufacturing Industries identified 472 companies either wholly or partly owned by overseas interests at the end of 1992.(Industry Department, 1993) These companies employed 72,148 workers, or 12.6% of total industrial employment. The total value of overseas investment at original cost amounted to \$37,279 million. Japan was the largest source country, with a share of 33.4% of total investment at original cost. The United States came second with a share of 27.1%, followed by China (11.1%), the United Kingdom (4.9%) and Netherlands (4.5%). The electronics, electrical products and textiles and clothing industries were the three leading industries, accounting for 31.4%, 11.1%, and 11% respectively of total overseas investment at original cost. *Many of the overseas investments are from world leaders in their fields and have contributed significantly to upgrading the level of technology and expertise of the local manufacturing sector. In common with problems in technology transfer elsewhere, there are some difficulties due to cultural differences. The general Chinese cultural values will affect what can be taught as they set limits to the transferability of western managerial techniques, practices and processes. Chinese values, including values such as collectivism, high power distance, 'shame', reciprocation and 'face' can be seen to set limits to the transfer and diffusion of managerial techniques, practices and processes.*

III.3. High technology development in China

China's coastal area has experienced rapid development over the past decade and is playing a leading role in China's economy. However, its outdated industry and product structures have affected its further progress in high technology development.

Consequently, appropriate adjustments in technology management and strategy are urgently required. Undoubtedly, these adjustments will face a lot of difficulties. In fact, technology development has gained some momentum in China. For instance, the development of the science and industry park in Shenzhen Special Economic Zone's is a good example. Just one hour by hoverferry from Hong Kong, the Shenzhen SEZ Science and Industry Park encourages foreign investment with preferential tax rates. The rents over there are as low as one-eighth of those in Hong Kong with cheap labor, water, and electricity. Hong Kong companies have expanded their manufacturing operations to China successfully. Hong Kong firms wanting to maintain their competitive standing to produce high-tech products must spend their own money on R&D, and come up with imaginative ways of saving in production. In fact, many component manufacturers, after the successful transfer of their assembly lines to China, have formed joint ventures with their former vendors to develop their own brand names. But very few of them undertake product research and those that do normally cooperate with the multinationals. China offers well-qualified workers, scientist, engineers and managers at salaries much lower than in Hong Kong. Even well-trained engineers from top Chinese Universities in Beijing and Shanghai are looking for jobs at extremely low salary in PRD region. With this vast supply of intellectual talent, there should be high potential for successful high technology and new product development in China.

IV. Current Practices of New Product/High Technology Development in HK/PRD

A survey on the current practices of new product and high technology development in HK/PRD was conducted in early 1995. Following is the summary of the survey findings:

IV.1 Research and Development

The majority of the respondents(75%) have established small R&D departments in their own organizations. Electronic and toy industries had the highest percentage with R&D set up. This finding is different from most of the past studies' results, i.e. Hong Kong manufacturers seldom focused on R&D.(Yam C.M., 1992) Only 15% of the respondents had R&D set up in their China plants. This implies that R&D works are mainly held in Hong Kong. Most of the companies without R&D set up were not interested in establishing one in the near future. They considered 'lack of expertise', 'too much investment' and 'not required by customers' were the major reasons for them not to build up their R&D strengths.

IV.2 Product Design

The majority of the respondents in the toy(75%) industry used their own design or a very small portion of customer's designs for manufacturing their products. All other industries relied heavily on customer's designs(64%). Only 14% of the respondents had all their products designed by themselves(mainly from toy industry). This implies that most Hong Kong manufacturers are still unable to divorce from the "customer's design" operating mode. The situation is illustrated in the following pie charts:

Fig.27 Product Design Functions of HK/PRD Toy Industries, 1995 Survey

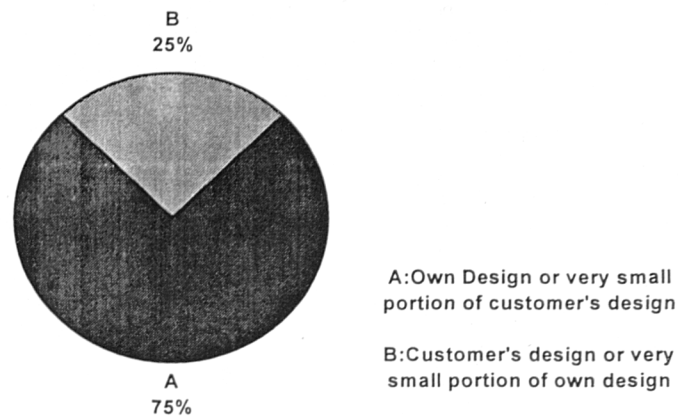
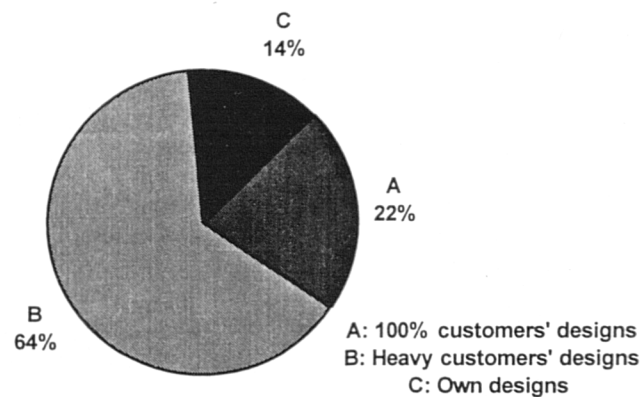


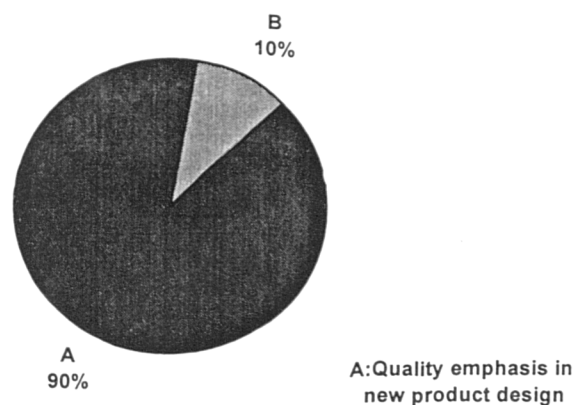
Fig.28: Product Design Functions of HK/PRD Manufacturers(All industries), 1995 Survey



Regarding the future plan of building up own-design function, many respondents(45%) had plans to build up their own-design or de-emphasizing the customer's design approach in the near future. They recognized the importance of fast response to the rapid changes in the global markets. The time available to respond would become shorter and shorter. Most manufacturers are in the right direction but the pace of change is not fast enough.

Companies with in-house product design reported that all their design offices were located in Hong Kong, 30% of them also had design offices in China. This implies that product design functions are basically provided by Hong Kong's operations. The available product design expertise plus the most updated world-wide marketing information in Hong Kong were the major reasons quoted by most respondents why Hong Kong was more appropriate as the design centre. Concerning the quality issue during design, over 90% of the respondents with design functions stressed that quality emphasis in new product development would be important for achieving the right-first-time quality products at the early stage.

Fig. 29 Quality emphasis in new product design, 1995 Survey

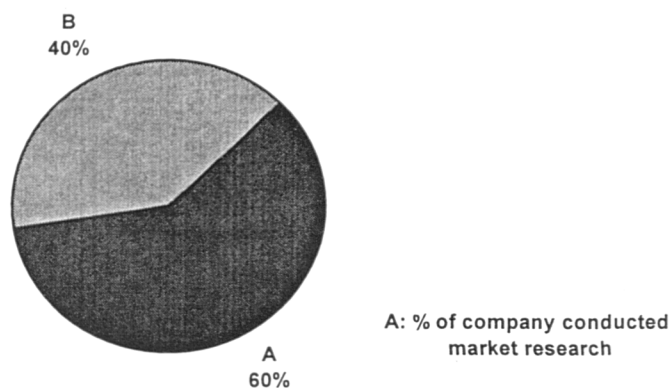


IV.3 Time-To-Market Approach

Nearly 60% of the studied companies conducted market research to collect customers' information. The electronic companies emphasized more on market research due to the very rapidly changing market requirements of the industry. Those companies without

market research were asked whether they would conduct such research in the future, most of them(70%) showed no interest to do so. They were still satisfied with their existing operation mode. Face-to-face contact with customers and investigation of similar products in the market were the most popular means used for collecting market information. Only 10% of the respondents employed marketing research firms. The percentage of the studied companies which conducted market research is shown in the following pie chart:

Fig. 30: Percentage(%) of Company Conducted Market Research, 1995 Survey



The majority of respondents agreed on the competitive advantages of being the first market entrant, fast-to-market was 'quite' to 'very' important to them. Electronic companies appreciated being the first most. Most respondents believed that first market entrance might not necessarily be the best. The appropriate market entry time determined after detailed analysis of consumer behaviour, potential market size, market situation would be even more important.

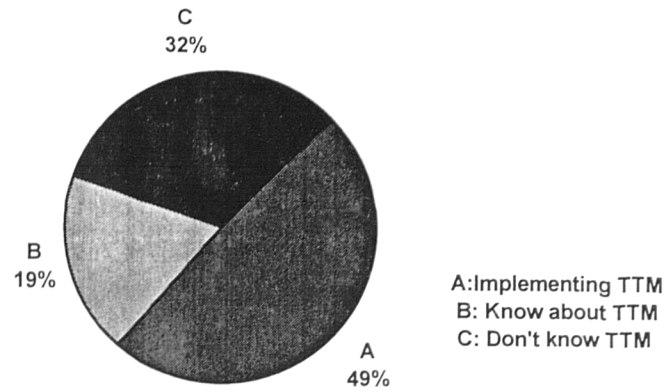


Fig. 31: Acceptance of TTM in New Product Development by HK Manufacturers, 1995 Survey

Fig. 31 shows that almost half of the respondents had adopted TTM. A total of 68% of them realized the TTM concept. This is a significant improvement since the last TTM study in 1992. Concerning the difficulties of reducing TTM, most respondents considered 'lack of coordination among departments and staff' was the major barrier, followed by 'lack of TTM awareness', 'too large investment' and 'lack of team work approach'.

IV.4 Multi-disciplinary Teams

Only one third of the respondents used a multi-disciplinary team approach in new product development. For those who had multi-disciplinary teams, two third of them used the approach for 'reviewing development process periodically'. About one third used it for 'reduce TTM'. Companies without any multi-disciplinary team expressed their difficulties of building up such a team as 'lack of cross-functional culture' in their company. Most companies had more organizational and management problems rather than technical problems in their new product development.

IV.5 High Technology and New Product Development in HK/China

Table 27 summarizes the important findings obtained from the 1995 survey on high technology and new product development in HK/China:

1. Almost no support in technology development from HK government
2. 84% not appreciated intellectual talent from China
3. 95% considered China's major function as 'Production' only
4. 97% reported technology was acquired from HK
5. 90% quoted 'no experienced technological professional' as the most common difficulties in acquisition, management and exploitation of technology in China.

Table 27 : High Technology and New Product Development in HK/China, 1995 Survey

Almost all respondents claimed that they did not get any or adequate support from Hong Kong Government for their high technology development. The situation for Electronics was slightly better in which 50% of them had got some little support. The vast majority of the respondents could only obtain technical information from government. Only one company said that it had received financial support. A few respondents could get technical support from the universities in Hong Kong. Since the Hong Kong Government has improved significantly its research funding for universities, Universities would be a very important talent source in high technology development for industries. The government, the academies and the industries should work together. China would be a very important source for high technology development. However, the majority(84%) of the studied companies had not appreciated such talent in China. Very few respondents obtained technology support and information from China. Most of the respondents ignored this important resource. About 50% of the respondents had long-term investment plan in new products and technology development. The electronic and toy companies were better than others.

The majority of the respondents indicated that they would locate their design offices in both Hong Kong and China. 95% of the studied companies responded that the major function in China was production, only 27% of the respondents claimed that they would conduct R&D in their China Operations. Hong Kong's contributions to HK/PRD manufacturing were quoted as: 'receive orders' followed by 'bridge between buyers and China', 'purchasing', 'quality assurance' and 'R&D centre' etc. 97% reported that technology was acquired from HK. 90% of the respondents quoted that 'no experienced technological professionals' was the most common difficulties in acquisition, management and exploitation of technology in China.

V. CONCLUSION

The survey findings show that many Hong Kong manufacturers have emphasized more on R&D work in developing high quality, technology-based and customer-oriented new products than before but the extent is still far from adequate. Most companies have only a very small R&D set up. Hong Kong is the R&D support centre for China's operations. This situation would not be changed significantly in the near future as most studied companies indicated that they have no plan to expand their R&D works in China. The major difficulties in establishing R&D in HK are 'lack of government support' and 'lack of long-term investment and expertise in R&D'. China's high technology potential have almost totally been ignored by most HK manufacturers. To commercialize the Chinese technological research results through the HK marketing strengths, would be the key success factor for new product development in HK/China. However, the lack of long

term strategies in R&D, the overlooking of China's R&D talent and potential in most HK companies would further delay the technological development process.

Concerning new product design and development, Hong Kong manufacturers do not emphasize much in-house product design. The majority of the product design offices are still located in Hong Kong because of the available expertise and better marketing information. The current R&D and new product development in HK/PRD region are not proactive enough. Many Hong Kong manufacturers regard the first market entrant as important for new product success, but they also consider that it may not necessarily be the most appropriate market entry time. Some companies have adopted a TTM approach in their new product development but TTM is not emphasized in China's operations. Multi-disciplinary project teams are not common in many companies. TTM awareness has been improved significantly, however, many companies are still lacking the appropriate techniques to support TTM implementation. Overall, the major barriers in new product development are organizational and managerial problems rather than technical. Because of the proximity and the good transportation link between HK/PRD, business communication and transportation between plants in Hong Kong and China would not impose a long time lag upon the whole product development and manufacturing cycle. Speed to market would still be maintained through the Hong Kong—China cooperation.

To conclude, quality, technology, time-to-market and price are the competitive edges for HK/China manufacturers. The proactive, quality and time-to-market approaches in new product development are better understood by many HK manufacturers but the commitment to implementation is missing. By exploring China's technological support, which has largely been overlooked by most Hong Kong manufacturers, plus the strong commitment in new product/high technology development with special emphasis on quality/time integrative approach, HK/PRD manufacturers would soon be able to develop more technology-based, high value-added and customer-oriented products which are fast to market with maximum satisfaction.

CHAPTER 6: LOGISTIC SYSTEM BETWEEN HONG KONG/CHINA

I. Hong Kong : A Manufacturing Services/Logistic Support Centre for China

Under the ‘outward processing ‘ contractual export arrangement, most of the goods are made in China from materials supplied by Hong Kong. Over 60% of HK’s imports from China and 80% of HK’s domestic export to China are of this nature (Schofield L. & Boyce DP., 1993). However, this outward processing arrangement between HK/PRD has created a very heavy traffic flow of cargo on the logistic network between PRD/HK.

Year	1989	1990	1991	1992	1993
Total Cargo Movement	84.63	87.4	101.6	116.7	130

Table 28: Cargo movement between Hong Kong & China (1988-1992) (million tones)
Source: Hong Kong Digest of Statistics, 1994

Table 28 shows the rapid growth in cargo traffic between HK/China during 1988/92. According to *Hong Kong Digest of Statistics, 1994*, the total annual tonnage of cargo handled by Hong Kong has increased from about 85 million tones in 1989 to over 130 million tones in 1993. With the Chinese Government's keen commitment to its economic reformation, the cargo traffic between Southern China/Hong Kong and the world will become more extensive.

II. Hong Kong : An Entrepot for China

Hong Kong, with its deep water harbour and emphasis on import/export trade, is one of the busiest ports in the world. Hong Kong is strategically important as an entrepot for China and as a transshipment port for Asian and World trade. Located at the mouth of the Pearl River with excellent container handling facilities, Hong Kong is the best deep seaport for containers on the Southern China coast. According to *Container*

International yearbook, Hong Kong handled a total of nearly 110 million TEU (twenty feet equivalent unit) in 1993 and has become the world's busiest container port. Sea transportation which is estimated to account for 90% of Hong Kong's international cargo movement by weight and over 50% by value plays a vital role in the territory's economy. The extensive increase in re-export trade between Hong Kong and China has shown the territory's importance as an entrepot for China Trade.

Experiences in China trades have shown that it is always risky to ship goods directly to China as the cargo status in China is often hard to trace. Movement of goods through Hong Kong to and from China is always more reliable and safe. That is why many manufacturers and shippers prefer their cargo to go through Hong Kong. Hong Kong's warehouses and cargo handling equipment provide the forwarders and shippers the opportunities and facilities to personally view and inspect the goods before they are packaged for export. Furthermore, freedom of cargo movement, money and information also attract exporters in China to ship goods via Hong Kong. (Trunick P.A., 1993)

China has a huge port development plan in the Southern Coast. However, competing ports in Shenzhen immediately north of Hong Kong and elsewhere in the Southern China coast do not have the depth of water and the rail/road support system that Hong Kong can offer. These fast developing ports will be complementary to serve the rapidly developing region rather than being in competition with Hong Kong.(China Business Review, 1993, Westlake M., 1991)

III. Inadequacies of China Transportation System

The development of current transportation systems and logistic support in China has fallen well behind the pace of the rocketing economic development in the country. Demand for moving goods and people has accelerated far beyond the capacity of its outdated transport facilities. The rail network is under capacity and its development is stagnating. Rail freight capacity increased only 0.7% during the first half of 1993 in which the China's gross industrial output surged by 25%. During the first decade of the economic reforms, i.e. from 1981 to 1990, state investment in transportation was just 1.4% of GNP, roughly half that of other developing countries. Conservative estimates put the annual cost in loss of production from the shortcomings of railway alone at tens of billions of renminbi(Yen), some put the figure in the hundreds of billions (*Business Asia*, 1994). Table 29 summarizes the length of transportation routes of different transport modes in China (*China Statistical Yearbook*, 1994). Table 29a shows the growth index of the increase in the length of transport routes. The two tables show a very slow growth rate in China's transport development and reflect how Chinese government put more efforts in the development of roads and civil aviation routes instead of railway tracks and inland waterways.

	Year							
	1979	1981	1983	1985	1987	1989	1991	1993
Roads	875.8	897.5	915.1	942.4	982.2	1014	1041	1083
Railway	49.8	50.2	51.6	52.1	52.5	53.2	53.4	53.8
Inland Water	107.8	108.7	108.9	109.1	109.8	109	109.7	109.7
Civil aviation	106	218.2	229.1	277.2	389.1	471.9	559.1	960.8

Table 29: Length of Transport Routes of Different Transport Modes in China(1,000 km)
Source: China Statistical Yearbook, 1994

	Year							
	1979	1981	1983	1985	1987	1989	1991	1993
Roads	100	102.5	104.5	107.6	112.2	115.8	118.9	123.7
Railway	100	100.8	103.6	104.6	105.4	106.8	107.2	108
Inland Water	100	102.6	102.7	102.9	103.6	102.8	103.5	103.4
Civil aviation	100	205.9	216	261.5	367	445.2	527.5	906.4

Table 29a: The Growth Index of the Length of Transport Routes in China
(Length in 1979=100)

Source: China Statistical Yearbook, 1994

Many problems in domestic distribution are due to the China's regional self-sufficiency economic policy. Until 1980s, factories produced according to assigned quotas to local markets with local supplies. As a result, few transportation or distribution channels exist to move products between regions and provinces. Therefore, manufacturing for export in China has been concentrated within 100 Km of the coast. However with factories steadily migrating further Inland, Chinese exporters are facing mounting transport bills and unacceptably long cargo delivery time. Moving goods in China has become more and more difficult.

Transporting Cargo in China heavily relies on rail. The road system, except that in the Pearl River Delta, is too primitive, poor quality and far from satisfactory for heavy cargo transportation. Even so the spread of the railway network in China is very thin comparing it with western countries. Following is the railway length ratio comparison between China and U.K.:

	RAILWAY (Km)	
	CHINA	UK
Area : (per 10,000 Km ²)	55.8 Km	679 Km

(Source: *Distribution*, 1994)

The rail network has become the bottle neck in the nation's economic growth. A recent survey result outlined below shows that rail times for cargo between Shanghai and other major cities in China are unacceptably long :

FROM	SHANGHAI	
	DAYS	RAIL(Km)
Guangzhou	25	1,945
Beijing	21	1,462
Xian	45	1,511

(Source: *Transport*, 1993)

In addition, the rail system does not cope with emergencies. Freight reservations, in terms of months, are always required in almost all situations. In 1993, there was only a 3% increase in rail transport which could hardly match the 12.8% growth in GNP and 23% rise in industrial production. In order to rectify the situation and to cope with the fast expanding economies, China is undertaking a huge railway development plan. The total length of China's rail lines will reach 60,000 Km in 1995. By the turn of the century, the rail network is expected to encompass 70,000 Km and to exceed 90,000 Km by 2010. The country's eighth five-year economic plan has been modified to add 10,000 Km more rail projects to reach the following goal: completion of 6,600 Km of new lines; double-tracking of 4,100 Km and electrification of 5,400 Km of existing lines. The construction of the Beijing Kowloon (HK) line - the largest project in the country's railway history with an estimated cost of \$5 billions - was completed in late 1995. With a total length of 2,370 Kms, it becomes one of the country's major rail corridors running North and South through seven provinces. The length of roads increased 18% in the last decade. Because of its high flexibility the road system is being used to handle low-volume, light-weight cargo. A highway linking HK and Guangzhou was opened at the end of 1994, and traffic congestion between HK/PRD region has been much improved.

Only 20% of the country's 1.08 million kilometers of roads are paved and just 650 kilometers are expressway. (*Transportation*, 1994)

Air freight is little better. A three to four days wait is not unusual and Shanghai-Guangzhou Cargo rarely arrives in less than five to six days. In emergencies, companies are increasingly opting to send an employee with urgent cargo as passenger baggage. The airport in PRD is Shenzhen International Airport but it has failed to establish international routes. Basically, most of the airports in China are still suffering from routing problems, poor ground services, long cargo shipment schedules with poor cargo handling facilities, management processes non-conforming with international practice, insufficient transport infrastructure linking the airport to the nearby industrial areas etc.

The cargo movements through most of China's seaports in 1993 could keep in pace with the growth in foreign trade, however, backlogs and delays were still commonly encountered in many ports. Many port operations remain inadequate, inefficient and sometimes corrupt. Goods could very often be tied up in docks for days or sometimes even weeks. Container handling capacity is still small as a percentage of total shipping freight volume. In 1993, around 1.3 million 20-foot equivalent units (TEUs) were handled. It was very small compared with HK's 110 million TEUs in the same year.

IV. Traffic between Hong Kong and Pearl River Delta

Different from the other parts of the country, road transport is currently the major mode of transport for moving the stepped-up flow of goods between HK/PRD. Cross-border road freight traffic surpassed rail volume a decade ago and now exceeds 12 million tons annually. Before the opening of the Guangzhou-HK express highway and the 24-hour border crossing since November, 1994, there were enormous complaints about road congestion in the PRD. Blockages were reported coming out of Guangzhou, at the China

- Shenzhen border and at the Shenzhen/Hong Kong border. The normal 2-hour trip between Guangzhou to Shenzhen took about three to five hours. The situation has been significantly improved. Table 30 shows the cargo movement by different transport modes in HK in the years 1988-1993:

Trans- port mode (million tones)	Year	1988	1989	1990	1991	1992	1993
	Ocean	61.3	64.7	66	76.5	84.2	96.1
	River	10.1	9	9.3	11.1	17.4	N.A.
	Rail ϕ	2.2	2.2	2.2	2.1	1.9	1.6
	Road	6.7	8	9.1	11	12.2	13
	Air	0.7	0.73	0.8	0.85	0.96	1.14
	Total	81	84.63	87.4	101.55	116.66	111.84

Table 30: Cargo Movement by Different Transport Modes in HK

ϕ : Livestock excluded (Source: Hong Kong Government, Annual Reports)

The joint venture status of the transportation company is necessary to secure the important double license permitting trucks to pick up goods in Guangdong and return to Hong Kong without costly and time-consuming cargo switches at the Shenzhen-HK border. To relieve congestion both on the roads and at the customer clearance between Shenzhen and Hong Kong, some companies are shifting some cargo to river barges for loading and discharging cargoes in a number of feeder stations along the Pearl River. Small feeder vessels bring common cargo, such as agricultural commodities, food or bulk items on rivers between HK/PRD. The Chinese ports do not have the depth of water or the volume of cargo to attract large vessels. The midstream operation in Hong Kong harbour provides another alternative for container loading and discharging to relieve congestion in container terminals. It handles about 30% of Hong Kong's total container throughput. However, as the prime site for midstream buoys is restricted, its operation is expected to be saturated in 1996. Mid-stream provides a level of flexibility and

competition. It also handles much of the downstream barge traffic from Guangdong. (*Far East Economic Review*, 1991)

V. Logistic Practices in HK/PRD Region

A survey was conducted in 1995 to find out the current logistic practices in HK/PRD:

V.1 Survey Findings

The industry profile of respondents closely matches with the findings of the FHKI survey in 1993(FHKI, 1993). 72.4% respondents reported that they have production plants in China. Over 95% respondents reported that their plants are located in PRD. Shenzhen(49%), Dongguan(19.5%) and Guangzhou(7.4%) are the most popular areas for HK Manufacturers. This finding is consistent with the FHKI survey in 1993.

Modes of Cargo shipped between HK/China

The survey findings show that there is rapidly growing demand in cargo traffic between HK/PRD under the 'outward processing arrangement'. Table 31 shows the Types of cargo shipped between HK/China from the survey analysis:

Direction	Item	%
Into China	Raw material	72.3
	semi-finished	25.6
	Finished product	2.1
Out of China	Raw material	0
	semi-finished	28.6
	Finished product	71.4

Table 31: Types of Cargo(%) Shipped between HK/China, 1995 Survey

Almost all items transported from Hong Kong to China are raw material and semi-finished products for outward processing. The semi-finished and finished products are shipped back to Hong Kong for further processing such as packaging, testing or inspection before re-exporting to other countries. This further strengthens the role of

Hong Kong as logistic support centre for the PRD region.

Transport Routes for China's Exports

Over 95% of the respondents transported their products manufactured in China through Hong Kong either as the final destination or as an entrepot to overseas countries.

Transport mode	Transport route	
	(China↔HK)↔Overseas, China↔HK	China↔Overseas
Road	83.0%	N.A.
Sea	5.8%	4.4%
River	2.8%	N.A.
Air	1.6%	0.4%
Rail	2.0%	N.A.

Table 32: Transport Routes for China's Export via Hong Kong, 1995 Survey

<u>Notation</u>	<u>Explanation</u>
1. (China↔HK)↔Overseas	China to Overseas & vice versa with Hong Kong as an entrepot.
2. China↔HK	China to Hong Kong & vice versa.
3. China↔Overseas	China to Overseas & vice versa.

Road transport is dominant over the other transport modes in traffic between HK/PRD.

83% respondents used road transport to export their products from China via Hong Kong because of its flexibility in cargo handling, time scheduling, adaptability and promptness in medium and short-haul traffic to achieve door-to-door delivery. The road transport route via Hong Kong was considered as good and reliable with adequate and efficient facilities by most respondents. Cargo damage and loss warranty rates are acceptable. However, there are problems in traffic congestion, blockage at border crossings and corruption. With the opening of Guangzhou-Shenzhen Expressway and the 24 hours vehicle border crossing at Lok Ma Chau at the end of 1994 the situation has been significantly improved. The order of preference of different transport modes ranked by

the respondents were road, sea, river, railway and air. The position of rail was overtaken by road a decade ago. It now shares a very small portion in the total cargo shipment between HK and China. Air cargo is insignificant. The majority of respondents *replied* that the existing transportation systems in China have difficulties to cope with the rapid expansion of their operations. Also, over 65% respondents reported that their companies' operations are heavily relying on the logistic and transportation development in China. Some consolidated suggestions from the survey for improving the transportation system between HK/PRD are summarized as follows:

1. Highway with the advantages of promptness and heavy transport should be developed as the main means of medium and short haul transport to achieve door-to-door delivery in HK/PRD.
2. Rail should still remain as the backbone of China's comprehensive transport system for linking up other modes of transport into an organic whole. The development of the rail should focus on long haul bulky cargo traffic and high speed passenger traffic. Also, the conversion to double tracks, and phasing out of internal combustion by electric engines should be expedited.
3. Sea transport should be developed to carry long haul bulky containerized cargo, the port facilities and the back-up services of the existing seaports should be upgraded and more seaports are required.
4. Inland river transport is preferable for long haul bulky non-containerized cargo traffic, the routes of the rivers and the inland river ports should be improved to accommodate larger ocean vessels.
5. Civil aviation should focus on international exchange and long distance travel over the other modes of transport. Existing supporting facilities should be enhanced and

new facilities constructed. Since there are many airports in PRD from which air routes are heavily overlapped, there is a need to devise a coordinated system to control air traffic, regulate flight time and flying distance in order to minimize potential problems and maximize effectiveness.

V. 2 Future Development

China has embarked on the largest rail-building programme in its history (Business China, 1993). Some 6,600 kms of new lines will be laid by the end of 1995, bringing route kilometres to 60,000. The next 5-year rail-plan envisages an addition of a further 10,000 kms. Before the year 2000, major roads construction projects will be concentrated on the development of the 'three-vertical(north to south) and two-horizontal(east to west) lines' and the two major side highway routes development to cover most major cities in the countries.

In Pearl River Delta region, ambitious networks of rail, road and port projects are on the books to cope with the rapid expansion. Since the late 1980's, 1,700 km roads have been completed of which 370 km are expressways. The \$800 million Guongzhou/Shenzhen/Zhuhai Super highway is a prime example of foreign direct investment. The Hong Kong based Hopewell Company and the provincial expressway corporation will jointly build and operate the road. The 123 km Guongzhou/Shenzhen section was completed by end of 1994. There will be five new international airports, i.e. Shenzhen, Macau, Zhuhai, Guangzhou and Chek Lap Kok(HK), to be completed within next two to three years in the HK/PRD region. Many major port development projects are underway in Guangzhou, Shenzhen, Gaolan, Zhuhai of PRD and Hong Kong. With the completion of all these projects, the traffic in the HK/PRD region will be significantly enhanced (China Business Centre, 1995). In the next 20 years, Guangdong province plans to build 16

expressways with a combined length of 3,300 km and a total investment estimated at \$15 billion. Upon the completion of the massive multi-billions HK\$ Port and Airport project in 1997/98, the strategic position of HK, as the manufacturing services and logistic support centre for Southern China, will be further strengthened.

However, all these major development plans are focused mainly on the improvement of the transportation systems within and between HK/PRD, or between PRD and the other major cities in China and PRD. The linkages between PRD and other inland provinces are largely neglected. The survey and the subsequent interview findings show that most Hong Kong Manufacturers in the major cities of PRD, even though are facing ever increasing wages and other operating costs in recent years, do not have plans to move beyond PRD region to the inland provinces. This is because of the inadequate logistic system support and poor infrastructure development in other regions. Every year there are millions of peasants flowing from inner provinces to PRD looking for jobs. Supply of cheap labour is plentiful. Shifting to inner province for cheaper labour is not justified. However, some Hong Kong manufacturers do have plans to expand or transfer their plants beyond the three major cities in PRD, i.e. ShenZhen, Dongguan and Guangzhou, to other newly developed PRD areas where the logistic support has been improved.

Chapter 7: FUTURE DEVELOPMENT AND CONCLUSIONS

I. Future Development Model

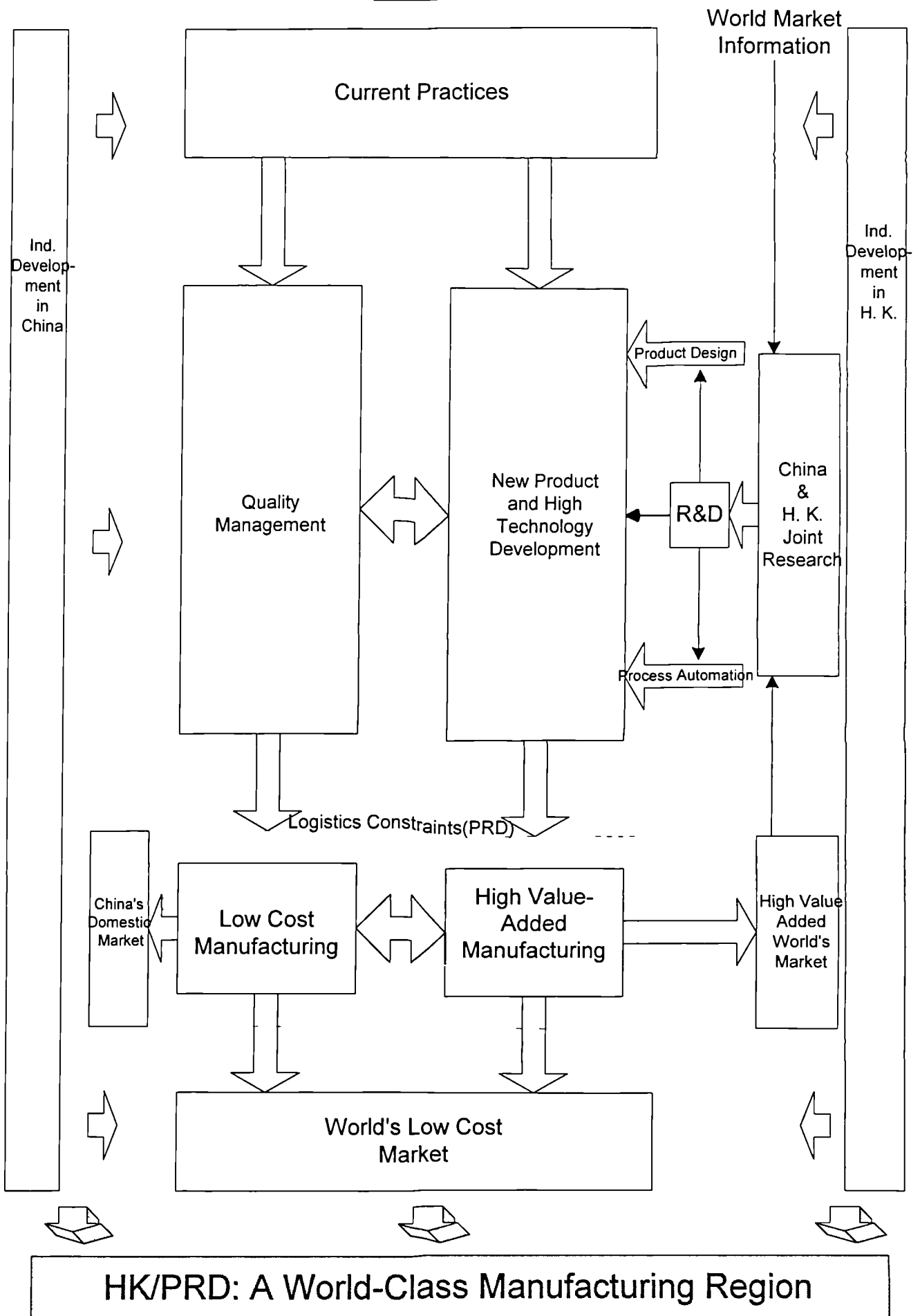
From the consolidated results of the literature review, questionnaire surveys and structured interviews, an initial model was derived from the hypothetical model(Fig. 1). This tentative model was then verified by discussion with HK/PRD manufacturers and academics in the field. After lengthy discussion and many iterations, the future development model was derived. This model, as shown in Fig. 32, focuses more on the future development of HK/China manufacturing industries than the hypothetical model in Fig. 1. The possible scenarios of the model are described in section III of this chapter as well as in Fig. 36 & 39. Details of the model are described as follows:

I.1 Current Situation of HK/PRD Manufacturing Industries:

I.1.1 Low cost manufacturing: The findings in the previous chapters indicate that the overall HK/PRD manufacturing industries are operating very satisfactorily in the PRD region. China's cheap land and labour costs are really providing many cost advantages for HK/PRD manufacturers to maintain their price competitiveness in the world market. Most manufacturers seem to be satisfied with the status quo.

I.1.2 Quality Management Practices: Quality emphasis in HK has been improved significantly in recent years mainly because of the ISO9000 movement. Most manufacturers understand that it would be difficult to compete in overseas markets without ISO9000 certification. Because of this certification process, manufacturers understand quality philosophy, concepts and practices much better than before. Many of them believe in quality and commit to implement quality management systems for improving their competitiveness. CQI(continuous quality improvement) has been widely adopted in many

**Fig.32: Future Development Model
for HK/PRD Manufacturing
Industries**



companies as a quality strategy beyond ISO9000 for working towards TQM as their long term quality goal. Quality aspects in China are mainly directly transplanted from Hong Kong. Since HK manufacturers have improved in quality emphasis at about the same time that they started to transfer their low-cost activities to China, quality management know how and experiences were also transferred to China. Therefore, most China operations have adopted quality concepts and practices right at the beginning or at their infant stage of development. Even though quality emphasis in China is rather reactive than proactive, the problem is 'they don't know how to do it' rather than 'they don't want to do it'. Therefore, resistance to change is very minimal in China. HK/PRD manufacturers have built up a reasonable foundation for pursuing quality.

I.1.3 Product Design and High Technology Development:

Even though HK/PRD manufacturers have emphasized more on R&D, the extent is still quite inadequate for developing high quality, technology-based and customer-oriented new products. The HK government has increased its support substantially to high technology development, yet its major focus is basically to support university research. Universities in HK are very active in recruiting China's R&D talents to conduct research in HK. However, this high technology potential has seldom been explored by the HK/PRD manufacturers. Manufacturers seem to be very satisfied with their existing low cost manufacturing in China. They hesitate to invest extensively in long term research and development projects. In-house product design is still very primitive in HK. The product design function is mainly supported by the HK office for its available expertise and marketing information. The HK/PRD manufacturers cannot divorce from 'customer's design' mentality.

I.1.4 Logistic and Transportation Support Systems

The logistic and transport systems within the PRD region have been improved significantly and there are massive development projects to be completed in the coming years. However, the transportation links beyond the PRD region to the inland provinces are still underdeveloped. Chances for HK manufacturers to expand to the adjacent provinces beyond PRD would not be high. Instead, the peasant workers flow extensively from inner provinces to the PRD region looking for jobs. The infrastructure development in the inner province is also well behind PRD to attract HK investors.

I.2 Future Development

I.2.1 Quality Management

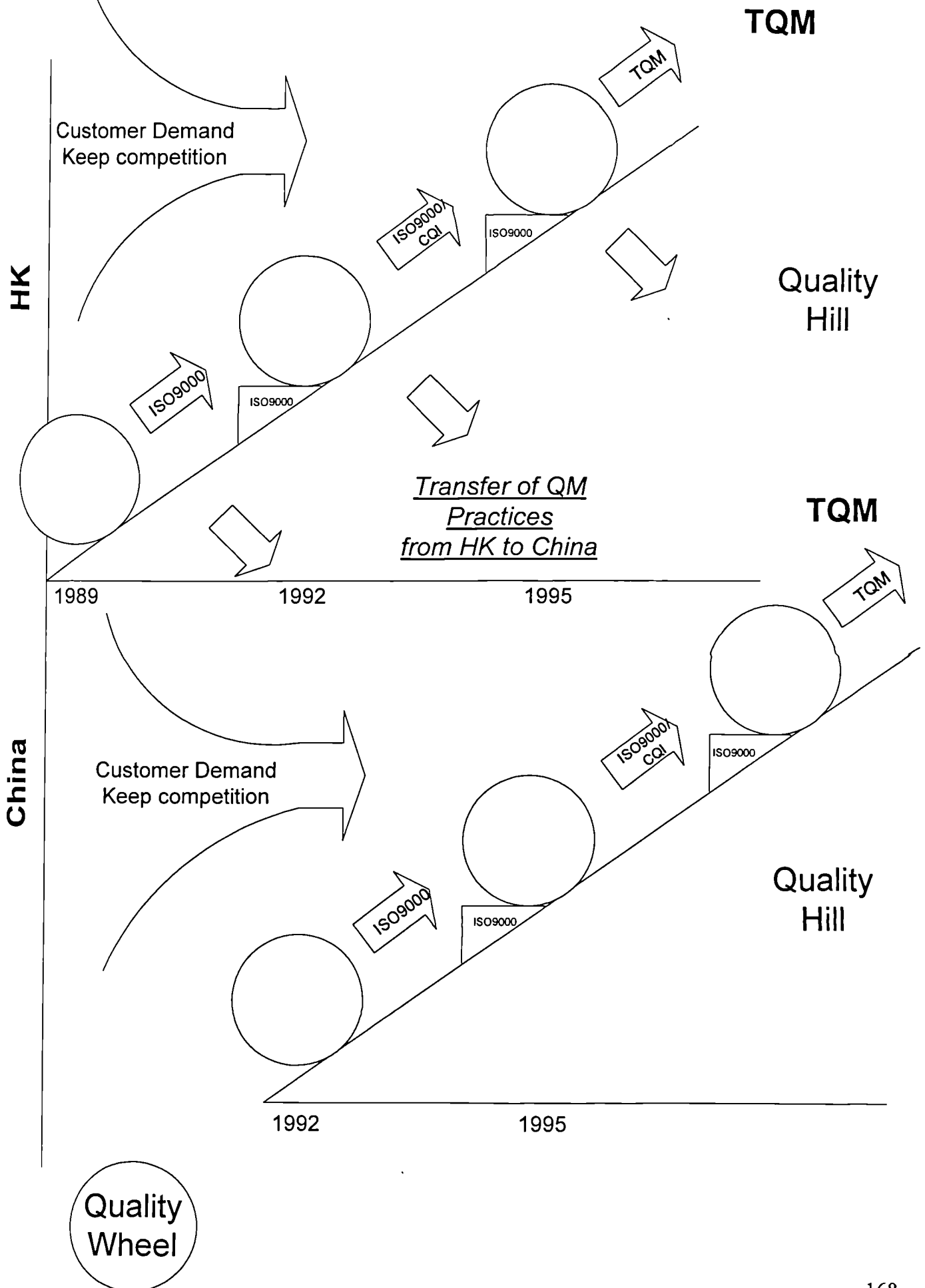
With the successful implementation of quality management in the last few years, many HK manufacturers have already benefited from their efforts in quality. The quality movement in HK/PRD is likely to be continuous as many of them have implemented their quality strategy beyond ISO9000 successfully via CQI or other means. The lack of proactive approach in quality improvement in China operations should be rectified. Hong Kong manufacturers should not only 'transfer' but also help their China partners to 'diffuse' quality concepts and practices into their operations. China must build up their own quality capability and seek for continuous improvement by themselves. Since China's problem is 'they don't know how to do it', training will be most effective to diffuse quality to China. On top of the current practices of providing mainly technical training at operator level, more training on the managerial and behaviour issues should be introduced to build in the right attitude of quality to everyone in the Organization. The role of HK is to provide this type of training to train up the Chinese managers as trainers. The trainers will then multiply the effects via a series of appropriate training programmes to other levels of

employees according to the actual situation of individual organizations. The HK quality experiences of 'ISO9000 to ISO9000-CQI and eventually to TQM' could be a good example to introduce quality to China. Fig. 33 summarizes the HK/China quality movement from 1989 to 1995. Many HK/PRD manufacturers are working in this direction.

1.2.2 New Product and High Technology Development

For product and process R&D, the situation is much more complicated. Theoretically, without new product and process innovation, manufacturers will eventually be kicked out in this more and more competitive market. The problem is how soon? At the present moment, the HK/PRD manufacturers are very successful in their low cost manufacturing in the world market. Keen competition may come from other developing countries, but PRD has a plentiful supply of cheap labour migrating from the rural inland provinces. Even though inflation in PRD has been maintained at a very high level in the last few years, labour wages have been maintained at low level because of the very low initial base rate. Land cost is also maintained at a reasonable rate as China needs low cost manufacturing to provide more jobs for its huge population and to earn more foreign exchange. The low cost advantages and price competitiveness of HK/PRD manufacturing are likely to be maintained for a considerable period of time in the future. In addition, with the opening of the huge domestic market in China, it is likely that the low cost manufacturing market for HK/PRD manufacturers will be expanded substantially. So, what are the direct motives behind the HK/PRD manufacturers to look for innovative new product and high technology R&D in which they have to invest extensively in an uncertain and risky environment. The survey and interview findings have shown that HK manufacturers are reluctant to go into the high-value added territory because of the limited experience in the field, lack of R&D talent, lack of government support(always an excuse)

Fig.33 Quality Journey for HK/
China Manufacturing Industries



and lack of commitment to make long term investment either because of their usual short sighted mentality or lack of confidence in the political situation etc. Two possible motives may lead the HK/PRD manufacturers to step into the high technology territory:

1. Support from Chinese Authority: In recent years, many of the joint venture companies in PRD have benefited and local government have retained large portions of their profits for further development. They can either expand or upgrade their existing low cost activities or look for new ventures. Because of the closed economy in the last 30-40 years, China is very much behind the others in technology development. Chinese authorities understand this situation very well, and are very much encouraging high technology based industries to be developed as an important source of technology transfer so that they can build up their own technology know-how. The retained profits of many successful Chinese JV companies will probably be a very important source of finance to develop high technology industries. Chinese government provides a lot of preferential treatments for technology based companies to be set up in China. JV firms are encouraged to establish their technology through their existing link with China.

2. Support from HK: After relocating almost all the low cost manufacturing activities to China, what should HK do? HK has become the manufacturing and logistic support centre for HK/PRD. The survey findings also show that HK supports almost all the product design functions of its counterparts in PRD. R&D setups are almost all located in Hong Kong. It seems that, at present, HK plays a very important role of design and R&D support functions for China operations in PRD. Manufacturing is shrinking in HK. Because of the extensive relocation of manufacturing activities to China, unemployment at worker and supervisory level in Hong Kong have become serious. Many of the middle age operators from manufacturing industries cannot find jobs in other sectors. The number of A-level

students applying for university degree places in manufacturing has been drastically reduced in recent years. What the HK manufacturers must do is to keep their small high caliber team of design and R&D people in HK as a bridge with the outside world. Conducting market researches to identify the ever and rapidly changing customer requirements would be the important contribution from Hong Kong. This marketing information would be converted as quickly as possible to new product concepts and ideas for further conversion into feasible and manufacturable products through TTM product design management. HK is most competent to perform this role because of its available design expertise with adequate commercial knowledge and fast marketing information.

1.2.3 R&D Supports for Product Design and Process Automation

R&D setup would be extremely important to support new product design and process automation. From the survey findings, the R&D setup in HK/PRD manufacturers are very primitive. The corporate strategies of most HK/PRD manufacturers do not place much emphasis on R&D functions to support innovative product design and process automation. The “manufacture to customer’s design” mentality is still strongly bonded in most manufacturers’ minds. However, there is a great potential for R&D strengths to be developed in the region. A lot of basic research work is going on in most of the universities and research centres in China. Many of these basic research projects are far from being developed as commercial products. But the ideas are there which can form a good foundation for applied research. A lot of these intellectual talents are available in China but have not yet been explored. HK manufacturers can easily recruit graduates, researchers or even professors from famous universities in China to work for them at very low wages. With the extensive development in the postgraduate research work in the universities in HK, a large group of HK young research graduates will soon be available. This HK R&D

team , which are usually more broad and application oriented with good business and marketing knowledge, can work together with the Chinese researchers under the strong entrepreneurship of HK manufacturers to commercialize China's basic research findings. However, from the survey findings, this cooperative R&D effort between HK and China has not been adopted and in many cases it has been ignored.

I.3 Future Development Strategies

The strategic choices for HK manufacturers in improving product and process competitiveness include:

1. Maintain low-cost manufacturing by improved productivity and quality.
2. Acquire new skills to provide new features and services for higher value products.
3. Step into the high value-added, short product life cycle and rapidly changing customers demand territory to become the market leader.
4. A mixture of the above or others.

There is no intention to suggest strategies for individuals as companies are different. However, based on the current research findings it would be worthwhile to analyze different scenarios for HK/PRD industrial development and provide references for HK/PRD manufacturers to make their own decisions.

I.3.1 Low-cost manufacturing: With the 40 years experiences in low cost manufacturing and well established low-cost world market connection, HK manufacturers will not give up this approach easily. This also matches with the current direction and emphasis of China industrial development strategy, i.e. to focus on low cost labour intensive industries via foreign investment to create jobs for its over populated workforce with minimum capital investment. Because of the slow population growth in western countries, the world market for low cost products may be quite sluggish in the future. To couple with this, there is a lot

of competition in low cost territory from other developing countries. HK/PRD manufacturers may not find it easy to expand substantially their share of the world's low cost market. However, there is a high potential that HK/PRD manufacturers can step into China's rapidly expanding domestic market. More than a decade of close cooperation with the Chinese partners provides a very strong business link between HK and China businessmen. Many HK manufacturers have joint venture contracts with the China TVEs(Town and Village Enterprises) in which a certain percentage of their output could be sold in China's domestic markets. This type of domestic sales contract has become more popular when HK/PRD corporations start to reinvest in China through their retained earnings or having the 2nd agreement to develop some new ventures after their first successful collaboration. The low cost manufacturing activities are operating very satisfactorily in China, the prospects of the China domestic market for HK/PRD are good. There is no reason not to continue. As evidenced by the survey findings, many manufacturers will keep their existing mode of operations, however they are planning to improve their operational system via appropriate quality management systems as discussed previously.

I.3.2 High-value added Manufacturing via Product Design and Process Automation

By improving the quality systems of the low-cost approach without product design and process automation, HK/PRD manufacturers can only achieve very small step-by-step improvement in quality and productivity. This improvement is too slow to cater for the rapidly changing market requirements. For maintaining cost competitiveness, HK/PRD manufacturers may be forced to recruit more untrained labour from inland provinces to keep low labour wages. Extensive training is therefore required to maintain quality. It may cost even more just to maintain the 'status quo' of product quality not to mention the

additional costs required for continuous improvement. Therefore, own product design and automated process technology would be essential to provide ‘big-jump’ improvement in quality and productivity even for low-cost manufacturing. HK, in this aspect can take a very active role by its existing marketing and business connections. Instead of waiting for the customer to initiate their new product designs and specifications, HK manufacturers should create their own new product ideas through marketing research. This proactive approach will reduce competition from other “customer’s design” type of manufacturers. This approach requires the back up of a team of intelligent marketing research forces, innovative product designers with good commercial sense and technical knowledge, and upgraded flexible manufacturing technology, systems and personnel to produce a wide variety of timely products. All these require heavy commitment and investment from HK manufacturers. During the structured interview, many manufacturers have pointed out that the ‘one-off’ sudden cost reduction advantages of moving plants to China has gradually been reducing. The transfer of manufacturing activities to China is now for survival rather than improving competitiveness. Overseas buyers are very smart in looking for competitive prices and quality by comparing offers from different HK firms with plants in China. The keen competitors are not coming from other developing countries, they come from HK/PRD manufacturers themselves. The HK/PRD manufacturers are competing with each other. The huge profit margins enjoyed by the early HK/PRD entrants are now reducing gradually. Therefore, on top of cutting costs, HK/PRD manufacturers have to look for other alternatives. New product ideas will create new markets. Appropriate flexible manufacturing processes will facilitate the concurrent engineering approach to reduce time-to-market. It can also improve manufacturability of a wider range of products with higher productivity and better quality. The emphasis on new product design together

with high technology processes will lead HK/PRD manufacturers to step into the territory of high-value added markets which has not been tasted by most of them. In view of the stagnant low cost world market, HK/PRD manufacturers should move fast in this respect.

I.3.3 Market leader and Pioneer in Technology Development

The findings in this project do not support the idea that average HK/PRD manufacturers should step into this territory in the near future. Because of the political uncertainty, the extensive capital investment, the limited technical and managerial know-how, the success in the existing low-cost approach, the “manufacture to customer’s design” mentality and the relatively small to medium size, most of the HK/PRD manufacturers are not equipped to step into this territory in the near future. China encourages high technology development, but its focus is not in Southern China. Most of the heavy or high technology investments in China are handled directly by the central government and the huge multinational firms with setups mainly located in Shanghai-Podong region or other northern provinces (Martinson M.G. & Tseng C.S., 1995, Lincoln K., 1995). Southern China, including PRD, is basically concentrated in light industries. HK/PRD is likely to be developed as the low cost light manufacturing base with gradual migration to high-value added, own product design. This will create new markets and to improve quality and productivity of the existing low cost manufacturing.

I.4 HK/PRD Region: A World Class Manufacturing Centre

I.4.1 The Synergy of HK/PRD Manufacturing Industries

Because of the extensive relocation of low-cost manufacturing activities from Hong Kong to PRD region and the proximity of the two places, the HK/PRD region has been viewed by most HK manufacturers as the same manufacturing entity. The manufacturing activities in both regions are considered as the same operations. The HK/PRD region has an

abundant supply of cheap labour, vast low cost land, strong capital capacity, established business connection and marketing links with the world market, good management practices and reasonable basic technical know how etc. With all these ingredients, the HK/PRD region will have a high potential to become one of the important world class international manufacturing centres.

In terms of capital resources, maturity of managerial and technical know how etc. different companies in the region are at different stages of development to become world-class. Many companies still concentrate on low-cost manufacturing, some may look for higher-value added activities which are more responsive to the ever changing customer's needs and some may be more adventurous to look for market leader position with *innovative* products, time-to-market and automated processing as their competitive edge. Companies can take different approaches, i.e. a step-by-step incremental, a big jump or other approaches, to progress from one stage to another. Many Small to Medium Size firms(SMEs) in Hong Kong, due to their strong low-cost manufacturing *mentality*, are very reluctant to invest extensively in high technology. The incremental approach does not require substantial capital investment and provides the opportunity for firms to gradually pick up the managerial and technical know how. This would be particularly suitable to many of the SMEs in Hong Kong. Entry level automation does not cost much, but provides bridges for companies to step into the high technology territory and gradually be more responsive to the market's demand for high value-added products and services.

I.4.2 Developing HK/PRD to Become A World-Class Manufacturing Centre

There is a high prospect that HK/PRD region would be developed as a world class manufacturing centre with a mixture of low-cost and high value-added manufacturing activities. Companies that find themselves very successful in their low cost activities in

China today may be even more successful by migrating some of their resources and attention to the high value-added activities. The technical and management know how of high-value manufacturing takes time to build up. Focusing solely on low-cost activities may restrict Hong Kong manufacturers operating in the low-cost environment without upgrading themselves. Furthermore, even for low cost products, customers are also looking for quality, variety and speedy delivery etc. If HK/PRD manufacturers do not enhance their capability towards product innovation, process automation and quality management, they will soon encounter difficulties in maintaining their competitive edge. Under the current extremely favourable conditions in HK/PRD region, Hong Kong manufacturers should utilize the excess capital and human resources effectively by stepping gradually into the high value-added manufacturing operations. By following these achievable incremental development strategies, the HK/PRD region will have potential to develop as a world class manufacturing zone facing the global challenges of the 2000s.

II. Analysis of the Future Development Model

II.1 The General Industrial Development Pattern

By analysing the industrial development processes of different industrial countries(World Bank, 1980) , it is noted that, most follow a similar pattern of starting from agricultural and natural resources industries, followed by light manufacturing, high value-added manufacturing and servicing. Fig. 34 shows this general pattern in graphical form.

II.1.1 Stage 1: Agricultural and Natural Resources Industries

Most countries initiated their industrial development by focusing on agricultural and natural resources. Each country has to provide adequate food for its society. Some countries like Japan, because of lack of natural resources, have to rely on light industries to

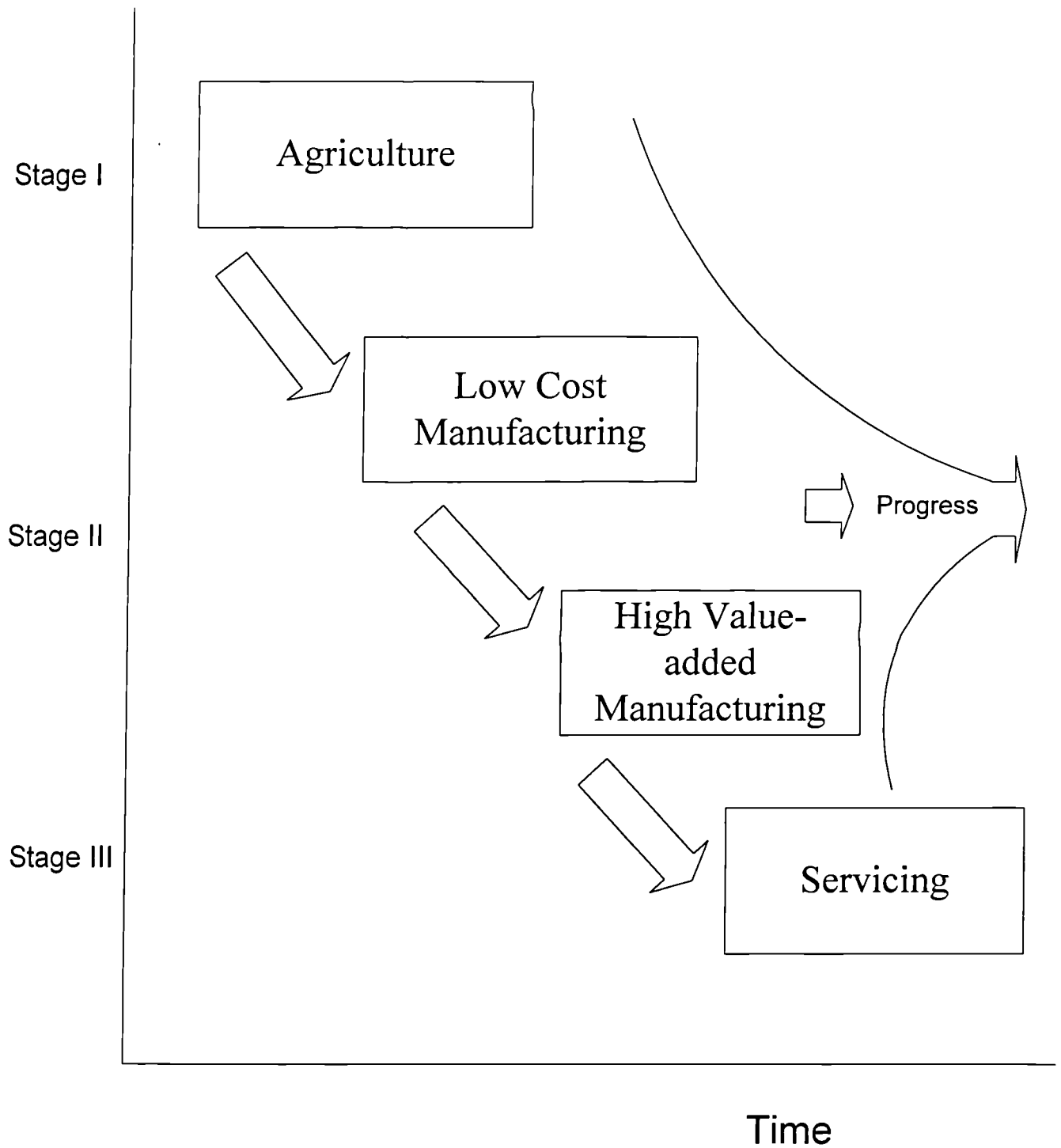


Fig:34 General Industrial Development Model

begin with. China is no exception from this general trend, except that China is two to three decades behind the rest of the world because of the closed economy in the past.

II.1.2 Stage 2: Manufacturing Industries

Emphasis gradually migrates to light manufacturing activities. With the progression and advancement in R&D, focus is shifted to the higher value-added manufacturing activities. Service industries emerge because of the increase in business activities and the increasing demands for better quality of life.

II.1.3 Stage 3: Service Industries

With the highly successful manufacturing development, people tend to place more emphasis on service industries for better and quicker returns in investment and for further improvement in quality of life. Some countries have over emphasized service industries by neglecting the contribution of manufacturing. The Americans suffered a lot by shifting their focus from manufacturing to services in the 1980s and letting the Japanese dominate the world's manufacturing markets. Japan is now also suffering from its shift of focus to finance and property since the late 1980s.

II.2 HK: A Pure Financial and Services Centre ?

From the above, it seems that each country should try to maintain a good balance and mixture of industries in its development process. Agriculture and manufacturing can really produce physical outputs with added value. Service industries can further increase value of agricultural and manufacturing products. However, development of Service industries requires the solid base of agricultural and manufacturing activities. Purely emphasizing services by ignoring others would erode the solid foundation already established. Because of the extensive shift of manufacturing activities from HK to China, many people think that HK should be developed as a predominately financial and services centre with little or

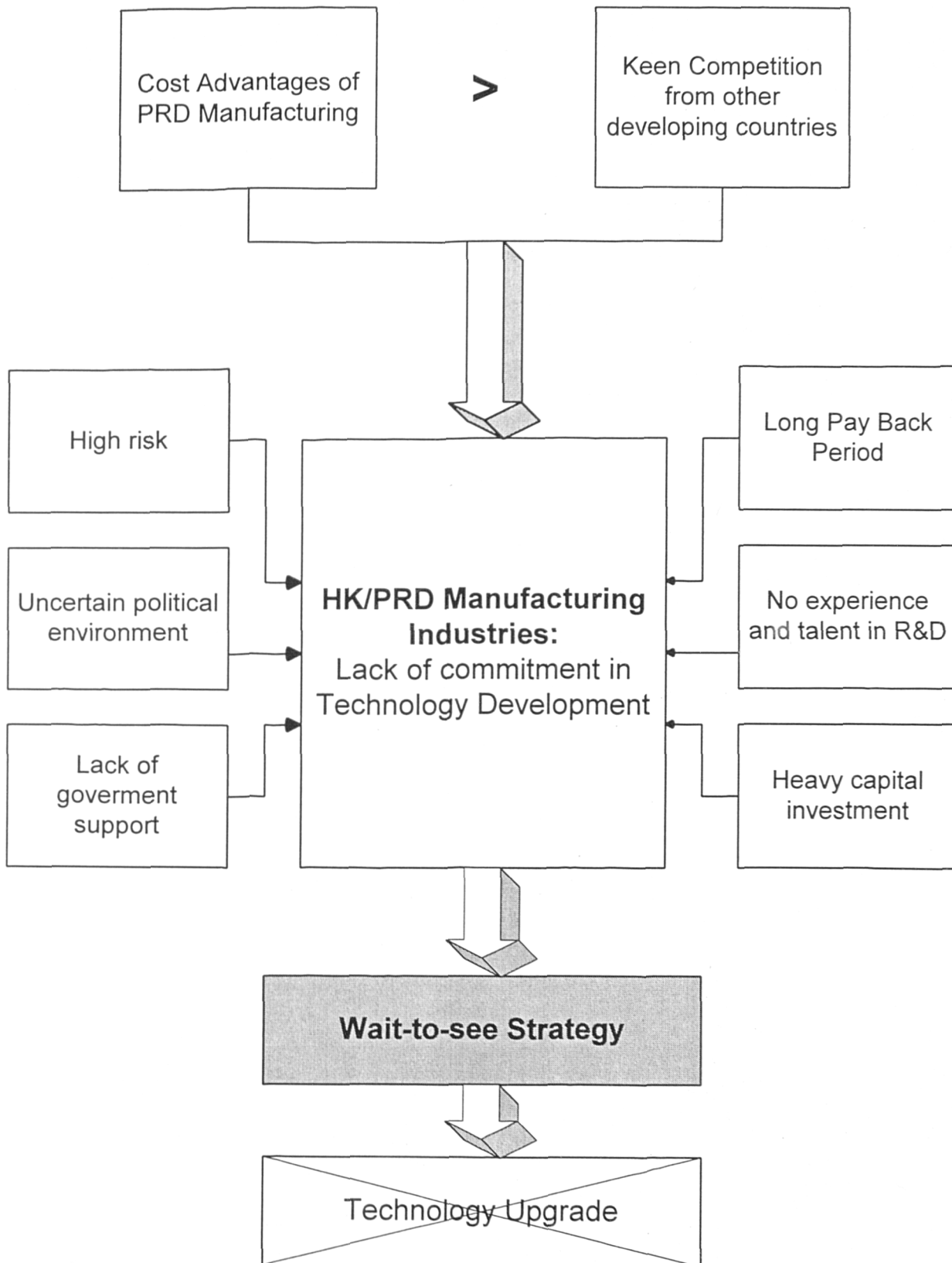
even no manufacturing. The lessons learned from other countries as discussed above do not support this approach. Therefore HK must be careful in this respect.

With the close link and the mutual support between the HK and PRD, shifting manufacturing activities to PRD should be viewed as relocation of manufacturing activities within the HK/PRD region. By looking from this angle, HK manufacturing industries are in fact expanding rather than diminishing. However, the physical manufacturing activities are mostly located in China, so what are the contributions of HK? At the present moment, HK contributes capital, marketing, business connection, low-cost manufacturing, management know-how and logistic links with the world markets i.e. the soft-linkage. These contributions are vital to the success of HK/PRD manufacturing industries. However, China is learning very fast. All these HK contributions can be picked up eventually by China if HK only maintains its status quo without advancement. HK needs to keep on improving its manufacturing capability by merging its commercial and capital strengths with manufacturing. With the current improved R&D support from HK government to local industries, the new R&D blood trained by the universities in HK, the good business connection with customers, the fast and updated marketing information, the strong entrepreneurship of HK businessmen plus the vast supply of R&D talents from China, HK manufacturers should be able to establish their own R&D strengths for stepping into the high value-added product design and process automation territory i.e. the Hard-Linkage . This will continuously improve HK manufacturing and technical competence to contribute to the development of HK/PRD as a world-class manufacturing region towards the 21st century. This will provide a more solid and balanced industrial base for HK than just emphasizing on service industries.

II.3 HK/PRD Manufacturing Industries: Knocking at the Door of High Technology

In the last one and a half decades, China's industrial development has followed a very similar pattern to the general industrial model as shown in fig. 34, i.e. starting from agriculture to light manufacturing. China, or more specifically the HK/PRD region, is now reaching a stage of knocking at the door of the high-value added manufacturing. However, the current project findings have shown that the HK/PRD manufacturers are not ready for stepping into the high value-added manufacturing industries either mentally or technically. Most HK manufacturers still take the wait-to-see strategy as shown in Fig.35 without doing much to upgrade their technical competence. They have been using this wait-to-see strategy for more than 20-30 years. HK manufacturers were very lucky. Low cost manufacturing industries in HK should have diminished in the 1980s by facing keen competition from other developing countries as well as the ever increasing land and labour costs in HK. Fortunately, the low cost manufacturing survived and even prospered because of China's open door policy at about the same time. China's industrial development in the southern part has directly benefited and prolonged the life of the HK low cost manufacturing industries. Most HK manufacturers are hoping for the best again by doing very little to upgrade their technical competence. Customers are becoming more and more demanding in world markets. They are looking for better quality that HK/PRD manufacturers will soon be unable to produce. HK manufacturers are expecting that the China's rapidly expanding domestic market will prolong their life in the low cost territory. However, keen competition will be coming from the local Chinese manufacturers. They are right now at the first stage in the learning process to pick up low cost production through the technology and management know-how transfer from HK. If given the opportunity, they will soon be able to operate as effectively and efficiently as the HK manufacturers. In addition, they will be encouraged and free to explore China's domestic

Fig. 35: Wait-to-see Strategy in High Technology Development in HK/PRD Manufacturing Industries



market without restrictions. But HK manufacturers may still have to face a lot of trade barriers imposed on them. Even China may join the World Trade Organization(WTO, formerly GATT) in the future and China will be forced to open its market for other countries. But it is possible that China would be able to join WTO under the ‘developing country’ status. Most of the basic and light industries may still be under protection for a certain period of time. HK manufacturers cannot and should not rely too heavily on the opening of China’s market. Technology cannot be developed overnight, it takes time to absorb and diffuse. Successful technology transfer takes years to develop. The HK manufacturers short sighted strategy of satisfying the existing situation will soon lead to failure. This time there will not be any open door policy to help HK manufacturers as happened in the 1980s. China can develop its own manufacturing industries without HK.

III. Possible Scenarios of HK/PRD Future Development

III.1 The Most Optimistic Scenario: Fig. 36 shows the most optimistic scenario for HK/China manufacturing industries. This expansion plan is derived on the basis that HK manufacturers will commit seriously to upgrade their product design and process automation by setting up their own R&D activities. Because of the commitment in high technology development, the competitiveness of the low cost manufacturing would also be enhanced with improved quality and productivity. The involvement in low-cost markets could be maintained with new penetration in the high value-added market. With the improved technology and management know how, the chance for expansion in China’s domestic market will also be improved. There are two aspects of development in the most optimistic model i.e. the manufacturing base and the markets for HK/PRD manufacturers:

III.1.1 Manufacturing Base(Fig. 37): With the logistic constraints as mentioned earlier, the manufacturing base for HK/PRD manufacturing industries will probably be

**Fig. 36 Recommended Future Development Strategies for HK/PRD
Manufacturing Industries (Most Optimistic Scenario)**

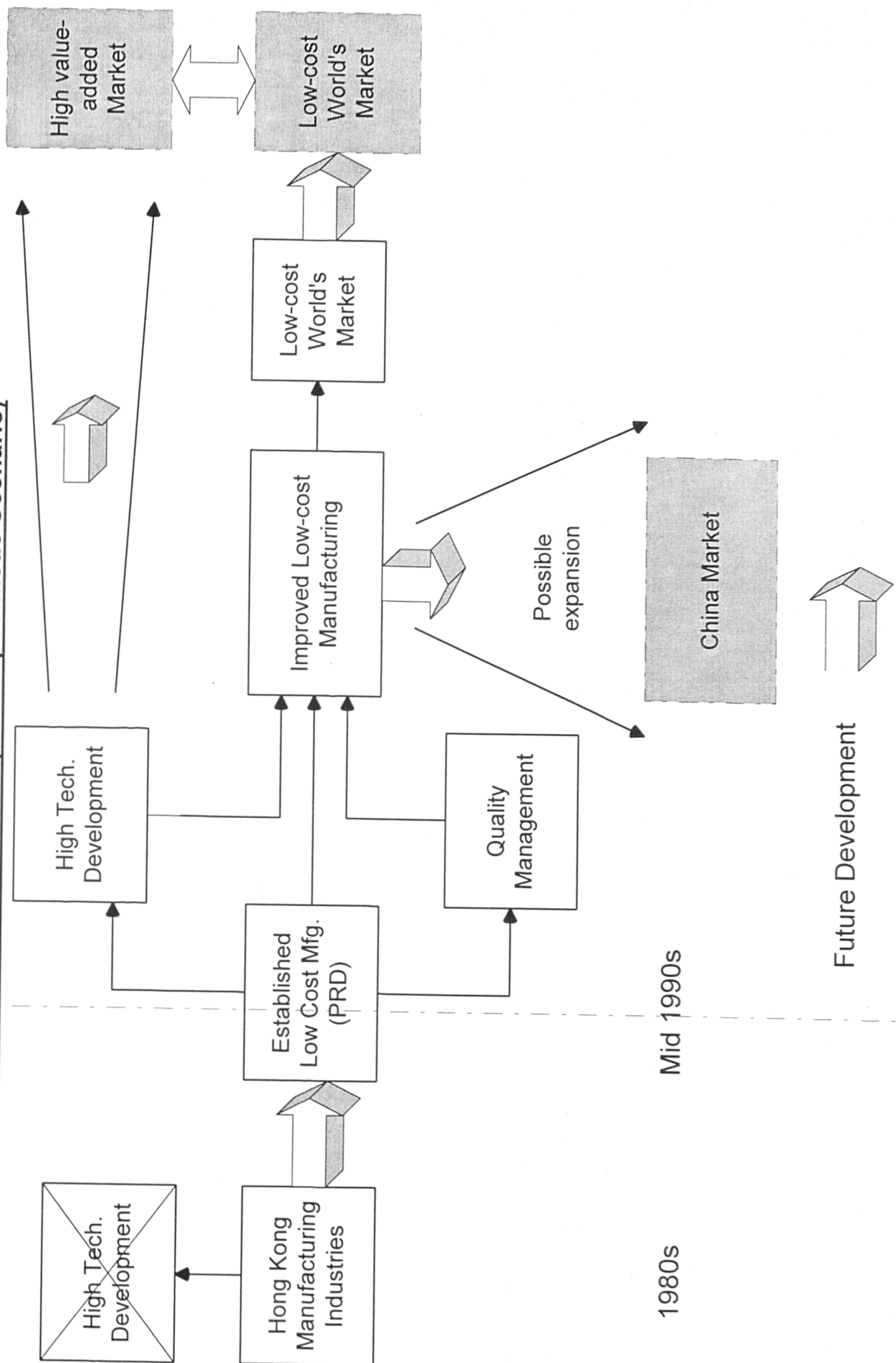


Fig. 37: Future Development of HK/China Manufacturing Industries
(Manufacturing Bases)

	PRD					Inland Provinces	
	Major Cities in PRD		Other Areas of PRD			Low-cost Manufacturing	High Value-added Manufacturing
	Low-cost Manufacturing	High value-added Manufacturing	Low-cost Manufacturing	High Value-added Manufacturing			
ST	High	*Depends on HK Manufacturers' Commitment in Tech. Development Low	Low	×	×	×	×
MT	High → Med.	Med. → Low	Med. → Low	×	*Depends on Logistic Development Low	×	×
LT	Med.	Med.	Med. → High	Low	Low	Low	×

Possible Development

ST:Short Term MT:Medium Term LT:Long Term Development

concentrated in the PRD region. At the present moment, 80% of the HK investment is located in the three major cities within PRD. The manufacturing base for high value added industries will probably be developed in the major cities of PRD with marketing, product design and R&D support functions provided by HK. The low cost manufacturing activities will gradually migrate to those newly developed PRD areas with good infrastructure support. In the longer term, more high end manufacturing will possibly be developed in large cities of PRD with low cost manufacturing shifted to other areas of PRD. Low cost manufacturing will still prosper because of the opening of China's market. Whether the low cost manufacturing can be developed in inland provinces depends very much on the logistic and infrastructure development in those places.

III.1.2 Markets for HK/PRD manufacturers(Fig. 38)

III.1.2.1 World Market: HK/PRD manufacturers can still be able to maintain its share in the world's low cost market in the short to medium term. But in the long term because of the stagnation of the low cost world market, keen competition from other developing countries and the increasing demand for higher quality products from customers, the share of low cost world market for HK/PRD will gradually be reduced. However, assuming good progress in quality and technology of HK/PRD manufacturers, the share of high value-added world market will supplement the decrease in the low cost sector.

III.1.2.2 China Domestic Market: With the technology upgrading, there will be a lot of expansion opportunities in China's low cost domestic market in the medium to long term for HK/PRD manufacturers. With the existing experiences in low cost manufacturing plus the quality, product and technology emphasis, HK/PRD manufacturers will be able to produce specially designed products which are particularly suitable for the China market. These products would be the combination of the Western and Chinese customer taste and

Fig. 38: Future Development of HK/China Manufacturing Industries
(Market Bases)

	World Market		China Domestic Market	
	Low-cost Products	High value-added Products	Low-cost Products	High Value-added Products
ST	High	*Depends on HK Manufacturers' Commitment in Tech. Development Low	Low	X
MT	High Med.	Low Med.	Low Med.	X
LT	Med.	Med.	Med. High Low	Low

ST:Short Term

MT:Medium Term

LT:Long Term Development

Possible Development

style. HK/PRD manufacturers are in the best position to find out the western trend and fashion for modification to the Chinese requirements. This will provide a very strong competitive edge for HK/PRD manufacturers to explore the China market.

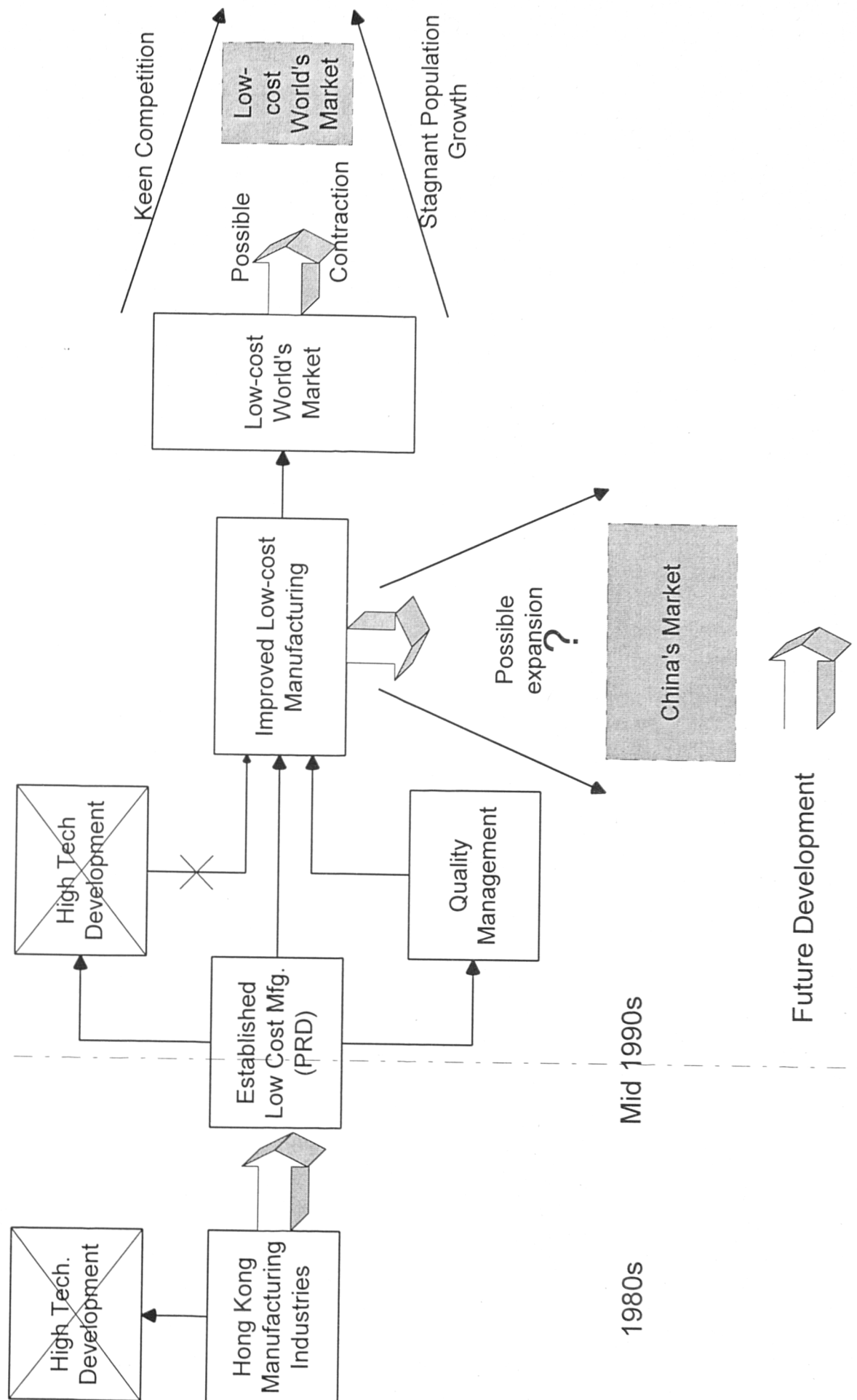
III.2 The Most Pessimistic Scenario(Fig. 39)

HK manufacturers have not woken up from their low cost dream. The wait-to-see, step-by-step and withdrawal approaches adopted have seriously damaged the HK/PRD manufacturing industries. They do not take up new technology because of the lack of political confidence and the strongly bonded 'customer's design' mentality. Many of the manufacturers are very satisfied with their existing low cost approach without doing anything extra to upgrade themselves until the market vanishes.

III.3 The Most Likely Scenario

From the survey and the interview findings, most of the SMEs in HK, i.e. the average HK/PRD manufacturers, do not have concrete plans to upgrade their technology in new product design and process automation. Many of them have talked about technology development but very few of them commit themselves in implementation. The competitive world will not wait for the HK/PRD manufacturers to move. The competitors are improving very quickly in enhancing their technical and managerial competence. If the HK/PRD manufacturers do not wake up right now in upgrading their technical know-how, the worst scenario is likely to occur. The future of HK/PRD manufacturing industries depends very much on the effort and determination of HK manufacturers. Since most HK manufacturers have benefited significantly by their HK/PRD operations, the retained earnings are a bonus for them. Without China's open door policy, HK manufacturers would not be able to achieve what they have obtained right now. For long term survival, they should invest in high technology development. The recent industrial automation study

Fig. 39: Future Development Strategies for HK/PRD Manufacturing Industries
(The Most Pessimistic Model)



in HK(HKPC, 1992) indicates that many high technology suppliers find that the HK market is too small for them. By pooling China's market together, many of them will be interested not because of HK only but also the opportunity to explore China's market. In addition, by consolidating the very specialized R&D talents in China together with the newly developed R&D forces in HK, a very strong R&D support can be developed for HK/PRD industries to step into the high technology territory. The cost for developing R&D talents in HK/PRD will not be too expensive as China has an adequate supply of low wage R&D talents. So the money is there, the R&D people are there, the technology is readily available, the two governments both HK and China are strongly supporting the move. The missing thing is the determination and commitment of HK manufacturers.

IV. Risks and Difficulties in China Operations

On top of the political uncertainty of investing and operating in communist society, there are many other risks and difficulties facing HK manufacturers investing in China: i.e. China's macroeconomic instability, social problems and other operational difficulties.

IV.1 Macroeconomics Instability

Since its economic reform, China has experienced periods of major macroeconomic instability with rapid increase in aggregate demand, accelerated investment, credit expansion, high inflation and deterioration of the balance of payments etc., i.e. overheating. (Bell M.W. & others, 1993) China has intended to use 'indirect control' or 'market-oriented' mechanisms, such as taxes, subsidies, interest rate and other financial, fiscal and monetary policy, to regulate its instability. However, the effective regulating function of these indirect controls depends very much on the successful operation of specific institutions, such as banking and other financial institutions etc. This indirect

system of macroeconomic management and institutions have been developed in the western market economy over a long period of time but have not been developed properly in China. China's inadequate market-based macroeconomic management systems are incompatible with the needs of the new economic order. The mechanisms and instruments to affect interest rates, prices and exchange rate, do not always reflect the underlying demand and supply conditions. Banks are not subject to the discipline of the market in their loans policy. The legal and regulatory systems are immature. These have led the authorities to resort to central administrative intervention to stabilize the overheated economy.

Decentralization, devolution of powers and diminishing the role of the Centre have led the instability to become more and more difficult to be administered by the central power. The decentralization of authority to local government and enterprises to set prices, to initiate investment projects and to engage in foreign trade etc. has led to significant macroeconomic imbalance due to sharp rises in imports, increased investment and inflation. Furthermore, with the introduction of the contract responsibility system, most enterprises negotiate contracts specifying tax payment in nominal terms rather than on their profits. This has led to perverse automatic stabilizers of the taxation system.

To overcome the macroeconomic instability in China, reform must be as comprehensive as possible and must include at an early stage the development of indirect instruments for regulating the economy. The new phases of reform should be accompanied, as far as possible, by appropriately tight financial policies. China must develop the capability to manage economy through indirect means. This need has been more acute because as

economic reforms have deepened and decentralization has accelerated, administrative controls are becoming less effective. Jan S. Prybyla in her “Reform in China and other Socialist Economies”(Prybyla J.S., 1990) has pointed out the fundamental problems of the socialist system in economic reform as ‘The socialist system fails to provide an automatic spontaneous mechanism that would reconcile individual and social preferences and transform individual strivings into socially beneficent outcomes. In capitalist economies such a mechanism, is supplied by the competitive market.’ In socialist economic reform, irrespective of the kinds of reformation policy adopted, e.g. Gradualism in China or Big-Bang approach in Russia, the success depends very much on the effective establishment and the smooth operation of the automatic spontaneous mechanism supplied by the competitive market. In order to strengthen the effectiveness of this indirect control mechanism, like many other socialist countries, there are many things that China should do. Some of these things are listed as follows:

1. To strengthen the competition in the banking sector by facilitating the growth of well-functioning financial markets for inter-bank transactions and freeing the specialized banks from the obligation to undertake ‘policy lending’.
2. To establish appropriate legal and regulatory frameworks.
3. To privatize the SOEs, to make them subject to the discipline of the market, to phase out loss-making SOEs and to deny credit to uncreditworthy SOEs.
4. To further reform price for reducing the burden of subsidies on budget.
5. To abandon the contract system of taxation and to establish uniform enterprise tax systems for ensuring the automatic stabilizing effect of the tax system
6. To open and liberalize trade and exchange systems to provide a mechanism for automatic adjustment in the economy, etc.

During the transitional period, it will be necessary for the authorities to use a combination of both direct and indirect instruments. Available direct instruments should be altered to minimize their distortion effects and increase their effectiveness.

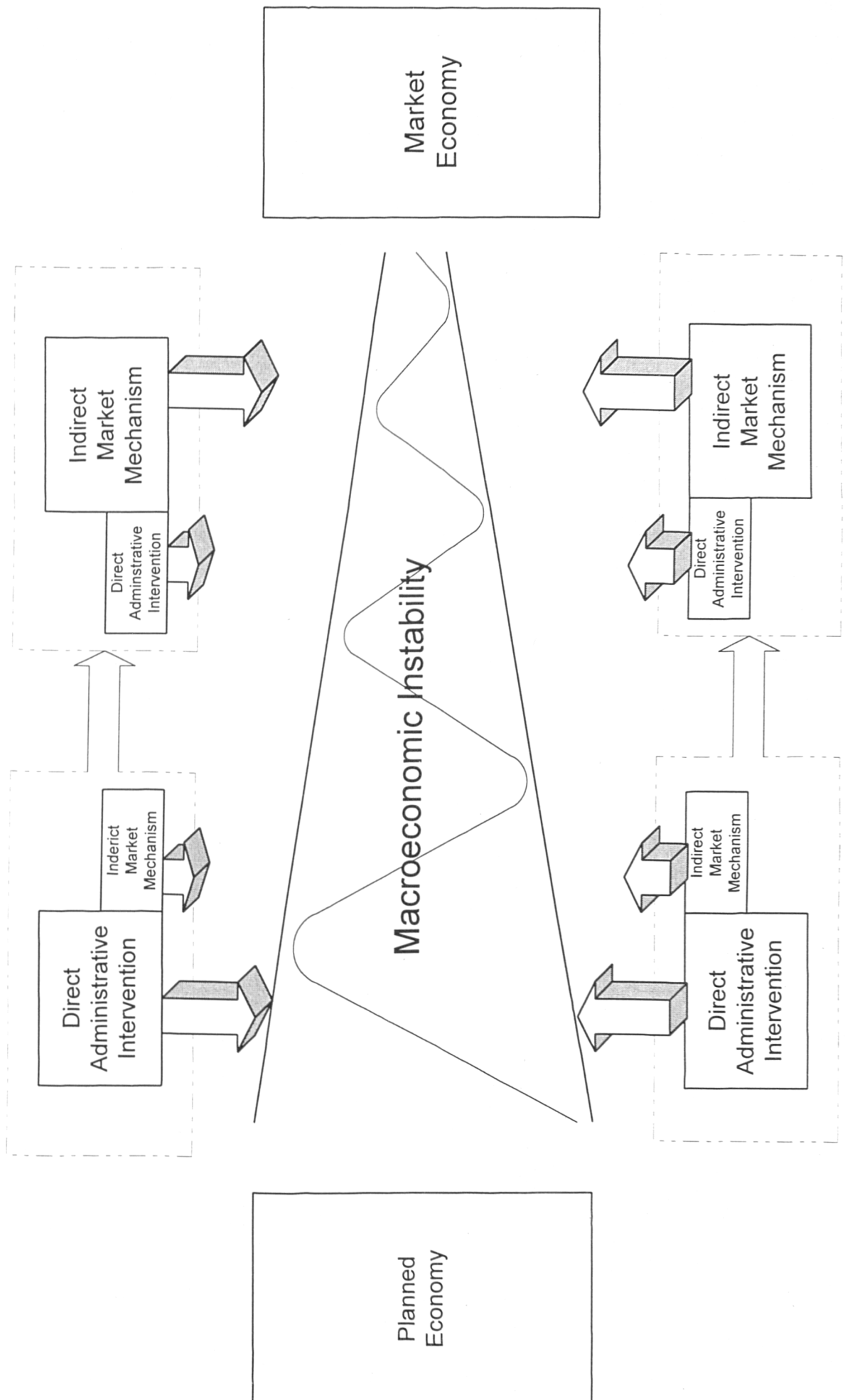
These are some of the important things that China must do in order to avoid the recurrence of macroeconomic instability and the subsequent political unease such as the June 4th event in Tiananmen Square in 1989. A comprehensively open economy will reduce the direct intervention of administrative powers by facilitating the indirect economic control mechanisms to stabilize the economy. The targeted model of managing macroeconomic instability in China is highlighted in Fig. 40. This is the process to transfer planned economy to market economy that most authorities would like to see, i.e. the macroeconomic instability is gradually reduced and regulated by the indirect market mechanism.

All these suggestions are easier to say than do. How much China can achieve will determine how healthy will be the reformation of China's economy. The risks for HK manufacturers to expand or maintain their operations in China depend on whether China can properly manage the macroeconomic instability through the indirect control mechanism of the market system. Past experience has shown that serious macroeconomic instability can often lead to political unease such as the Tiananmen Square incident in 1989 mentioned above.

IV.2 Social Problems:

Inequality: Deng's philosophy of 'Letting some get rich first' has really made some become millionaires overnight and left millions of rural residents struggling for food and basic needs for a healthy life.(Thurston A.F., 1994) At present, there are still a quarter of China's rural population with no access to tap water. There is a lot of jealousy or the

Fig: 40: Transition From Planned Economy to Market Economy:
Macroeconomic instability Cycles



Chinese so called 'red-eye disease' to the success of the new entrepreneurs, in particular, when money is made not through productive activities but through trade or speculation. Some of the less prosperous feel cheated out of their share of the pie. It does not seem right that entrepreneurs, many of them with little training and education, become millionaires overnight or earn much more than professors, lawyers or engineers. Nor does it seem fair that relatives of high-ranking officials could take advantage of their relatives' position to collect personal fortunes. The social relationships and the rules of behavior are in a state of disarray. A. F. Thurston has pointed out the Chinese social disorder by the following statement: 'Chinese used to say that everything that was not explicitly permitted was forbidden; now everything that is not explicitly forbidden is permitted.' For example, the cost of government banquets at taxpayer expense, was calculated at Yen83-86 billion in 1994-more than the combined annual government expenditure on education , culture, science, and health care. The personalized rule, the 'quanxi'-i.e. the connection to get things done, and the decentralization of authorities to a large numbers of local leaders are important sources of problems leading to social disorder. The trend for begging is growing and the government lacks the will or means to stop it. The population has reached 1.2 billion, the gap between the rich and the poor is extremely large and the pace of change is rapid and dramatic.

Overstress on workers: there is mass migration of people, in the range of 70-100 millions, from rural provinces to urban cities. This has imposed tremendous strains on the cities social services. Because of this unlimited supply of rural workers, it has been typical that young men and women from the countryside work voluntarily in factories for 14 hours or more a day , seven days a week. The young rural people are willing to learn new skills so that they can join the 'Modern' world. However, will China's industrial workers begin

to organize and take collective action for better working conditions, shorter hours, more secure jobs and higher pay? And how would the Communist party respond to workers behaving the way Marxism says they should? In communist ideology, a worker or poor peasant was good. Capitalists and intellectuals were bad. With the reforms, this communist hierarchy has gone. The business men have become rich and important. China has more than 150 million redundant rural workers and expects at least 50 million more by the end of the century. The potential leading to social unrest and chaos due to mass unemployment will be extremely high if not properly managed. (Hornik R, 1994)

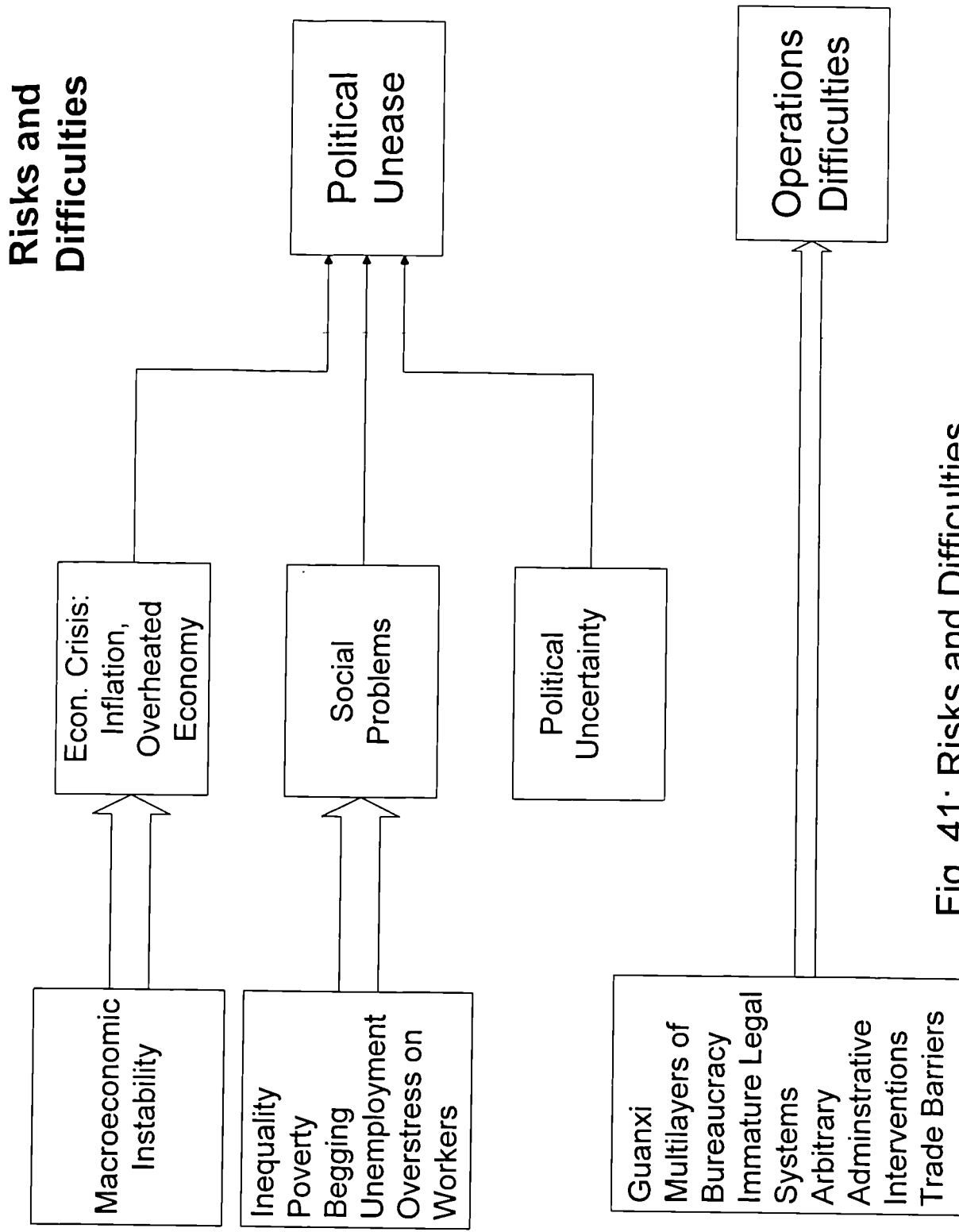
IV.3 Operations Problems: there are many other operational problems encountered by foreign investors, in particular, the early entrants. The major problems include: The undeveloped infrastructure in communications, transportation and power which usually take decades to develop; the policy-related problems inherent in command economy, such as restricted access to the use of land and labour, immediate goods and raw materials etc.; the multi-layers of bureaucracy and politicians to confuse investors on which officials: national, provincial or local have the power to make a deal; the absence of a well-functioning and independent legal system etc.

IV.4 Trade Barriers: USA is so far the largest export market for Hong Kong and China. In recent years, either due to political or economic reasons, there have been frequent occasions that US and China almost fell into serious trade war. In 1994, US accused China produced millions of dollars worth of counterfeit copyright goods. US initiated a Special 301 investigation and announced a possible US\$1 billion of sanctions on Chinese exports with import tariff imposed at as high as 100% rate on certain Chinese goods. (Sands L.M. & Lehr D., 1994; Managing Intellectual Property, 1995) China eventually committed to bring under control the piracy of US products by taking effective

steps to protect intellectual property meeting the US requirements to avoid the war. However, this had affected to a certain extent the export trade to US market in 1994/95. Many of the concerned US buyers at that time committed only to short term, small volume contracts/orders to avoid unnecessarily heavy tariff. The human rights problems in China also created serious difficulties and uncertainties for export to US market until President Clinton stopped to use the Most Favour Nation(MFN) status as weapon to force China to improve its human rights problems. Furthermore, whether and when China can join the World Trade Organization(WTO, formerly GATT) will also affect the performance of HK/China manufacturers substantially.

IV.5 Uncertainty: There is also tremendous uncertainty over whether and how long the new prosperity will last. There is uncertainty over what will happen following the death of Deng Xiaoping. There are many different possible scenarios following Deng's death: The most optimistic model projects that economic growth will continue relatively smoothly, accompanied by gradual political reform. However, the most pessimistic model, expects a reasserting of tight central control over both economy and individual behaviour while the centre attempts to maintain good economic progress. The possibility of government immobilization and a consequent spread of chaos are also expected in this model. The most likely scenario may be somewhere in between.(Thurston, 1994)

The abovementioned risks and difficulties in China operations are summarized in Fig. 41. This is the time of great danger and great opportunity, just as the good and the bad are mixed together in economic reform. What will happen in the future depends very much on how China can handle the above problems and difficulties. Many Hong Kong manufacturers came to Hong Kong as refugees in the 1950s, 60s and 70s. Most of them



**Fig. 41: Risks and Difficulties
in China Operations**

had experienced the most difficult time of the China's closed economy era plus a lot of painful political experiences. How much confidence these people have on China to overcome all the risks and difficulties mentioned above in its economic reformation process, will determine substantially their future investment strategies. The aggregate strategic decisions of the HK manufacturers will affect the long term industrial development strategies of the HK/PRD manufacturing industries.

V. Recommendation

V.1 Risks and Difficulties

Many HK manufacturers understand there are a lot of difficulties and risks in China's economic reformation process, in particular, the periodic cycles of macroeconomic instability, the inequality in society, the ill-structured fiscal/monetary policy and the immature legal system etc. These difficulties may lead to political unease. This makes it risky to invest in China but this is also a great opportunity. By looking back over the last one and a half decades, no matter how bad was the economic and political situation, the HK/PRD manufacturers' operations have seldom been disturbed. Factories were still operating smoothly without intervention straight after the Tiananmen Square event in 1989. It seems that providing the operations are really generating real wealth to the society, unless something which is really desperate like war or another cultural revolution, the operations should not be seriously affected. This is particularly true for export oriented manufacturing industries. Because of this uncertainty, many HK manufacturers are very interested in the payback period of their new investment in China. It may be difficult to withdraw their invested capital from China in case of political unease. Providing the payback period is short, their risks will be low. This is why most HK manufacturers

hesitate to invest in high technology and R&D development as the payback period for most of these investments are usually long.

V.2 Quality Emphasis

From the surveys and the interview findings, the average SMEs are enjoying very much the low cost advantages of their China operation. Many of them are aware that customers are demanding more and more quality and timely products at competitive prices. This is why most HK/PRD manufacturers pay high attention to quality management. HK manufacturers should continuously support the quality movement in their China operations by transferring and diffusing QM practices and system through proper training to China. The “ISO9000-CQI-TQM” QM journey is recommended.

V.3 Expansion within PRD

Many of the HK manufacturers do not have plans to expand their operations in China beyond the PRD region because of the inadequate logistic supports and the distance from HK. However, some of them have plans to expand beyond the three major cities of PRD, which at present constitute 80% of the total HK investment in PRD, to the smaller cities in PRD for cost saving purposes. The transportation systems within PRD region have been improved significantly which facilitate the move beyond the major cities in PRD. With the completion of the massive infrastructure and transportation projects in the next few years, both in HK and PRD, the problems of transporting cargo between HK/PRD would no longer restrain the rapid development of the region.

V.4 Gradual reduction of Low Cost Advantages in PRD

The cost advantages of China operations are reducing gradually due to the increase in taxation, inflation and much more stringent government requirements in environmental protection and safety aspects etc. Many HK manufacturers complain that the uneducated

rural workers are extremely difficult to train and retain. Many of them have no or very limited experience of the requirements of the sophisticated modern society. More importantly they are coming primarily for money purpose. They change jobs simply because other firms offer them a few dollars more. This has led to very high labour turnover rate. Training of newcomers has become a major part of operations. Because of the poor education background and attitude of rural workers, substantial inspection is required. There are a lot of rejects, scrap and rework in the plant. The high turnover rate of workers have led to substantial increases in operating costs. However, productivity does not increase at the same pace to match with the increase in cost. Together with the keen competition from other developing countries and more importantly from the other HK manufacturers in PRD, the potential to increase price has been substantially reduced or even in many cases led to price reduction. HK manufacturers should look for longer term plans to reduce operating costs. The emphasis on quality, product design and process automation would be the recommended means to improve quality and productivity.

V.5 China's Domestic Markets

The chance for HK manufacturers to explore China's domestic market is positive. Many HK manufacturers put their emphasis in this direction. They expect that through their long term 'guanxi', i.e. connection, with the local authorities they should be able to share a certain portion of the huge cake. Through the existing world market business connection and marketing information, many HK manufacturers should be able to modify the western fashion and styles to suit China domestic customer requirements. The competition from the local Chinese manufacturing industries is the threat to HK manufacturers but still it will take some time to come. The reasons are the lack of entrepreneurship, capital, management and marketing know how of the Chinese people. The Chinese TVEs have been very

successful in the last decade in the joint venture or other contractual business with HK manufacturers. They have retained large portions of their profit. However, these TVEs are owned by the local authorities so that they are responsible for a lot of other social development works in their own society. They need a lot of capital to develop their own social activities, such as education, medical, infrastructure etc. The TVEs still prefer to rely heavily on the financial, technical and managerial support from HK manufacturers for new venture ideas. This is why HK manufacturers have good opportunities to participate in new ventures with TVEs to explore the China domestic market. Regarding the possibility of competition from the Chinese private sector, the chances are not high. Most of the existing HK/PRD joint venture companies are owned by the TVEs. The private sector does not have the technical and managerial know how for manufacturing. They also do not have the experience and capital to start their own manufacturing. Competition from SOEs is even more slim due to their inefficient and ineffective operations. This is why a lot of small and medium sized HK manufacturers are still taking the wait-to-see attitude in upgrading their technology. The biggest threat in exploring the China market comes from the trade protection of the Chinese government. With the continuous pressures from other countries for a more open China market, the extremely high trade surplus balance of China to most other trading partners plus the Chinese government's desire to join WTO(formerly GATT) in the near future, the chance to enter China's domestic market should still be there. But it may not be as optimistic and simple as most of the HK manufacturers expect. In the medium term, the TVEs will become wealthy enough to participate actively on their own in the light manufacturing industries and to compete with the HK manufacturers. In addition, the macroeconomic instability of China's economic reformation process will affect China's domestic markets dramatically. By solely focusing on the low cost approach

with China's domestic market as their primary target, HK manufacturers will soon confine themselves to the highly volatile local market. This may not be a reliable, safe and viable strategy for HK/PRD manufacturers.

V.6 Retention of Low Cost International Market via Technology Upgrading

Most HK manufacturers do not want to lose their existing international market share. Many of them are considering upgrading their technologies to improve their competitiveness. But most of them are moving very slowly, this is partly because they are still very comfortable in their existing operations and partly because they overlook the time requirement to introduce high technology. They are still pre-occupied by the “manufacture to customer's design” mentality in which they can simply buy the technology when they need it but forget that new technology needs time to search, absorb, develop and integrate into their existing manufacturing system. More importantly, new product design and high technology development needs R&D expertise which require substantial time to develop. In advanced technology development, the HK manufacturers' “wait-to-see” strategy has become the “always-waiting” strategy. In the technology journey, the time to decide is always “now” but not “future”. You have to step into it, either big or small, otherwise it will never come. Hong Kong manufacturers should move now.

V.7 Stepping into the New product and High Technology Territory

With the limited knowledge and experiences of the HK manufacturers in High technology and R&D development, most HK manufacturers don't know what to acquire, how to acquire, when to acquire and where to acquire technology. How is this situation to be overcome? The ISO9000-quality movement is a good example to demonstrate how HK manufacturers can successfully adopt something new to them. Before the introduction of ISO9000, HK manufacturers did not even try to understand what is quality, how could they

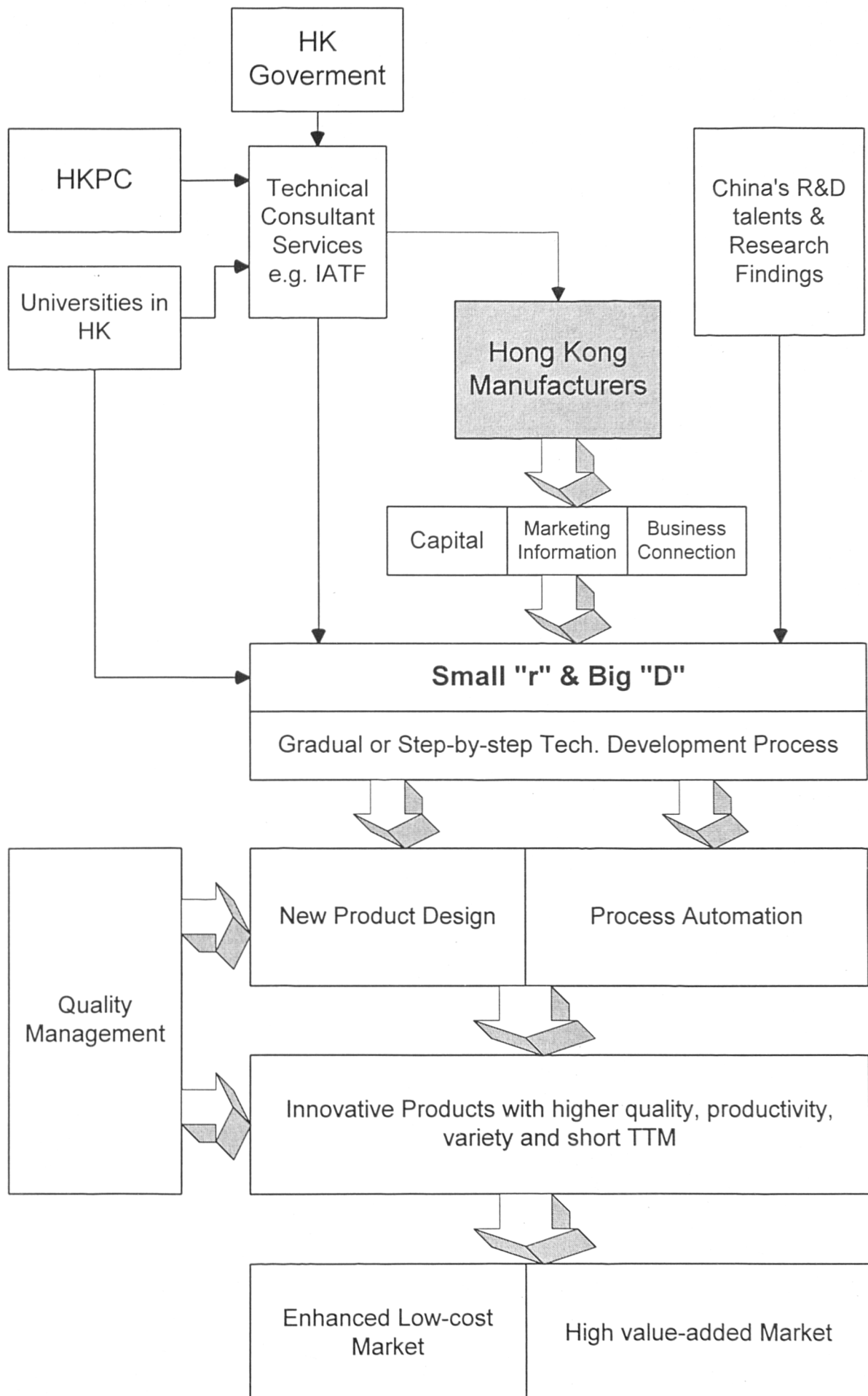
be benefited by 'quality'? After ISO9000, they understand more about quality systems and are convinced the successful execution of the system will be the way to success. Similarly, for new product design and process automation, HK manufacturers must be given the opportunities to understand more about them and be convinced by the benefits of implementing high technology. In this respect, the Industrial Department of Hong Kong Government has initiated an Industrial Automation Task Force(IATF) to provide Industrial Automation consultancy services to industries at minimum cost via the organization of the Hong Kong Productivity Council and the contributions of several universities in HK. The IATF helps industries to identify areas for improvement in their operations via appropriate available industrial automation techniques. IATF identifies the most appropriate automated soft and hard technology for the company concerned, suggests the source of supply of technology and assists the implementation of the automation projects. These types of services, which are heavily subsidized by the HK Government, provide industries with the opportunities to explore the high technology territory. By understanding more the benefits of high technology through successful implementation, HK manufacturers will be convinced to adopt the technology-based approach. After that, they will invest more in this area. Hong Kong manufacturers should make use of the IATF or similar services provided by the Hong Kong Government as a stimulant to gradually step into the high technology territory. By taking this step-by-step approach, HK manufacturers can understand more about the advantages of improving productivity, quality, variety and time-to-market through technology and quality management with minimum capital investment. HK manufacturers should work together with the universities in HK to explore China's R&D talents. Because of the limited research experience, HK may start with the small 'r' and big 'D' approach', i.e. more emphasis on commercial product development based on China's

existing research findings, and gradually migrating to big “R” and big “D” with heavy emphasis on both Research and Development. HK Research centres can be established in Shenzhen area, which is next to the HK border, to facilitate both the HK and the Chinese researchers to work together. As mentioned earlier, the cost for hiring top calibre Chinese researchers are comparatively cheaper than most developed countries. Through these joint HK/China research efforts under the leadership of the HK entrepreneurs, it would be possible to introduce innovative products and new methods of production. As mentioned earlier, everything is ready except the strong commitment from the HK manufacturers. Of course, in order to derive the most appropriate business strategies each individual manufacturer needs to analyze his own strengths and weaknesses against the opportunities and threats available and facing him. HK manufacturers should look at the overall situation as a whole on a more global and long term basis by investing more in high technology research and development. They should not just be satisfied with their existing low cost approach and hope for the best in China’s domestic market as their long term goal. The recommended high technology development process is summarized in Fig. 42.

V.8 Transitional Point at the Cross Road

In the mid 1980s, because of the shortage of labour, increasing land costs and keen competition from developing countries, Hong Kong light manufacturing industries had reached a transitional point at the cross-road, i.e. either to go for internationalization or upgrading technology or both. With the open door policy of China, HK manufacturers selected the simplest way of relocating most of their low-cost labour-intensive activities to China without upgrading technology. This industrial strategic decision has led to marvelous economic success for both HK and China in the light manufacturing industries. However, this decision has also stopped the technological progression of HK

Fig. 42: Recommended High Technology Development Process for HK/PRD Manufacturing Industries



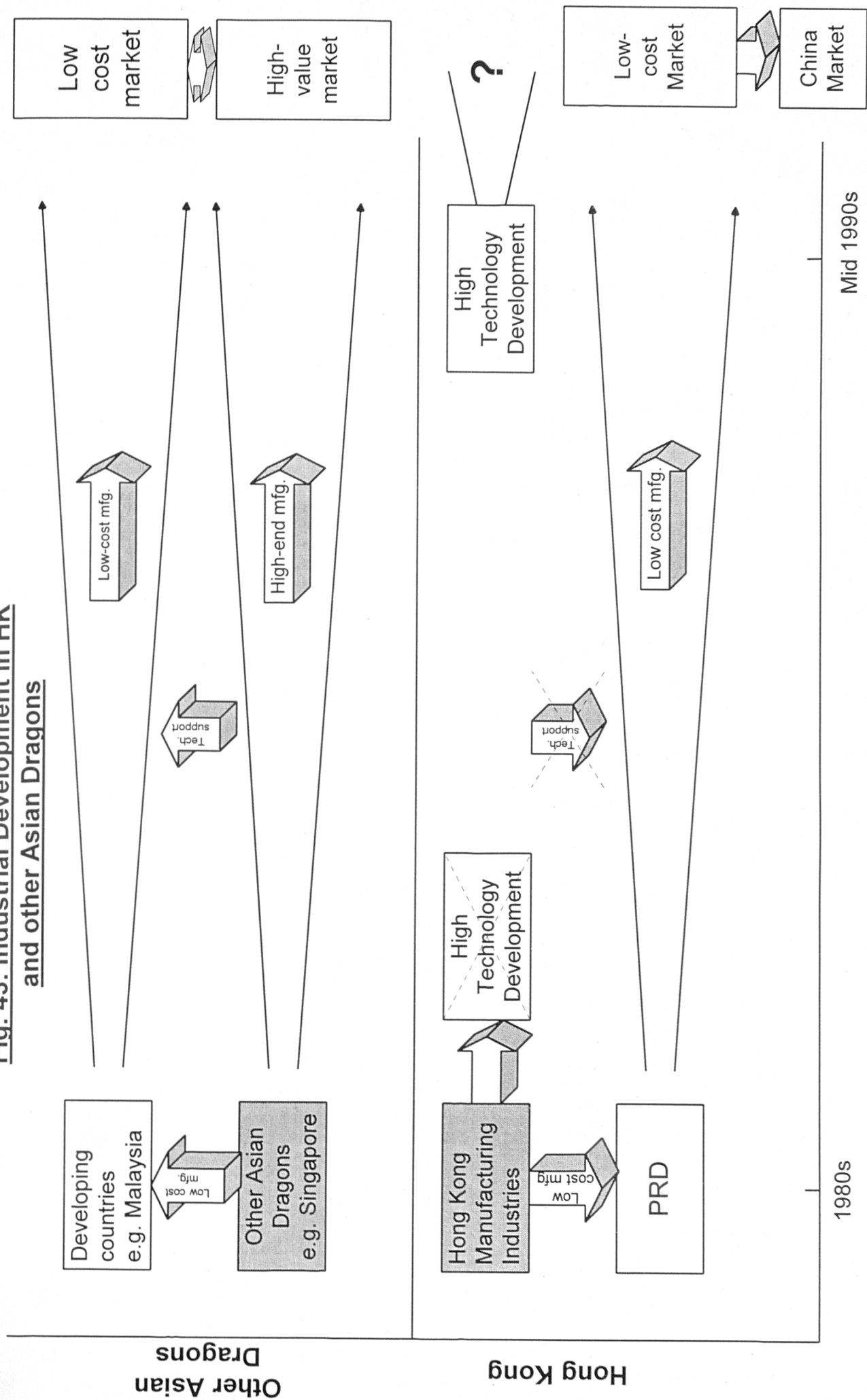
manufacturing industries for more than 10 years behind the other three Asian dragons, i.e. South Korea, Taiwan and Singapore(Fig. 43). In the mid 1990s, HK manufacturing industries are facing another important strategic decision at the cross-roads again of either:

1. To maintain the low cost manufacturing territory without technology upgrading. This will lead to the gradual reduction in the share of the low cost world market because of competition. However, the loss is expected to be partially offset by the gradual increase in the share of China's domestic market, or
2. To upgrade technology, to retain the existing share of low cost world market, to possibly expand to the new higher value-added world market and at the same time to explore the China domestic market.

Through extensive interviews with a large number of HK manufacturers and academics in the field, it has been observed that many of the HK small and medium size manufacturers are still keeping the wait-to-see attitude which probably will lead them to the decision of alternative 1. This is because they are very comfortable with their existing low cost operations, they expect that the China domestic market will provide them with good opportunities for many years to come.

Many other developed countries, like USA, Japan, Western European Countries and even Singapore, have come across this similar situation by facing high wages and land costs in their industrial development process. They have overcome the difficulties by making their decision with a mix of strategies, i.e. both internationalization and technology upgrading. These countries usually have strong support from their governments in R&D. Hong Kong is the place which only takes the simplest approach by relocating low cost manufacturing activities to China. Hong Kong is also a place without proactive government support in high technology development. Everything is left with the industries to decide. For a

**Fig. 43: Industrial Development in HK
and other Asian Dragons**

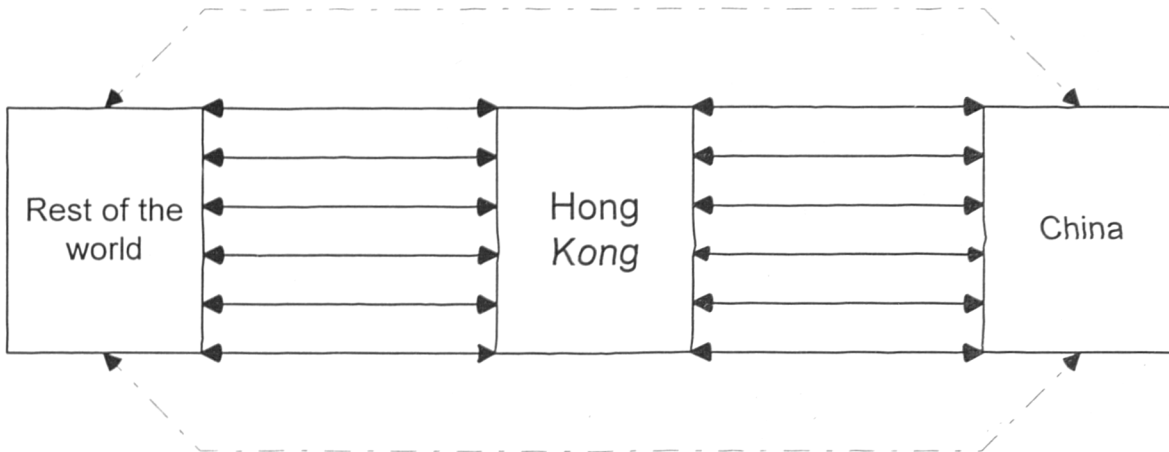


country like China with such a low economic base, what ever they get in the reformation process will be a bonus for them, because they do not have much to lose. However, for most of the HK small and medium sized manufacturers with limited capital, say 50 million HK\$, it would be too risky for them to invest half of their fortune in such a volatile economic reforming country. It would be even more uncertain for them to invest in the risky high technology industries in which they have very little or no experience. The potential political upheaval in China has made the HK manufacturers more reluctant to invest in the long payback period high technology industries. So from their point of view, the wait-to-see strategy would properly be the most appropriate choice for them. Because of the aggregate industrial strategic decision of not upgrading technology made in the mid 1980s, HK has been more than 10 years behind the other three Asian dragons in the technology journey. If the same strategic choice is to be made again in mid 1990s, the contribution of HK to the HK/PRD manufacturing industries will vanish. HK manufacturers can no longer be considered as an active contributor to HK/PRD manufacturing industries but just an investor. The soft and hard linkages between HK/PRD have been discussed previously. Let us examine the contribution of HK to HK/PRD manufacturing industries by the soft and hard linkage models as follows:

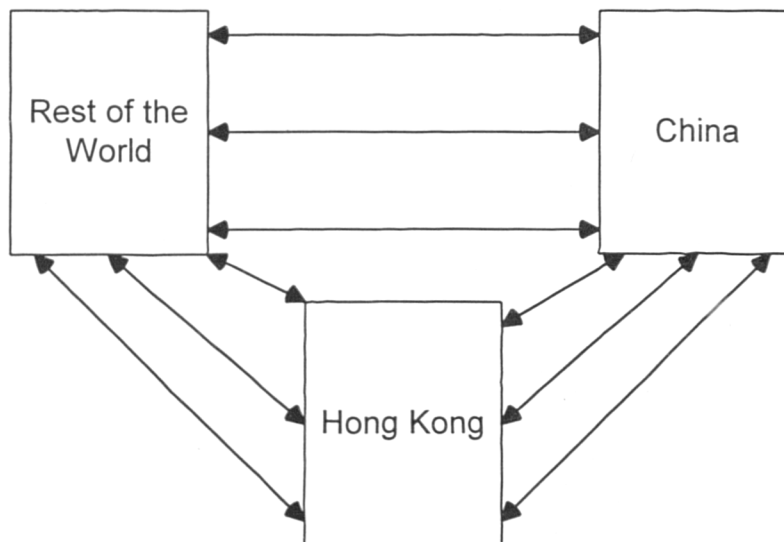
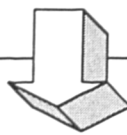
Soft-Linkage model:(Fig. 44)

Many HK people may think that with the transferring of HK manufacturing activities to China, HK can be developed as a commercial and services centre to China, i.e. via the soft linkage model(Fig. 44a). Hollowing out the manufacturing industries to China and hoping that the soft link will bind HK/PRD together will eventually jeopardize the HK economy more. By hollowing out manufacturing without technology backup, it will hollow out the servicing industries as well(Fig. 44b). At present, this is what is happening in HK. Since

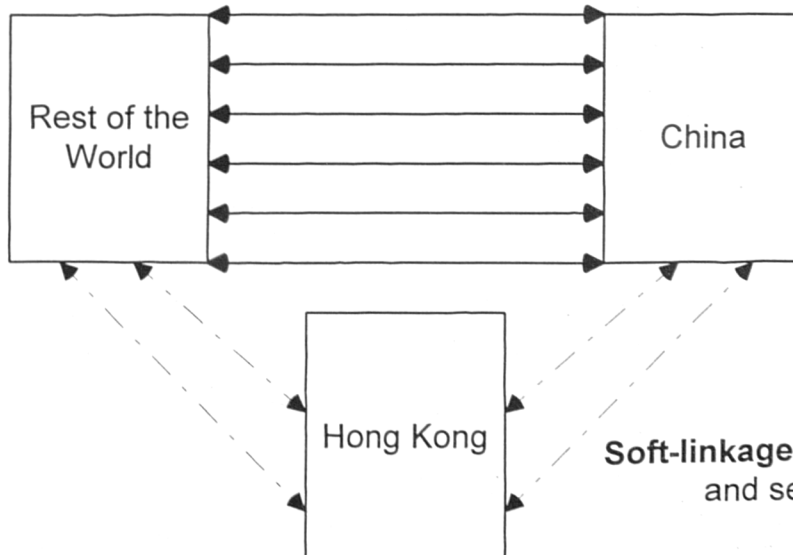
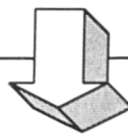
Fig. 44: Softlinkage Model: Importance of HK to China gradually phasing out



(a)



(b)



(c)

HK is only a middle man, overseas customers will eventually skip through HK and contact China directly by themselves(Fig.44c). That is why HK is hollowing out the hotel industries to China, as businessmen are travelling directly to China. HK is also hollowing out the labour intensive service industries, like the telephone operators in the paging service industries, the book keeping works in accounting services, the data entry activities in data processing industries and the backup services of the banking industry etc. to China.

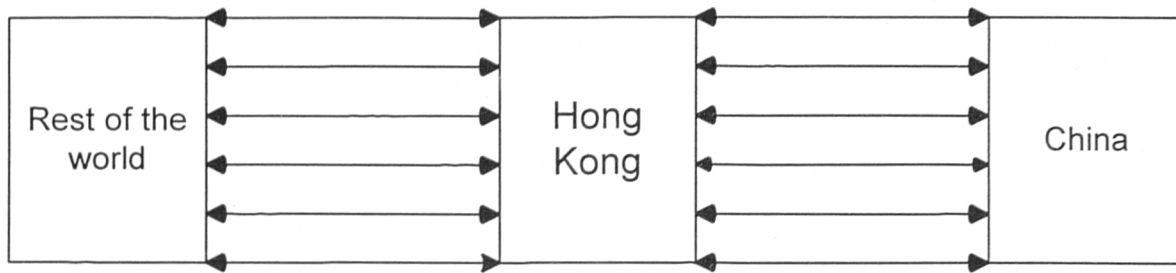
Soft/Hard-Linkage Model:(Fig. 45)

By going through the Soft/Hard-linkage model, on top of the soft contribution, like finance, marketing and logistics, there will be something solid, like product design and process automation, contributed by the HK manufacturers which cannot easily be taken over by China(Fig. 45a). Because of the limited commercial and technical knowledge, China would find it difficult to develop commercial products to meet the western customers requirements in the near future. With the strong commercial and marketing background of the HK R&D support plus the specialized China R&D talents, there would be good opportunity for HK/PRD to progress in innovative product development. HK manufacturers should always maintain the leading position over the Chinese in developing HK/PRD as an integrated world class manufacturing region(Fig. 45b & c). It would be unrealistic to expect that HK manufacturers will emphasize, new product and high technology development overnight. However, the step-by-step approach in this direction together with the existing supports from both the Chinese and the HK governments would be essential for the long-term development of the HK/PRD manufacturing industries.

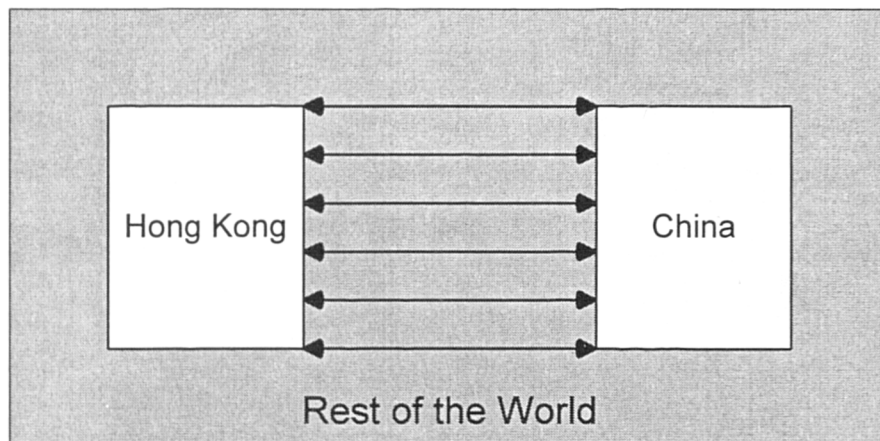
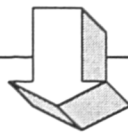
Fig. 45: Soft/hard-linkage between HK and China

Soft-linkage: Financial, commercial and services supports

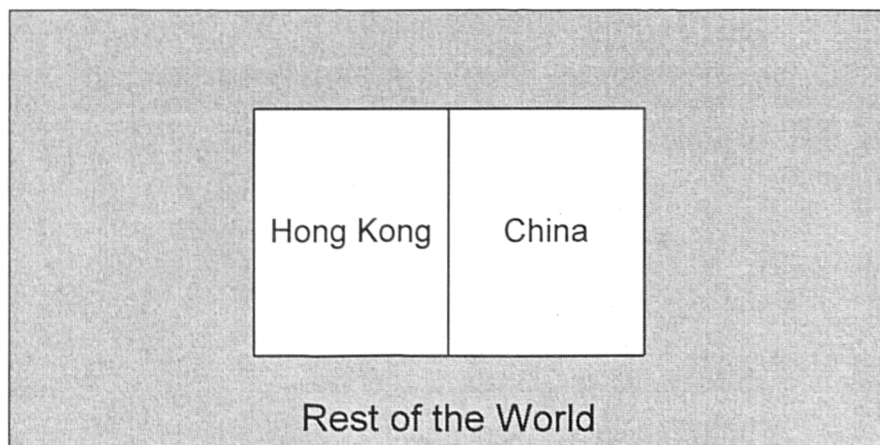
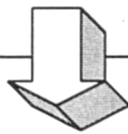
Hard-linkage: Design, technology and management know-how linkage



(a)



(b)



(c)

VI. Conclusions

Conclusions of the project are summarized as follows:

1. China Economic Reformation and Industrial Development: The Open-Door policy has completely reoriented the China's industrial development strategies to "growth through complete transfer of technology and management know-how via Foreign Direct Investment(FDI) with emphasis on light export-oriented manufacturing industries developed in Pearl River Delta(PRD) Special Economic Zone(SEZ) adjacent to HK."

2. Development of HK/China Manufacturing Industries: Hong Kong export-oriented light manufacturing industries explored in the 1950s, established in the 1960s, grew in the 1970s and saturated in the 1980s when HK faced with problems in escalating land/labour costs, keen competition and poor technology. *With the China's open-door policy, the low cost manufacturing operations extensively shifted to PRD.*

3. HK-China Linkage:

HK: HK is the source of finance, the commercial, technology and management know how transfer centre, the logistics and manufacturing support centre, the largest trading partner, the entrepot port and the trade facilitator for China.

China: China is the manufacturing base with huge supply of cheap land and labour, the top supplier, the largest re-export market and the second largest export market for HK.

HK/China Industrial Integration: The trades between HK/China, increased 200-300% from 1989 to 1993. In 1992, 70% of the FDI, i.e. over US\$10 billion, in China came from HK. China also had over US\$1.5 billion investment in HK. It is estimated that HK has established 25,000 firms in PRD employing over 4 million industrial workers. The HK/PRD manufacturing industries have been complementary to each other for the two places to sustain a double digit annual growth rate continuously in the last decade.

4. HK/China Manufacturing Industries-A Transitional Point at the Cross Road:

Critical operations management aspects have been reviewed and findings are summarized:

Quality Management: The poor quality practices before 1990 in HK have been improved significantly in the 1990s because of the introduction of the ISO9000 systems. On top of ISO9000 system, many manufacturers are working on Continuous Quality Improvement (CQI) towards Total Quality Management(TQM). China adopted whatever QM practices transferred from HK in a passive way. HK needs to help their Chinese partners to build up their own quality capabilities via the recommended HK's '*ISO9000-CQI-TQM*' quality experience. Current QM practices have formed a reasonable strong management system base for HK/China manufacturers to step into the higher-value added territory.

New product and High Technology Process Development: Current new product/high technology development in HK/China is well behind its competitor. With the improved support from both HK/China governments, the vast supply of R&D talents from China, the increased supply of more business oriented HK young R&D graduates, and the strong financial/marketing/business strengths from HK; HK/China manufacturers, if committed positively, should be able to establish strong R&D and high technology capabilities to compete in the demanding global market.

Logistics Systems in HK/China: Existing and future logistics development within PRD, between PRD/HK and between PRD/other China's major cities are good. The development between PRD/less developed inland provinces is largely neglected. HK manufacturers do not have plan to expand beyond PRD. However, to cut costs, they do have plans to move out from the three major cities in PRD to other areas of PRD.

5. Recommendation: This is risky but this is also time of great opportunity. For future development, exploring the low cost domestic market in China would be one of the

alternatives. However, HK manufacturers should also look for other alternatives to equip themselves by gradually migrating to new product/high technology development in order to lead rather than to be overtaken by the Chinese.

6. Future Researches: On top of the continuation of the studies in quality, product/ process and logistics management aspects, future researches can also focus on the followings:

i. Exploration of China Domestic Market and Investment in Shanghai for HK

Manufacturers: With almost two decades successful business relationship with the Chinese, HK manufacturers have established good connection to explore China domestic market. How to do it successfully would be a very interesting topic. After the successful regional development in PRD, China is opening Shanghai and other areas in a more comprehensive way. Whether and how HK manufacturers can participate in this round of China comprehensive reform would be another major topic for future researches.

ii. Remote Management Control System: Current Chinese accounting practices are improper to reflect company's true financial performance not to mention its appropriateness to facilitate management control (Shinha T., 1995; Adhikari A. & Wang S.Z., 1995). Most HK manufacturers control their China operations only on total costs basis. So far not much problems have been encountered, as overall costs are still far below HK. Time will come that a comprehensive cost control system on activity base is required.

iii. Macroeconomic Analysis: Most macroeconomic studies on China's reform focus mainly on the overall China's economic performance. Very few analyse specifically the development of HK/China manufacturing industries. Current study analyses the situation mainly from the HK manufacturers' strategic and operational point of view. To combine the two approaches in future work would definitely provide a more comprehensive picture for HK/China manufacturers.

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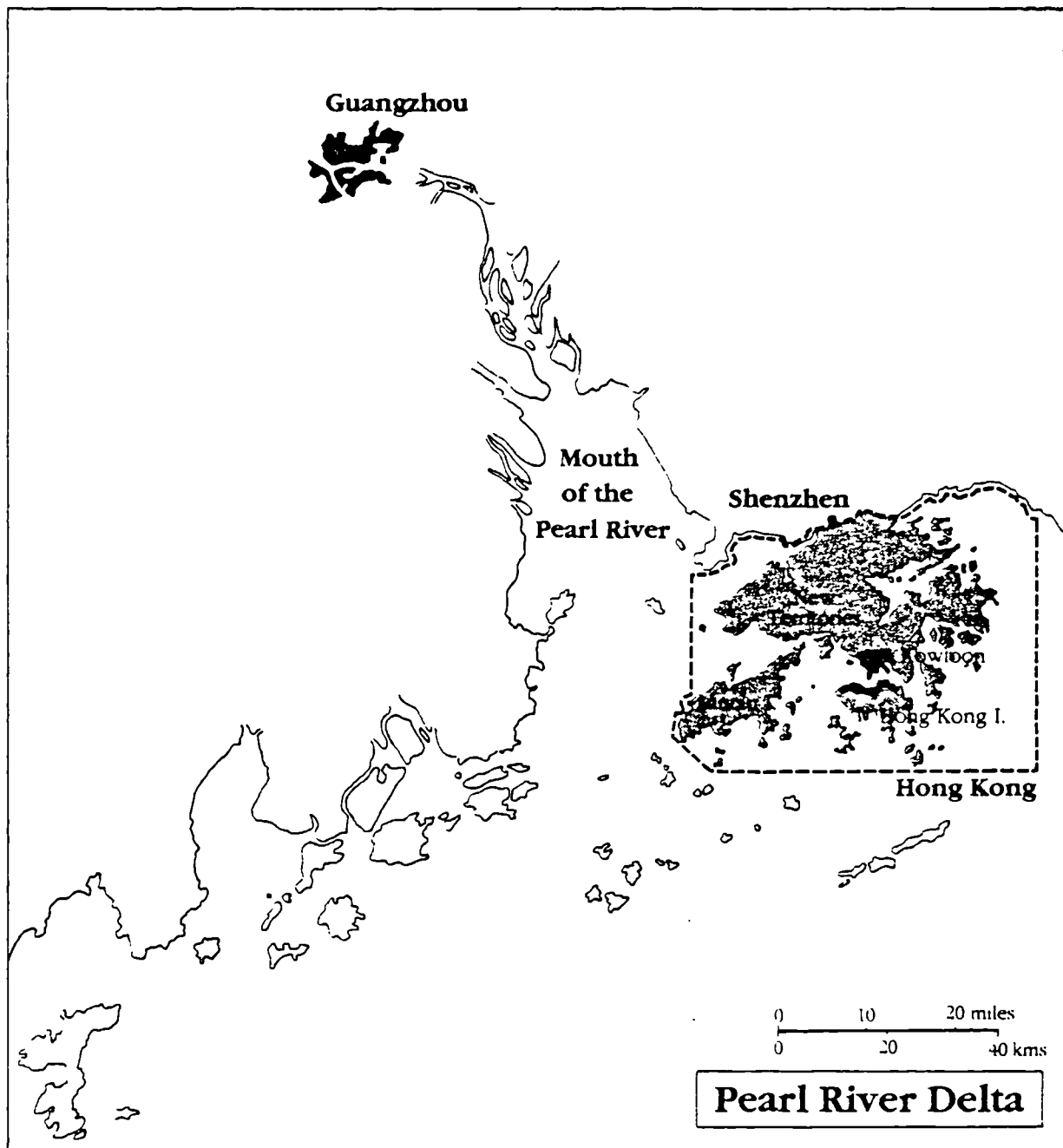
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Appendices

1. Hong Kong and Pearl River Delta Region

2. Sample List of Companies Interviewed

3. Questionnaires



Appendix: Sample List of Companies Interviewed

ABC Computer Co. Ltd.

ASTEC Components Ltd.

GPE International Ltd.

Informtech Co. Ltd.

Islandwide Enterprises Ltd.

LICC Manufacturing Co. (Far East) Ltd.

Lotus Onda Industrial Co. Ltd.

Mandarin Offset Ltd.

Maxtor(Hong Kong) Ltd.

Mayin Garment Ltd.

Mitel-Advent Technologies Ltd.

Primatronix Ltd.

Rising Sun Industrial Co. ltd.

Technophone Manufacturing (HK) Ltd.

Tektronix Hong Kong Ltd.

Unitoys Company Ltd.

Varicraft Manufactory Ltd.

Background of your company

1. When did your company set up?

- | | |
|--------------------------|--------------------------|
| 1. Before 1975 | 2. Between 1976 and 1980 |
| 3. Between 1981 and 1985 | 4. Between 1986 and 1990 |
| 5. After 1990 | |

2. Which of the followings best describes the business nature of your company?

- | | |
|-----------------------------------|------------------------------------------|
| 1. Electronic | 2. Electrical products |
| 3. Mechanical products | 4. Optical products |
| 5. Toys | 6. Wearing apparel |
| 7. Textiles | 8. Plastics, rubber and leather products |
| 9. Paper and printing | 10. Food and beverage |
| 11. Metal products and machinery | 12. Mold and die |
| 13. Chemicals and pharmaceuticals | 14. Jewelry |
| 15. Others (Please specify) _____ | |

3. What kind(s) of products does your company produce?

- | | |
|----------------------------------|----------------------|
| 1. Clothing | 2. Toys |
| 3. Clocks / Watches | 4. Consumer products |
| 5. Printing material | 6. Processed food |
| 7. Electrical appliance | 8. Jewelry |
| 9. Others (Please specify) _____ | |

4. How many staff are employed in your company in Hong Kong? (please select the appropriate & fill in the number)

Department / Function	HK
a. Production processes	_____
b. R & D	_____
c. Quality assurance	_____
d. Administration	_____
e. Sales & marketing	_____
f. Financial management	_____
g. Others (Please specify _____)	_____

5. Has the production process of your company been moved / started in China?

1. No production processes has been shifted to China. (PLEASE GO TO QUESTION 7)
2. All the production processes have been moved to China.
3. _____ % of the production processes have been moved to China
4. All the production processes have been started in China since your company set up
5. _____ % of production processes have been started in China since your company set up

6. When did your company start to move the production processes to mainland China?

- | | |
|--------------------------|--------------------------|
| 1. Before 1979 | 2. Between 1979 and 1984 |
| 3. Between 1985 and 1989 | 4. Between 1990 and 1992 |
| 5. After 1992 | |

PLEASE GO TO QUESTION 8

7. Why hasn't your company shifted the production process to mainland China? (Please rank the following reasons in order of importance, 1 : the most important)

- a. Lack of political confidence
 b. Difficult to remote control
 c. Logistic problem
 d. Unreliable quality
 e. Poor labour skill
 f. Unfamiliar environment
 g. Difference in culture and custom
 h. Immature rules and regulations
 Please specify the other reason(s) below:

PLEASE GO TO QUESTION 9.

8. How many staff are employed in your company in China? (please select the appropriate & fill in the number)

Department / Function

China

- a. Production processes
 b. R & D
 c. Quality assurance
 d. Administration
 e. Sales & marketing
 f. Financial management
 g. Others (Please specify _____)

9. What amount of capital has your company invested? (please put a tick in the appropriate blanks)

a. HK

b. China

1. Less than HK\$500,000
 2. \$500,000 - \$1,000,000
 3. \$1,000,000 - \$5,000,000
 4. \$5,000,000 - \$10,000,000
 5. \$10,000,000 - \$15,000,000
 6. \$15,000,000 - \$20,000,000
 7. \$20,000,000 or above

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

10. What is the percentage of your company's total output in Hong Kong / China and other countries? (Please circle the appropriate and fill in the blanks)

Percentage of total output

- a. Hong Kong
 b. China
 Other countries, please specify
 c. _____
 d. _____

11. Where is the head office and factory / branch office of your company located? (please circle the appropriate)

Type

Location

a. Head office

1. Hong Kong / 2. China / 3. others (please specify) _____

b. Factory / Branch office

1. Hong Kong / 2. China / 3. others (please specify) _____

Quality Management in Hong Kong and China

Section One : Quality management practice in your company

Note : If your company does not have plant in China, please answer the HK column only, otherwise, please answer both the HK and CHINA columns. Unless otherwise stated, please choose only one answer for each question.

- | | | | |
|-----|---------------------------------------------------------------------------|----|-------|
| 1. | Does your company have a Quality Policy ? | HK | CHINA |
| | 1. Quality policy (not written) | — | — |
| | 2. Written quality policy | — | — |
| | 3. No quality policy | — | — |
| 2.. | Who is responsible for setting Quality Policy ? | HK | CHINA |
| | 1. General Manager | — | — |
| | 2. Quality Manager | — | — |
| | 3. Production Manager | — | — |
| | 4. No quality Policy | — | — |
| | 5. Others, _____ | — | — |
| 3. | Which major quality technique is employed by your company ? | HK | CHINA |
| | 1. ISO 9000 series | — | — |
| | 2. Total quality management | — | — |
| | 3. Continuous quality improvement | — | — |
| | 4. Your own quality standard | — | — |
| | 5. No quality system | — | — |
| | 6. Other, _____ | — | — |
| 4. | Quality objectives are set with respect to which one of the following ? | HK | CHINA |
| | 1. Cost | — | — |
| | 2. Product features | — | — |
| | 3. Customer's requirements | — | — |
| | 4. No quality objectives | — | — |
| | 5. Others, _____ | — | — |
| 5. | How quality policy and objectives are communicated in the company ? | HK | CHINA |
| | 1. Quality circles | — | — |
| | 2. Quality meeting | — | — |
| | 3. Quality newsletter | — | — |
| | 4. Company newsletter | — | — |
| | 5. No communication | — | — |
| | 6. Others, _____ | — | — |
| 6. | Who is the key person in maintaining the quality system in your company ? | HK | CHINA |
| | 1. Quality Manager | — | — |
| | 2. Production Manager | — | — |
| | 3. General Manger | — | — |
| | 4. Administration Manager | — | — |
| | 5. No person | — | — |
| | 6. Others, _____ | — | — |

- | | | | |
|-----|---------------------------------------------------------------------------------------------------------------|----|-------|
| 7. | Is inspection perform on incoming materials ? | HK | CHINA |
| | 1. Yes | — | — |
| | 2. No | — | — |
| 8. | Which of the followings are performed in your company to evaluate quality ?
(You can choose more than one) | HK | CHINA |
| | a. Periodic quality audit | — | — |
| | b. Periodic Management Review on Quality | — | — |
| | c. Internal failures recording | — | — |
| | d. Quality performance report at management meeting | — | — |
| | e. Others, _____ | — | — |
| 9. | Which of the following costs of quality are recorded ?
(You can choose more than one) | HK | CHINA |
| | a. Testing | — | — |
| | b. Inspection | — | — |
| | c. Rework | — | — |
| | d. Scrap | — | — |
| | d. Failure prevention | — | — |
| | e. Product failure (Internal) | — | — |
| | f. Product failure (External) | — | — |
| | g. None is recorded | — | — |
| | h. Others, _____ | — | — |
| 10. | Are there any regular supplier quality audits ? | HK | CHINA |
| | 1. Yes | — | — |
| | 2. No | — | — |
| 11. | Is there any vendor performance rating based on the following ?
(You can choose more than one) | HK | CHINA |
| | a. Quality performance | — | — |
| | b. Delivery performance | — | — |
| | c. No vendor rating | — | — |
| | d. Price | — | — |
| | e. Other, _____ | — | — |
| 12. | Is an updated approved vendor list maintained ? | HK | CHINA |
| | 1. Yes | — | — |
| | 2. No | — | — |
| 13. | How do you monitor your product quality after delivery ?
(You can choose more than one) | HK | CHINA |
| | a. Ask for customer feedback | — | — |
| | b. Track warranty costs | — | — |
| | c. Track service costs | — | — |
| | d. Track customer complaints | — | — |
| | e. Third party certification | — | — |
| | f. Other method | — | — |
| | g. Do not measure | — | — |

- | | | | |
|-----|---------------------------------------------------------------------------------------------------|----|-------|
| 14. | Is quality important for low cost manufacturing products ? | HK | CHINA |
| | 1. Yes | — | — |
| | 2. No | — | — |
| 15. | Is there any quality control team in your company? | HK | CHINA |
| | 1. Yes (Go to question no. 16) | — | — |
| | 2. No (Go to question no. 17) | — | — |
| 16. | What is the number of people involved in this control team? | HK | CHINA |
| | 1. below 10 | — | — |
| | 2. between 10 and 30 | — | — |
| | 3. between 30 and 50 | — | — |
| | 4. more than 50 | — | — |
| 17. | Does your company provide training in quality management to your staff ? | HK | CHINA |
| | 1. Yes | — | — |
| | 2. No (Go to question no. 20) | — | — |
| 18. | What levels of employees do your company provide training for ?
(You can choose more than one) | HK | CHINA |
| | a. Management level | — | — |
| | b. Supervision level | — | — |
| | c. Staff level | — | — |
| | d. Operator level | — | — |
| 19. | What types of training has/have provided in your company ?
(You can choose more than one) | HK | CHINA |
| | a. ISO 9000 | — | — |
| | b. Leadership skills | — | — |
| | c. Making decision | — | — |
| | d. Problem solving | — | — |
| | e. Team work | — | — |
| | f. Communications skills | — | — |
| | g. Technical know-how | — | — |
| | h. Others, _____ | — | — |
| 20. | How does your company train workers to have good attitudes towards quality ? | HK | CHINA |
| | 1. To pay more money to train and motivate workers | — | — |
| | 2. To give more benefits for workers | — | — |
| | 3. To provide more training courses about quality for workers | — | — |
| | 4. No training | — | — |
| | 5. Others, _____ | — | — |
| 21. | Are the quality practices transferred from Hong Kong to your CHINA plant ? | | |
| | 1. Yes | | |
| | 2. No | | |

22. What is your role as quality management transfer catalyst for your China's operations ?

1. To train some quality management experts, then transfer them to China
2. To train some managers in China in quality management
3. To send profession people in quality management to China to implement quality management
4. Others : _____

23. How do you rate the quality awareness, attitudes of employees, documentation and QC/QA practice of quality management in your company ? (please circle your response for each item)

	<u>HK</u>						<u>CHINA</u>				
	very poor		fair		very good		very poor		fair		very good
a. Quality Awareness	1	2	3	4	5		1	2	3	4	5
b. Attitudes to quality	1	2	3	4	5		1	2	3	4	5
c. Documentation	1	2	3	4	5		1	2	3	4	5
d. QC/QA practice	1	2	3	4	5		1	2	3	4	5

Section Two : ISO 9000 system practice in your company

24. Is your company ISO 9000 certified?

	HK	CHINA
1. Yes	—	—
2. No	—	—

If the answer is 'YES', please go to questions No. 27

If the answer is 'NO', please answer questions No. 25 and 26 only in this section

25. Will your company apply for ISO 9000 certification?

	HK	CHINA
1. Yes	—	—
2. No	—	—

26. Why does your company not consider ISO 9000 system ?
(You can choose more than one)

	HK	CHINA
a. ISO 9000 system has many limitations	—	—
b. Traditional quality management is used , it is hard to change the system easily.	—	—
c. Complicated ISO 9000 certification process	—	—
d. Others, please specify _____	—	—

27. Why ISO 9000 certification is considered by your company ?
(You can choose more than one)

	HK	CHINA
a. To conform to customer's requirement	—	—
b. To maintain competitiveness	—	—
c. To promoting your company's public image	—	—
d. For better quality of your products or service	—	—
e. Diversifying export	—	—
f. Under the pressure from the European Community	—	—
e. Other, please specify: _____	—	—

28. How many years have been spent by your company in achieving the ISO 9000 registration ?
- | | HK | CHINA |
|-----------------------|----|-------|
| 1. less than one year | — | — |
| 2. 1 – 2 years | — | — |
| 3. 2 – 3 years | — | — |
| 4. 4 years or about | — | — |
29. How much had you spent on achieving the ISO 9000 certificate ?
- | | HK | CHINA |
|-----------------------------|----|-------|
| 1. Below \$300,000 | — | — |
| 2. \$300,000 to \$500,000 | — | — |
| 3. \$500,000 to \$700,000 | — | — |
| 4. \$700,000 to \$900,000 | — | — |
| 5. \$900,000 to \$1,000,000 | — | — |
| 6. More than \$1,000,000 | — | — |
30. Which are the difficulties during and after the ISO 9000 certification process ?
(You can choose more than one)
- | | HK | CHINA |
|-----------------------------------------------------|----|-------|
| a. To judge suitability of ISO 9000 in your company | — | — |
| b. To make sure everyone follows the rules | — | — |
| c. Difficult to document all information | — | — |
| d. Difficult to provide proper staff training | — | — |
| e. Lack of awareness of quality from the staff | — | — |
| f. Lack of support from the top management | — | — |
| g. Poor communication among departments or staff | — | — |
| h. Too much paper work | — | — |
| i. Other, _____ | — | — |
31. What is/are the significant benefit(s) to your company after obtaining ISO 9000 certificate ?
(You can choose more than one)
- | | HK | CHINA |
|---------------------------------------------------------------------------------------------|----|-------|
| a. To improve productivity by reducing rework or scrap | — | — |
| b. To improve delivery by reducing poor quality lot | — | — |
| c. To minimize customers' outgoing product audits or inspection | — | — |
| d. To obtain new or more order by satisfying buyers' requirement for ISO 9000 certification | — | — |
| e. To help to retain in competitive market | — | — |
| f. To improve you company's quality image | — | — |
| g. Other, _____ | — | — |
32. What is/are the significant benefit(s) to the internal operations of your company after obtaining ISO 9000 certificate ? (You can choose more than one)
- | | HK | CHINA |
|-----------------------------------------------------|----|-------|
| a. Clearly defined accountability or responsibility | — | — |
| b. Traceable means to defects | — | — |
| c. Prevent nonconformity in the process | — | — |
| d. Better information flow | — | — |
| e. Better communication | — | — |
| f. Others, _____ | — | — |
33. Does your company implement Continuous Quality Improvement (CQI) system ?
- | | HK | CHINA |
|--------|----|-------|
| 1. Yes | — | — |
| 2. No | — | — |

If the answer is 'YES', what are the benefits from CQI in your company ?
(You can choose more than one)

	HK	CHINA
a. Reduced rejection rate	—	—
b. Reduced number of worker	—	—
c. Increased productivity	—	—
d. Gaining market shares	—	—
e. Reduced customer return	—	—
f. Other : _____	—	—

Section Three : Future development in your company

34. Do you consider ISO 9000 as your company's ultimate quality goal ?

	HK	CHINA
1. Yes	—	—
2. No	—	—

If the answer is 'NO', which of the following will your company achieve as the ultimate quality goal ?

	HK	CHINA
1. No quality system	—	—
2. Continuous Quality Improvement (CQI)	—	—
3. Total Quality Management (TQM)	—	—
4. Your own quality system	—	—
5. Others, please specify _____	—	—

35. What is your future plan for quality improvement beyond ISO 9000 ?
(You can choose more than one)

	HK	CHINA
a. No plan	—	—
b. Reducing product cycle time to market	—	—
c. Increase product variety	—	—
d. Emphasis on concurrent engineering approach	—	—
e. Emphasis on supplier/customer relationship	—	—
f. Extensive use of automation techniques and computer technology	—	—
g. Formal continuous quality improvement programme	—	—
h. Others, please specify: _____	—	—

36. Is quality a road to success in Hong Kong and China Manufacturing ?

	HK	CHINA
1. Yes	—	—
2. No	—	—

End of the questionnaire

Thank you for completing this survey !!

If you want to receive a copy of our summary report, please fill in the following particulars :

Company Name : _____

Address : _____

Tel no. : _____

Contact Person : _____

Background of your company

1. When did your company set up?

- | | |
|--------------------------|--------------------------|
| 1. Before 1975 | 2. Between 1976 and 1980 |
| 3. Between 1981 and 1985 | 4. Between 1986 and 1990 |
| 5. After 1990 | |

2. Which of the followings best describes the business nature of your company?

- | | |
|-----------------------------------|------------------------------------------|
| 1. Electronic | 2. Electrical products |
| 3. Mechanical products | 4. Optical products |
| 5. Toys | 6. Wearing apparel |
| 7. Textiles | 8. Plastics, rubber and leather products |
| 9. Paper and printing | 10. Food and beverage |
| 11. Metal products and machinery | 12. Mold and die |
| 13. Chemicals and pharmaceuticals | 14. Jewelry |
| 15. Others (Please specify) _____ | |

3. What kind(s) of products does your company produce?

- | | |
|----------------------------------|----------------------|
| 1. Clothing | 2. Toys |
| 3. Clocks / Watches | 4. Consumer products |
| 5. Printing material | 6. Processed food |
| 7. Electrical appliance | 8. Jewelry |
| 9. Others (Please specify) _____ | |

4. How many staff are employed in your company in Hong Kong? (please select the appropriate & fill in the number)

Department / Function	HK
a. Production processes	_____
b. R & D	_____
c. Quality assurance	_____
d. Administration	_____
e. Sales & marketing	_____
f. Financial management	_____
g. Others (Please specify _____)	_____

5. Has the production process of your company been moved / started in China?

1. No production processes has been shifted to China. (PLEASE GO TO QUESTION 7)
2. All the production processes have been moved to China.
3. _____ % of the production processes have been moved to China
4. All the production processes have been started in China since your company set up
5. _____ % of production processes have been started in China since your company set up

6. When did your company start to move the production processes to mainland China?

- | | |
|--------------------------|--------------------------|
| 1. Before 1979 | 2. Between 1979 and 1984 |
| 3. Between 1985 and 1989 | 4. Between 1990 and 1992 |
| 5. After 1992 | |

PLEASE GO TO QUESTION 8

7. Why hasn't your company shifted the production process to mainland China? (Please rank the following reasons in order of importance, 1 : the most important)

- a. Lack of political confidence
 - b. Difficult to remote control
 - c. Logistic problem
 - d. Unreliable quality
 - e. Poor labour skill
 - f. Unfamiliar environment
 - g. Difference in culture and custom
 - h. Immature rules and regulations
- Please specify the other reason(s) below:

PLEASE GO TO QUESTION 9.

8. How many staff are employed in your company in China? (please select the appropriate & fill in the number)

Department / Function

China

- a. Production processes
- b. R & D
- c. Quality assurance
- d. Administration
- e. Sales & marketing
- f. Financial management
- g. Others (Please specify _____)

9. What amount of capital has your company invested? (please put a tick in the appropriate blanks)

- 1. Less than HK\$500,000
- 2. \$500,000 - \$1,000,000
- 3. \$1,000,000 - \$5,000,000
- 4. \$5,000,000 - \$10,000,000
- 5. \$10,000,000 - \$15,000,000
- 6. \$15,000,000 - \$20,000,000
- 7. \$20,000,000 or above

a. HK

b. China

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

10. What is the percentage of your company's total output in Hong Kong / China and other countries? (Please circle the appropriate and fill in the blanks)

Percentage of total output

- a. Hong Kong
- b. China
- Other countries, please specify
- c. _____
- d. _____

11. Where is the head office and factory / branch office of your company located? (please circle the appropriate)

Type

Location

- a. Head office
- b. Factory / Branch office

- 1. Hong Kong / 2. China / 3. others (please specify) _____
- 1. Hong Kong / 2. China / 3. others (please specify) _____

New Product Development Strategies for HK Manufacturing Industries

Section One : Proactive approach

1. Is there any Research and Development department in your company?
 1. Yes
 2. No (Go to question 4)

2. Location of the R&D department:
 1. Hong Kong
 2. China
 3. Both of above
 4. Others (Please specify) _____

3. How many people are involved in this department?
 - a. HK _____
 - b. China _____

GO TO QUESTION 6

4. Will your company develop a R&D department in the next few years?
 1. Yes (Go to No. 6)
 2. No
 3. Others (please specify) _____ (Go to No. 6)

5. Why not? *(Please circle the most significant factor)*
 1. Lack of expertise
 2. Too large investment
 3. Too risky
 4. Not required by customers
 5. Lack of government support
 6. Others (Please specify) _____

6. From your experience, what will be the difficulties in establishing Research and Development center in your company in Hong Kong and China(if applicable)? *(Please fill in the most significant factor by number)*
 - a. Hong Kong _____
 - b. China _____
 1. Too large investment
 2. Lack of expertise
 3. Low return
 4. Not necessary for the present market
 5. Lack of government support
 6. Others (Please specify) _____

7. At present, what is the proportion of products made according to buyers' designs?
 1. All (Go to No. 12)
 2. Above 70%
 3. Between 30 to 70%
 4. Below 30%
 5. None, all your products are designed by your own company

8. Where is your product design office located?
 1. Both HK and China (Go to No. 10)
 2. Hong Kong
 3. China (Go to No. 10)
 4. Others (Please specify) _____ (Go to No. 10)

9. Why does your company keep product design work in Hong Kong rather than in China? *(Please circle the most significant factor)*
 1. Plenty of expertise
 2. Better marketing information support
 3. Good implementation of team work approach
 4. Hong Kong's designers are more innovative
 5. Others (Please specify) _____

18. From your experience, do you agree that a good market entry time may not be the first market entrant?
 1. Yes 2. No 3. It depends 4. No idea

19. In your company, is Time-to-Market approach (*∴ minimize elapsed time between product definition and product availability*) applied in new product development?

1. Yes
 2. You realize the benefits of 'TTM' and plan to implement it (Go to No. 21)
 3. No, but you know what 'TTM' is (Go to No. 21)
 4. No, you have never heard the term 'TTM' (Go to No. 21)

20. Technique(s) employed by your company in Hong Kong and China (*if applicable*) to reduce Time-To-Market. (please put a tick in the appropriate blanks)

Techniques for reducing Time-To-Market

a. HK

b. China

Organizational / managerial Approach:

1. Employee Training

2. Matrix Organization

3. Total Quality Management (TQM)

4. Supplier Involvement

Technology / Tools Approach:

5. CAD / CAM and Network

6. Rapid Prototyping

7. Computer-aided Engineering

8. Computer-aided Process Planning

9. Manufacturing Simulation

10. Standard Procedures / Checklists

11. Design for Manufacture & Assembly (DFMA) Software

12. Quality Function Deployment

13. Taguchi Method

14. Failure Mode and Effects Analysis (FMEA)

15. Value Engineering

21. From your experience, what are the difficulties for shortening Time-To-Market (*elapsed time between product definition and product availability*) in new product development? (*Please circle the most significant factor*)

1. Too large investment

2. Lack of expertise

3. Low return

4. Lack of team work approach

5. Difficult to provide proper training

6. Lack of Time-To-Market awareness

7. Lack of support from top management

8. Lack of coordination among departments and staff

9. Others (Please specify) _____

22. Is the concept of concurrent engineering (*so the three stages: concept generation, product engineering, and process engineering are developed concurrently in an iterative fashion that allows for continuous exchange of ideas and timely feedback of implications*) applied in your company's new product development?

1. Yes

2. No

23. Is there any multi-disciplinary project team in your company?

1. Yes

2. No (Go to No. 25)

24. What are the main functions of the team? (You can circle more than one.)

- a. Reduce Time-To-Market
- b. Review the development process periodically
- c. Others (Please specify) _____

GO TO QUESTION 26

25. Why not? (You can circle more than one.)

- a. Staff accustomed to other development processes
- b. Difficult for management control
- c. Lack of cross-functional culture
- d. Others (Please specify) _____

Section Three : Quality approach

26. From your experience, what are the difficulties for employing a good quality system in new product development of your company in HK and China(if applicable)? (Please fill in the most significant factor)

a. Hong Kong _____ b. China _____

- | | |
|----------------------------------------------------|----------------------------------------|
| 1. Too large investment | 2. Lack of expertise |
| 3. Lack of team work approach | 4. Bad attitude of labors |
| 5. Difficult to provide proper staff training | 6. Lack of quality awareness |
| 7. Difficult to choose proper control technique(s) | 8. Lack of support from top management |
| 9. Poor communication among departments or staff | |
| 10. Others (Please specify) _____ | |

27. By employing a good quality system, how do you feel about the reduction in the 'cost' in new product development?

No effect		Moderate		Great
		Reduction		Reduction
1	2	3	4	5

28. From your experience, with strong support of R&D and quality, what will be the degree of reduction in Time-To-Market?

No				Great
Reduction		Moderate		Reduction
1	2	3	4	5

29. Which one of the followings is your company's superior image in the market?
(Please circle the most significant factor)

- | | |
|-------------------------|----------------------------------|
| 1. Low price | 2. Good quality |
| 3. Excellent technology | 4. Others (Please specify) _____ |

30. In your opinion, which one of the followings is your company's weak point as the competitive strength?
(Please circle the most significant factor)

- | | | |
|----------------------------|-------------------|----------------------------------|
| 1. Quality | 2. Technology | |
| 3. Customer responsiveness | 4. Time-to-market | 5. Others (Please specify) _____ |

Section Four : High technology

31. To what extent has your company got support in new technology and R&D from the Hong Kong government?

None		Moderate		Plenty
1	2	3	4	5

If the answer is 'NONE', please go to question 33.

32. What kind of support has your company got from the government?

1. Financial support
2. Technical information
3. Others (Please specify) _____

33. To what extent has your company gained technical support from the universities in Hong Kong?

None		Moderate		Plenty
1	2	3	4	5

34. What kinds of support has your company got from China to assist new product development?
(You can circle more than one)

- a. None
- b. Your company has engaged experts from China
- c. There is connection between the Chinese universities and your company
- d. Your company can get the research results from the governmental R&D center in China
- e. Obtaining technology information through business communication with the Chinese companies
- f. Others (Please specify) _____

35. Has your company provided financial support to any R&D project in China?

1. Yes
2. No

36. Are there any long-term strategies and investments in new technology and R&D?

1. Yes
2. No (Go to No. 38)

37. What is the ratio of these investments to the total expenditure of your company in the next few years?

1. Below 30 %
2. Between 30 to 70 %
3. Above 70 %

Section Five : China Situation

38. In the future, will the new product development of your company remain in Hong Kong or will it be shifted to China gradually?

1. Remain in Hong Kong
2. Shift to China
3. Develop in both HK and China
4. Others _____

If your company does not possess any plants in China, you may stop here.

39. Role(s) of your production plants in China. (You can circle more than one.)

- | | |
|----------------------------------|-----------------------------|
| a. Production | b. Research and Development |
| c. Purchasing | d. Quality assurance |
| e. Others (Please specify) _____ | |

40. Role(s) of your company in Hong Kong in assisting the plants in China. (You can circle more than one.)

- | | |
|------------------------------------|------------------------------------------------------|
| a. Receive orders from the buyers | b. Bridge between the buyers and the plants in China |
| c. Purchasing | d. Quality assurance |
| e. Research and Development center | f. Market research center |
| g. Others (Please specify) _____ | |

41. Please comment on the time taken for the followings between your plants in Hong Kong and China.

	Short Time		Quite Long		Very Long
Communication	1	2	3	4	5
Transportation of raw materials, products, etc	1	2	3	4	5
Production time in China compared with Hong Kong	1	2	3	4	5

42. How do your plants in China acquire technology? (You can circle more than one)

- a. From your Hong Kong's company
- b. Internal R&D
- c. Universities or Polytechnics in China
- d. Chinese government help
- e. Others (Please specify) _____

43. In China, what are the difficulties in acquisition, management and exploitation of technology?
(You can circle more than one)

- a. Not enough R&D funding
- b. Discouragement from top executives
- c. No experienced technological professionals
- d. Political issues
- e. Others (Please specify) _____

End of the questionnaire

Thank you for completing this survey !!

If you want to receive a copy of our summary report, please fill in the following particulars :

Company Name : _____

Address : _____

Tel no. : _____

Contact Person : _____

City University of Hong Kong
Department of Manufacturing Engineering

This questionnaire aims at offering an opportunity for Hong Kong manufacturers to express their views and ideas for the following :

- (1) Strategic development of Hong Kong manufacturing industries.
- (2) Impact of transportation system in China to Hong Kong manufacturing industries.

Please answer all questions. Thanks.

SECTION I : STRUCTURE AND BUSINESS NATURE OF YOUR COMPANY

1. When did your company set up? (please circle one)
 1. Before 1975
 2. Between 1976 and 1980
 3. Between 1981 and 1985
 4. Between 1986 and 1990
 5. After 1990
2. Which of the following best describes the business nature of your company? (please circle one)
 1. Electronic
 2. Electrical products
 3. Mechanical products
 4. Optical products
 5. Toys
 6. Wearing Apparel
 7. Textiles
 8. Plastics, rubber and leather products
 9. Paper and printing
 10. Food and beverage
 11. Metal products and machineries
 12. Mould and die
 13. Chemicals and pharmaceuticals
 14. Jewellery
 15. Others (please specify: _____)
3. What kind(s) of products does your company produce? (please circle one)
 1. Clothing
 2. Toys
 3. Clocks / watches
 4. Consumer products
 5. Printing material
 6. Processed food
 7. Electrical appliance
 8. Jewellery
 9. Others. (Please specify _____)
4. In Hong Kong, how many staff are employed in your company? (please select the appropriate departments and fill in the number)

	<u>Department / Function</u>	<u>Number of employees</u>
a.	Production processes	_____
b.	R & D	_____
c.	Quality assurance	_____
d.	Administration	_____
e.	Sales & marketing	_____
f.	Financial management	_____
g.	Others. (please specify _____)	_____

5. Has the production process of your company been shifted to China ?
(please circle the most appropriate answer and fill in the blank if applicable)

1. No production process has been shifted to China. (PLEASE GO TO QUESTION 7)
2. All the production processes have been moved to China.
3. _____ % of the production processes have been moved to China.
4. All the production processes have been started in China since the company set up.
5. _____ % of the production processes have been started in China since the company set up.

6. When did your company start to move the production processes to mainland China? (please circle one)

1. Before 1979
2. Between 1979 and 1984
3. Between 1985 and 1989
4. Between 1990 and 1992
5. After 1992

PLEASE GO TO QUESTION 8.

7. Why hasn't your company shifted the production process to mainland China?
(Please rank the following reasons in order of importance, 1 : the most important)

- | | | |
|----|----------------------------------|--|
| a. | Lack of political confidence | |
| b. | Difficult to control remotely | |
| c. | Logistic problem | |
| d. | Unreliable quality | |
| e. | Poor labour skill | |
| f. | Unfamiliar environment | |
| g. | Difference in culture and custom | |
| h. | Immature rules and regulations | |

Please specify other reason(s) below:

YOU MAY SKIP ALL OTHER QUESTIONS. THANK YOU.

8. In China, how many staff are employed in your company? (please select the appropriate departments and fill in the number)

	<u>Department / Function</u>	<u>Number of employees</u>
a.	Production processes	_____
b.	R & D	_____
c.	Quality assurance	_____
d.	Administration	_____
e.	Sales & marketing	_____
f.	Financial management	_____
g.	Others. (please specify _____)	_____

9. How much capital has your company invested? (please put a tick in the appropriate blank)

	a. H.K.	b. China
1. Less than HK\$500,000	_____	_____
2. HK\$500,000 - HK\$1,000,000	_____	_____
3. HK\$1,000,000 - HK\$5,000,000	_____	_____
4. HK\$5,000,000 - HK\$10,000,000	_____	_____
5. HK\$10,000,000 - HK\$15,000,000	_____	_____
6. HK\$15,000,000 - HK\$20,000,000	_____	_____
7. HK\$20,000,000 or above	_____	_____

10. What is the percentage of your company's total output in Hong Kong, China and other countries?

	Percentage of total output
a. Hong Kong	_____
b. China	_____
Other countries. Please specify	_____
c. _____	_____
d. _____	_____

SECTION II : HONG KONG BASE AS A MANUFACTURING SUPPORT CENTRE

11. What are the problems of maintaining the production processes in Hong Kong?
(Please rank the following in order of importance, 1 : the most important)

a. Escalating land and rental costs	_____
b. Shortage of labour	_____
c. Increasing wages and other production costs	_____
d. Poor quality of labour	_____
e. Others. (Please specify _____)	_____

12. How often do your company's staff in Hong Kong required to travel and work in China? (please circle the appropriates)

		<u>Number of days per week</u>			
a.	Production processes	1	2	3 or more	permanent stay in China
b.	Material handling	1	2	3 or more	permanent stay in China
c.	Quality control	1	2	3 or more	permanent stay in China
d.	Delivery of goods	1	2	3 or more	permanent stay in China
e.	Others. (please specify _____)	1	2	3 or more	permanent stay in China
f.	Others. (please specify _____)	1	2	3 or more	permanent stay in China

13. Are your company's staff in Hong Kong willing to travel to China? (please circle one)

1	2	3	4	5
NOT WILLING	_____	_____	_____	VERY WILLING

14. Do your staff in Hong Kong need additional training in order to coordinate with the shift of production base to China?
(please circle one)

1. Yes
2. No

15. After your company moved the production processes to China, what have been the roles of your Hong Kong office?
(You may circle more than one)

- a. Promotion of your company's products
- b. Commercial connection with China and western countries
- c. Product design / technology transfer centre
- d. Financial advice and management know how transfer for China
- e. Others. (Please specify _____)

16. In order to become a support centre for Hong Kong based manufacturing in China, what should be improved and developed in Hong Kong ? (Please rank the followings in order of importance, 1 : the most important)

- a. Quality management
- b. Product development
- c. Research and development in production
- d. Communication with China
- e. Commercial connection with western countries
- f. Logistic support
- g. Sales and marketing
- h. Others. (Please specify _____)

17. What does your company provide for the factories in China? (You may circle more than one)

- a. Foreign investment
- b. Raw material and parts
- c. Machinery
- d. Modern production technology
- e. Management expertise
- f. Marketing know-how
- g. Others. (Please specify _____)

SECTION III : CHINA BASE AS A PRODUCTION CENTRE

18. Where does / do your company's production plant(s) situated in mainland China? (please circle the appropriates)

- 1. Pearl River Delta
- 2. Yangtze zone
- 3. Pudong area
- 4. Others. (Please specify _____)

19. What major benefit does your company gain by moving your production processes to mainland China? (Please circle one)

- 1. Abandon supply of cheap labour
- 2. Cheap land and building
- 3. R & D support from China
- 4. Good quality product
- 5. Tax incentive
- 6. Low production cost
- 7. Others. (Please specify _____)

20. What major problem does your company find from moving / starting your production processes in mainland China?
(Please circle one)

1. Unstable political environment
2. Inconsistent Government's economic reform policy
3. Immature legal and regulatory system
(e.g. accounting system, foreign exchange control, confused legislation and regulation, etc.)
4. Lack of logistic support
5. Poor infrastructure (e.g. inadequate power supply)
6. Poor labour quality
7. Management problem
8. Others. (Please specify _____)

21. How do you find the support from Chinese Government? (please circle one)

1. Very poor
2. Poor
3. Fair
4. Good
5. Very good

22. Are your company's products manufactured in China for export or domestic consumption in China?
(please circle the appropriate and fill in the blanks)

1. 100 % export
2. 100 % domestic consumption
3. _____ % export and _____ % domestic consumption

SECTION IV: TRANSPORTATION LINKAGE BETWEEN HONG KONG & CHINA

23. How many factories have your company established in China & where are they located? (please circle the appropriate & fill in the no. of factories, write the name of the city in option l if the choices are not appropriate.)

	<u>Location</u>	<u>No. of factories</u>
a.	Shenzhen	_____
b.	Dongguan	_____
c.	Huizhou	_____
d.	Guangzhou	_____
e.	Foshan	_____
f.	Panyu	_____
g.	Nanhai	_____
h.	Shantou	_____
i.	Zhongshan	_____
j.	Shanghai	_____
k.	Beijing	_____
l.	Others (please specify: _____)	_____

24. Which of the following items are transported into & out of your factories in China? (you may circle more than one for each)

	<u>Direction</u>	<u>Item</u>		
a.	Into China	(a) Raw material	(b) Semi-finished product	(c) Finished product
b.	Out of China	(a) Raw material	(b) Semi-finished product	(c) Finished product

25. There are two possible routes for the transportation of the above items.
- China indirectly to overseas with Hong Kong as an entrepot, or China to Hong Kong as a final destination.
 - China directly to overseas.

By what transport modes does your company use in these two routes?

		Transport Route		Subtotal (a)+(b)
		i) China↔H.K.↔overseas or China↔H.K. (a)	ii) China↔overseas (b)	
Transport Mode	Road	%	N.A.	%
	Rail	%	N.A.	%
	Sea	%	%	%
	River	%	N.A.	%
	Air	%	%	%

N.A.: Not applicable

Total amount of goods shipped: 100%

26. From your company's past experience, how do you comment the performance of the following two transport routes?

Aspect	i) China↔H.K.↔overseas or China↔H.K.					ii) China↔overseas				
	Very good					Very poor				
a. Route reliability	1	2	3	4	5	1	2	3	4	5
b. Adequacy of transport facilities	1	2	3	4	5	1	2	3	4	5
c. Efficiency of transport facilities	1	2	3	4	5	1	2	3	4	5
d. Time control & management	1	2	3	4	5	1	2	3	4	5
e. Consolidated operation procedures	1	2	3	4	5	1	2	3	4	5
f. Prevention of corruption problem	1	2	3	4	5	1	2	3	4	5
g. Cargo damage & loss warranty	1	2	3	4	5	1	2	3	4	5
h. Others (please specify: _____)	1	2	3	4	5	1	2	3	4	5

27. Has your company faced the following problems in cargo transit by road? (please circle your response)

Problem	Response				
a. Traffic congestion in roads	Yes/	No/	No	idea	
b. Blockage at border crossings	Yes/	No/	No	idea	
c. Corruption at border crossings	Yes/	No/	No	idea	
d. Cargo damage due to poor quality roads	Yes/	No/	No	idea	
e. Time delay & backlogs	Yes/	No/	No	idea	
f. Primitive roads, not suitable for vehicle	Yes/	No/	No	idea	
g. Others (please specify: _____)	Yes/	No/	No	idea	

28. Do Guangzhou-Shenzhen-Zhuhai Expressway & the practice of 24 hours border's service have improvement on your company's operation? (please circle your response)

New Arrangement	No improvement			Significant improvement	
a. Guangzhou-Shenzhen-Zhuhai Expressway	1	2	3	4	5
b. Practice of 24 hours border's service	1	2	3	4	5

29. According to your company's experiences, what is the time delay for cargo shipment from China to Hong Kong on average? (please tick the appropriate delay category)

Transport Mode	N / A	No delay	Delays less than a week	Delays 1 - 2 weeks	Delays more than 2 weeks
Road					
Rail					
Sea					
River					
Air					

N / A : Not applicable

30. How frequent does your company transport the cargo by air? (please circle one)

- Often
- Sometimes
- Seldom
- Never (please go to question 34)

31. Has your company had the experience of transporting cargo by air through Shenzhen International Airport?
(please circle the appropriate)

1. Yes
2. No

32. What are your experiences with the services provided by Shenzhen International Airport?

Statement		Very poor			Excellent	
		1	2	3	4	5
a.	Poor ground services and control systems	1	2	3	4	5
b.	Freight schedules	1	2	3	4	5
c.	Local transport to the surrounding industrial areas	1	2	3	4	5
d.	Cargo loss and damage warranty	1	2	3	4	5
e.	Others. (Please specify _____)	1	2	3	4	5

33. What is your overall impression on the existing Transportation System in China to match up with the demand of your company's operation? (please circle the appropriate)

1. Very good
2. Good
3. Adequate
4. Poor
5. Very poor

SECTION V: FUTURE DEVELOPMENT OF YOUR COMPANY

34. What is the future development plan of your company? (please put a tick / ticks as appropriate)

		Short term 1 - 2 years	Medium term 3 - 5 years	Long term Over 5 years
a.	Maintain manufacturing activities at PRD	_____	_____	_____
b.	Gradually shift manufacturing to Inland China	_____	_____	_____
c.	Emphasis on quality management	_____	_____	_____
d.	Increase investment in R & D	_____	_____	_____
e.	Increase investment in new product development	_____	_____	_____
f.	Explore domestic market	_____	_____	_____
g.	Expand export market	_____	_____	_____
h.	No change	_____	_____	_____
i.	Scale down investment in China	_____	_____	_____
j.	Remove operations from China	_____	_____	_____
k.	Set up plants in other countries.	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
l.	Other plans.	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

35. What are the favourable factors found in China that have contributed to your future plan mentioned in question 34?
(Please rank the followings in order of importance, 1 : the most important)

a.	Abandon supply of cheap labour	_____
b.	Cheap land and building	_____
c.	R & D support from China	_____
d.	Good quality product	_____
e.	Low production costs	_____
f.	Favourable government policy	_____
g.	A large market existed in China	_____
h.	Others. Please specify _____	_____
	_____	_____
	_____	_____

36. What are the unfavourable factors found in China that have contributed to your future plan mentioned in question 34?
(Please rank the followings in order of importance, 1 : the most important)

- a. Unstable political environment
- b. Inconsistent government's economic reform policy
- c. Immature legal and regulatory system
- d. Lack of logistic support
- e. Poor infrastructure
- f. Poor labour quality
- g. Management problem
- h. Too far away from Hong Kong
- i. Trade barrier from other countries to China
- j. Others. Please specify

37. Is your company's operation heavily threatened by the logistic transportation development in China? (please circle one)

- 1. Definitely yes
- 2. Yes
- 3. Probably yes
- 4. Not at all
- 5. No idea

If you want to receive a copy of our summary report, please fill in the following particulars:

COMPANY NAME: _____

ADDRESS: _____

TELEPHONE: _____

CONTACT PERSON: _____

END OF QUESTIONNAIRE