

Chapter Five

The Case of Little Swan Company

This chapter will firstly outline the company's background, parent company. Aspects regarding the process of technology transfer in each of the case will then be discussed. The approach used in this study is to examine the technical involvement and technology transfer's aspects in the case.

5.1 Situation of Little Swan Group

Wuxi Little Swan Group Limited is in the top 10 of the China largest companies, it has 2 main subsidiaries, 8 Joint-ventures Companies in the worldwide, 14 Share-holding Companies, 3 Sino-Foreign Joint Ventures Companies and 7 oversea branches. Especially company in Malaysia is very active, so I choose Little Swan Southeast Asia Sdn. Bhd. as example of this case study.

5.1.1 Company Background

Little Swan Southeast Asia Sdn. Bhd. (LSSA) is electrical and electronics company, which was established in Kuala Lumpur of Malaysia on December 17th, 1999, the plant covering up to 288 hectare of land with an initial paid – up capital amounting to RM 12.83 million. It is a wholly owned subsidiary by the China parent company. The plant essentially acts as an oversea subsidiary for a Chinese well know MNC. A leading manufacturer of refrigerator, washer, dishwasher, air-conditioner, freezer, induction cooker, dryer, water heater, microwave

oven, industrial washer, industrial dry washer, industrial dryer, ironing, ironing equipment and etc.

The first plant to be established in Malaysia was one of the steps taken by this company of China in its globalization strategies. As a result of over capacity experienced by the Chinese MNC's other subsidiaries in the other countries, like Japan, Germany, Thailand, Taiwan, Hongkong and American. It plays a complementary more labour intensive works formerly done by the parent company. The parent company which has its own R&D unit will support this plant by providing initial back up service and transferring the latest technology development by the R&D unit. Currently the company has established good relationship with many established companies in Malaysia, MEC, ECE, KHIND, FABER, HESSTAR, etc, exploiting OEM (Original Equipment Manufacturer) business. Other than Malaysia's market, the company is putting efforts in exploiting markets in ASEAN (South East Asia) countries, e.g., Thailand, Singapore, and Brunei etc.

This company commenced its operation as a manufacturer of automotive air conditioning compressors, washer, dishwasher and some of the components. Thirty-five per cent of the products were exported to the Hongkong, Thailand and other sister companies. The rest of the products mainly serve the domestic market. The company currently supplies air-conditioning systems, industrial washer, industrial dry washer and ironing equipment to local market.

The Chinese MNC president and chief Executive said Malaysia is a "top priority" country for

the company. An additional RM 15 million has been invested to increase the factory's automation in order to ensure the highest quality products. The company has great confidence in increasing its investments in Malaysia due to the technical and economic strength of the country. The combined productions of both operations are expected to contribute significantly to the group's production for auto and visual products. This is because both are strategically located in countries with good infrastructure amenity, plus abundant suppliers of its components, which would make the plan variable.

Among the factors that influenced the location of this Chinese subsidiary in Malaysia was the surplus labour available with low wage rate, favorable industrial climate in terms of good infrastructure with potential for further improvement, political stability and government tax incentive. Since the products are for the export market, the company benefits from the investment incentives allow it to obtain a competitive price in the world market,

The manager of LSSA reported the ranking of economic stability, as the highest priority can be associated with the Malaysian economy, which had been enjoying relatively stable growth, low rates of inflation and low unemployment, rates. Availability of physical infrastructure such as road, transportation communication system and power supply played the next important role in attraction FDI. The political climate in Malaysia had been relatively stable and in control which assisted in the inflow of FDI.

The early of 2001, Hock Sin Leong Group Bhd (HSLG) which is a leading electrical and

electronics retails has signed a memorandum of understanding on a joint-venture with LSSA in Malaysia.

Under the agreement, HSLG will assemble original equipment manufacturer (OEM) electrical and electronic appliances for company A locally. The HSLG is targeting an initial turnover of \$1.32 million from this arrangement. In addition, HSLG will supply company A with audio-video equipment valued at \$0.53 million in the first year.

LSSA acts as the technical product-assembly consultant and adviser to their company and support the group in R&D, and Quality Control (QC) of local components of the products assembled. Moreover, the deal is expected to reduce the cost of manufacturing and increase HSLG's range of consumer electrical and electronic products. Besides improving its over competitiveness.

5.1.2 Parent Company

Wuxi Little Swan Group Company (WLSG) Limited is one of the largest 100 groups in China, which was established at 1993, its products includes domestic and commercial appliances, such as washing machine, dishwasher, refrigerator, freezer, fabrics drier, industrial washing machine and dry-cleaning machine. Wuxi Little Swan Company Limited, the core of this group, is at present the largest listed company in China to mainly produce washing machine. By the end of October 1999, total assets of our company had reached 2.8 billion-yuan and its net asset had reached 2 billion-yuan. There are 1419 staff members,

including the technical staff of 293. The company's Technology Department has become a national center of technology, having nine working stations.

The domestic market share of Little Swan fully automatic washing machine has been kept at the first place in China for several years. In 1998, the total volume of sales, total income of sales and total profit was at first place in China.

Little Swan products have been exported to more than 60 countries. From Jan. to Oct. of last year, the exporting volume has reached US\$ 20 million.

These years Little Swan has made great efforts on fostering market overseas. Large India market is featured high tariff. Little Swan exports parts to India, seeking for partners to develop India market. This year more than 5000 washers were exported to India. Little Swan is also trying to enter Middle East market. Little Swan pays attention to fostering clients overseas. Through cooperation with Japanese companies, Little Swan tries to export washers to Japan. Little Swan has worked with Iranian companies on setting up washer factory to increase the export of fittings for full-auto washer. Cooperation between Little Swan and US companies increases the export of washer and fittings. Little Swan strengthens and develops relationship with Mexico. In the following 3 years 265,000 washers will be exported to Mexico. Little Swan works on fostering diverse markets.

Little Swan has made great achievements on setting up factories overseas. In addition to ones

in Indonesia and Malaysia, another two are respectively set up in Argentina and South Africa.

Little Swan takes advantage of its advanced technologies and equipment to establish its own international market and widen the exporting profit margin. Last year 25,000 washers are exported to Indonesia and Malaysia. Little Swan is approaching the globalization goal.

In 1995, Little Swan passed ISO9001 International Quality Authentication System. In 1998, the 15 varieties of fully automatic washing machines passed the International Safety Authentication of CE (European Authentication System) and GS (German Authentication System). In 1999, the company passed ISO 14000 Environmental Management Authentication System. It marks that Little Swan has obtained the pass for breaking into the international market.

Nowadays, Little Swan is negotiating separately with world-famous transnational groups such as German Bosch-Siemens Co., Japanese Matsushita Co., Italian Merloni Co., Swiss Schulthess Co. Japanese Fuji Motors and American Whirlpool Co. for joint venture and joint production & development of new-generation domestic and commercial appliances, so as to enhance the quality of life in China's home and to make our whole-hearted contributions.

The parent company is to develop full-range of white goods while emphasizing on washing products. The Little Swan has formulated the new objective for the new century to realize the sales revenue of RMB¹ 20 Billion with the profit of RMB 1 Billion through exports by the

¹ RMB: Ren Ming Bi (China's Currency)

year 2005. They are planing to implement the full-scale innovation in the areas of marketing, technology, management and mechanism. To establish the four pillar industries if washing machines, air-conditioners, refrigerators and dishwashers promote the globalize procurement with the aim to embarking on complete internationalized operations, to maintain the sustainable development and to become the largest white-house electrical appliances manufacturing group in China.

For the talent, the Chinese word "Enterprise" consists have "talent" and "stop" in structure. It means the enterprise will stop operation without talent. With emphasis on the operational and managerial concept of "Employees Being the Essence", the Little Swan has made outstanding achievements in the recruitment and training of talents. The large numbers of employees with Doctorate, Master and Bachelor degrees have formed a managerial and technical team featuring high-capability and high academic credentials. The structure of human resources is becoming more and more rational and comprehensive strength in human resources more and more visible.

For the technical innovations, the Little Swan has defined its technical development strategy as "One Core, Six Supports and Two Guarantees". That is, with the China technical centers as the core and testing centers, the Little Swan (U.S.) Co., the Little Swan (Japan) Co., the Little Swan (Germany) Co. and the Research Institute of Southeast University as the supports and the technical alliance. NEC, MOTOROLA, P&G as the guarantees which the core technologies, correlative technologies and future technologies will be treated differently, so as

to establish powerful technical advantages.

Table 5.1: Wu Xi Little Swan Company Co., Ltd

Subsidiaries	Wuxi Little Swan Sales Co., Ltd.		
	Wuxi Little Swan Imp. & Exp. Company		
Joint-ventures	Wuxi Little Swan-Merloni Dish-washer Co., Ltd.	Partners	Italy
	Wuxi Little Swan-Schulthess Washing Equipment Co., Ltd.		Switzerland
	Wuxi Little Swan-Fuji Cleaning Equipment Co., Ltd.		Japan
	Wuxi Little Swan-Huayin Electric Appliance Co., Ltd.		Taiwan
	Wuxi ASP Electronic Co., Ltd.		Thailand
	Wuxi Little Swan Precision Casting Co., Ltd.		Japan
	Wuxi Lifanda Electric Appliance. Co., Ltd.		Japan
	Wuxi KC Plastic Product Co., Ltd.		America
	Wuxi Little Swan Cooling Electric Appliance Co., Ltd.		
Share-holding Companies	Wuxi Little Swan Mould Manufacturing Co., Ltd.		
	Wuxi Sanjiang Electric Appliance Co., Ltd. (Jingjiang, Jiangsu)		
	Changchun Little Swan-JU Instrument Co., Ltd. (Jilin University)		
	Wuxi Little Swan-SEU engineering research institute (South-east University)		
	WuXi Little Swan SEU Project Research Institute (South-east University)		
	Changchun Jida Little Swan Apparatus Co.,Ltd (Jilin University)		
	Wuxi Little Swan Pottery Co., Ltd.		
	Wuxi Little Swan Tianai Trading Company		
	Wuxi Little Swan Transportation Company		
	Wuxi Little Swan Hubin Laundry		
	Wuxi Little Swan Real Estate Company		
	Wuxi Little Swan Advertising Company		
	Wuxi Little Swan Catering Company		
	BSW Household Appliance Co., Ltd.	Partners	Germany
Sino-Foreign Joint Ventures	Wuxi Matsuchita Compressor Co., Ltd.		Japan
	Wuxi Matsuchita Refrigerator Co., Ltd.		Japan
	Little Swan Southeast Asia Co., Ltd.	Company Location	Malaysia
Overseas Branches	Little Swan Mitachi Marketing Co., Ltd.		Malaysia
	Little Swan (Indonesia) Co., Ltd.		
	Little Swan (Hongkong) Trading Company		
	Little Swan (America) Company		
	Little Swan (Japan) Company		
	Little Swan European Trading Company		German
	Argentina Ahua Household Appliance Company		

In the initial stage of implementation, the China advisory group (expatriate engineers) also prepared a detailed list of the production facilities to be installed in the plant. A major portion of the machinery in the plant was brought from China, only a few items of plant and equipment were purchased in Malaysia.

The parent company provided all the necessary technical know how to LSSA, including documentation, training and technical assistance. Generally, technology was transferred through importations of capital equipments and acquisitions of technical know how from parent company. This company signed a Technical Assistance Agreement (TTA) with its parent company in China. It has to pay a four per cent royalty fee for license and technical assistance provided. Apart from these, the TTA specified the technical documentation and supports to be provided by parent company in China. According to the agreement, staff would be attached to the parent company for on-the-job training (OJT). Training and expatriates would be dispatched to Malaysia to assist in the plant installation and other operating process.

Little Swan Huayin Electric Appliance Co., Ltd. (one of joint-ventures companies of Wu Xi Little Swan Co., Ltd.) has achieved a lot during the past four years since its establishment. Its sales volume has increased from 200 thousand units, 700 thousand units, 1.2m units and then 1.8m units. The sales volume goal for this year is 3.82 units. Over the past three years, we have expanded our product scope to cover washing machine motor, air conditioner motor, dishwasher motor, induction heater and low voltage electrical products. At the same time, we

are also developing overseas market. In 2001, Little Swan Huayin was awarded “Best Supplier for Little Swan Washing Machine”.

Figure 5.1: Sales Revenue from 1998 to 2001 (RMB: 10000)

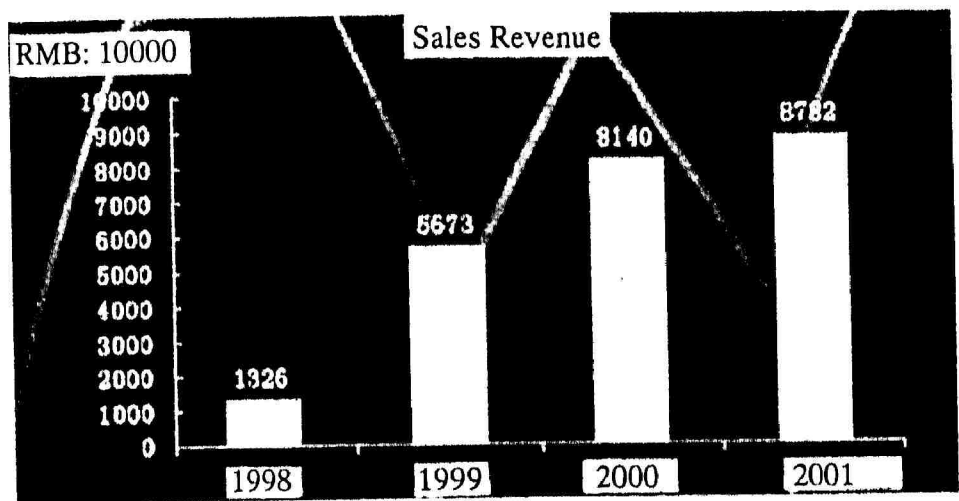


Figure 5.2: Value of Output from 1998 to 2001 (RMB: 10000)

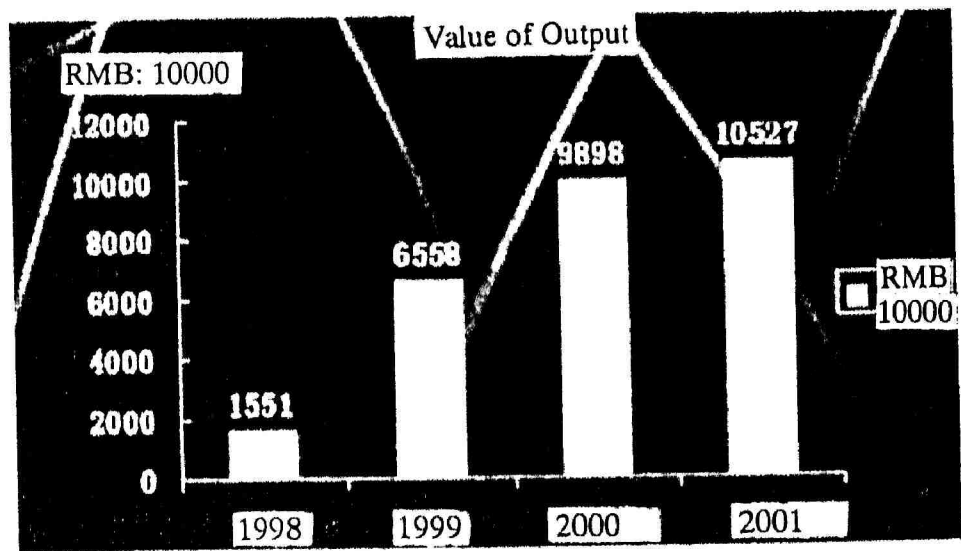
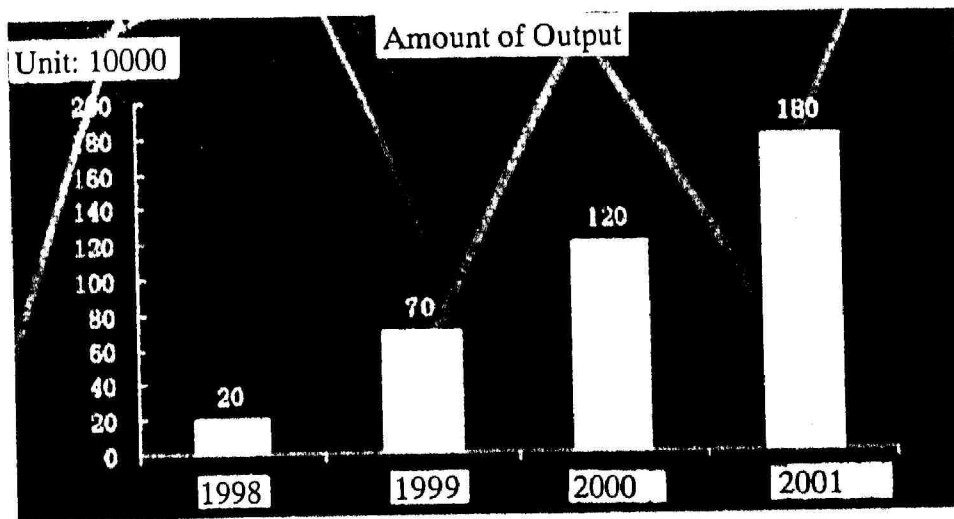


Figure 5.3: Amount of Output from 1998 to 2001 (Unit: 10000)



5.1.3 The Usage of Chinese Expatriates

In the earlier stage, four Chinese expatriates were assigned to LSSA to assist the plant set up for a period of two year. They were one production Manager, one Quality Assurance Manager, one engineering and plant Manager and one line specialist engineer on a two-year assignment's basis. Providing direct on-the-job training to local personnel on how to assemble automotive compressors for completely knocked down component parts to final products and advising on problems that occurred in the mass production stage.

The expatriate Production Manager was assigned here to help and assist in setting up the production line while the expatriate Quality Assurance Manager trained the local engineer in checking and testing both components and final products to meet certain specification.

One of the most important means of transferring technology is through the transfer of expert personnel who are familiar with knowledge of the implementation of certain specific technologies. Technology would transfer to local assistant managers in each of these departments through learning by doing effect.

Presently, only the operation, maintenance and repair functions are handled by local managers or engineers according to local solutions. The alignment of production line was defined by Chinese engineers and the local engineer will make some of the modification based on local conditions.

There were also some Chinese expatriates being sent to company A from Chinese parent company for a period of one or two weeks to assist in setting up the assembly lines when new models were launched in the plant.

5.1.4 The Training of Local Personnel (Training Department)

In the LSSA's technology transfer process, one of the most important transfer techniques used is the provision of training to the host country nationals. This is because the technology transferred by China parent company to LSSA was largely on know-how or modernization experience and skill associated with standardized production techniques. This type of technology cannot be easily embodied in capital equipment, blueprints, or instruction sheets but is mostly embodied in labour at all level of operation. Under these circumstances technical assistance and training must be provided. On the site of actual operations until

transferees acquire the necessary skill through experience. In addition, a major portion of the assembly work was still being carried out manually in this labour local personnel has become one of the major mechanisms used in transferring know how technology.

The training department played a crucial role in the transferring of know how technology to local personnel. It developed a comprehensive Master Training Plan. This included the supervisory, productivity, quality management administrative, technical, computer, general and other education training for the relevant personnel. In LSSA, every employee would have an Employee Training Record and a fixed schedule for adequate training, enabling him or her to upgrade them overtimes.

In general, the training given emphasized two areas:

1. Product related technology – how to manufacture new products (patented technology):
2. Utilization of operation facility and system – how to use certain machinery.

The above mentioned areas of training provided by Chinese parent company were basically towards operation and technical training.

In training of local personnel, which is an essential technique used for transferring technology in this case study, the company has introduced a system of qualification testing and held regular monthly meeting for all engineers where the latest achievements in certain expect are make known.

The managers mentioned that the establishment of the comprehensive training programs was to ensure a well-trained work labour force for a more technology transfer that suit their company is philosophy in which the employees should always be highly skilled and well trained.

5.1.5 New Model and Technology Transfer

This plant does not have its own R&D department, it depended fully on its parent company and sister plants for R&D facilities. Technology documentation such as engineering drawing for new models were provided by the Design Group from R&D China.

In China, when new equipment were needed for new products development, the Chinese parent company would get equipment designers from China to design the equipment according to their requirements. Once the equipment were ready, Chinese parent company would use the equipment for some “sample run” in order to evaluate the engineering drawing and operation manuals would be developed. When the engineering drawing and operation manuals were completed plant. The “sample run” served two objectives:

1. To further evaluate the products after all the modifications had been done;
2. To access the production capacities and find out whether the machines could reach the requirement of the products.

In order to see whether the facilities were sufficient to run the product, the products would

then be sent to Quality Assurance department for further evaluation although the engineering drawings and operation manuals were comparable to those used in China. The texts were not geared to the local standards and therefore these evaluations would further reveal latent problems of products and modifications could be carried out before mass production was permitted.

When Chinese parent company decided to transfer a new model, the headquarters will send short term advisory to Malaysia to assist in planning of the assemble line, testing, calibrating and inspections. Thus, the Advisory Program plays a very important role in transferring know how technology to local personnel. Every year about eight to ten visits by Chinese engineers to company A of Malaysia to discuss technical issues such as problems faced in the assembling process, production, products, quality and new technology available. For example, recently, a group of technical engineers from China parent company were sent here to the plant recently to discuss on the issues regarding production of non-CFC compressor, a new technology transfer from China so as to improve the products' quality.

Now the parent company carried out the new series products, for example, King-Ice Series Refrigerator BCD-200WA, Cold Freeness Series Refrigerator BCD-197WA, six type of series of Full-Automatic Washing Machine, Direct Current Investor Washing Machine XQS60-518ID and XQB40-480IG.

5.1.6 Technology Linkages

LSSA's major activity is manufactory electronic products. However it did not manufacture all the electronic components that were used in the production of the final goods. Instead, a major portion of these components was subassemblies by local subcontractors. The electronic components that were used in the operations are normally purchased from

1. Parent company
2. Local companies
3. Local subcontractors

Therefore LSSA reported having some backward technological linkage with a number of local companies that acted as its subcontractors, and provided technical assistance to several of these local firms to improve the quality of the products.

LSSA had set up a specific Sub-contractor Support Department (SSD) to handle the sub-contractors' production issues. They set up the production line for its sub-contractors according to the production requirements. The sub-contractors were also assured of full professional or technical support in providing equipment and related input in the production inspection technology, raw material and detailed specifications of the components to be produced. Upon doing these, the sub-contractors should be able to run its normal operation smoothly. The SSD would send engineer to transfer know-how to these local sub-contractors, and also helps to solve the sub-contractors manpower problems (most of the sub-contractors' employees are not trained) by providing technical training and support to them. The local

sub-contractors send selected staff from all level of production including operators. Supervisors and engineers to LSSA for adequate training and these personnel will become instructors when they return to their companies. Types of training given were based on the job specification. For instance, the engineers were sent to LSSA to learn how to interpret the specific technology documents and supervisors were trained on managing the production line in the sub-contractors' situation.

5.2 Analytical Factor Affect Investment in Host Country

The most important reason why countries try to attract foreign investment is perhaps the prospect of acquiring modern technology, interpreted broadly to include product, process and distribution technology, as well as management and marketing skills. By inviting MNCs to invest within their national boundaries, host countries hope to gain access to technologies and skills they do not yet possess. Foreign investment can result in benefits for host countries even if the MNCs decide to carry out their foreign operations in wholly-owned affiliates, since technology is to some extent a public good. These benefits take the form of various types of externality, and are often referred to as 'productivity spillovers'. For example, local firms maybe able to improve their productivity as a result of forward or backward linkage with MNC affiliates. They may imitate MNC technologies; or they may hire workers trained by MNCs, the increase in competition that occurs as a result of foreign entry may also be considered a benefit, in particular if it forces local firms to introduce new technology and work harder. Another group of potential host country benefits that have contributed to the more positive attitudes towards FDI can be categorized as 'market access spillovers'. MNCs

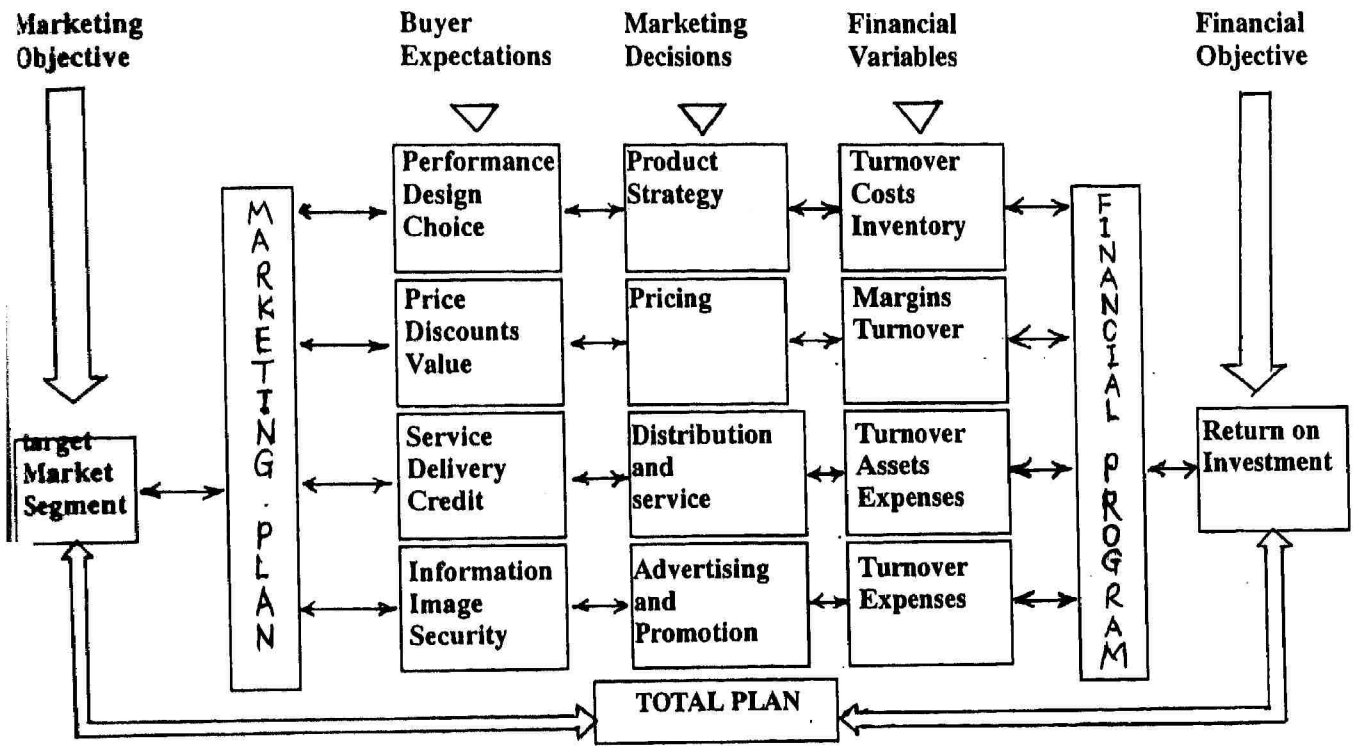
often possess strong competitive advantages in entering world markets, such as experience and knowledge of international marketing, established international distribution networks, and lobbying power in their home countries. As a result of their own export operations, MNCs may pave the way for local firms to enter the same export markets, either because they create transport infrastructure or because they disseminate information about foreign markets that can also be used by local firms.

5.2.1 Strategic Objectives

In case of Wu Xi Little Swan Group, they have seven subsidiaries in the other countries, like Japan, Germany, Argentina, American, Malaysia, Hongkong and Indonesia. Every subsidiaries, they have their own office and plant, they have different strategic objectives in the different country.

Figure 5 interprets these differences in terms of our discussions with subsidiary and headquarters management. All companies recognized both market share (left-hand) and financial (right-hand) objectives, but the emphasis on each of these objectives differed markedly. The subsidiary company of Asia placed much more emphasis on the left-hand or market objectives and most of subsidiary companies of Little Swan in some developed countries gave overwhelming emphasis to right-hand or profit performance.

Figure 5.4: Integrating Marketing and Financial Strategic

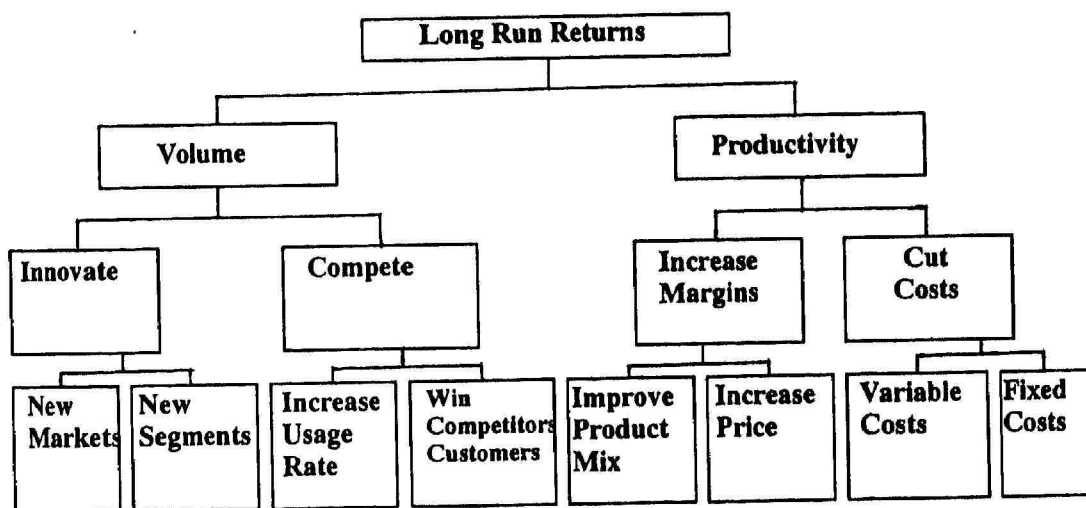


In the left-hand-orientated companies, business decisions were clearly market orientated. Managers started with ambitious share objectives negotiated with headquarters. Target market segments were then selected and the expectations of these customers were basis for market plans. These plans often took many years before they were fulfilled because of the necessity to invest in product development, brand building and distribution systems that would satisfy more effectively than competitors the aspirations of customers. In the long run the strategies were clearly working and giving there companies both market and financial success (Doyle, 1992).

By contrast, the majority of other developed countries were in right-handed. Profitability or returns on investment targets were dictated by headquarters. Budgets rather than marketing plans provided the focus for top management. Productivity and profitability were indeed restored to record levels by the rationalizations, which had taken place. But this right-hand focus had (with the predictable lag), left market shares eroding and competitiveness declining. These right-hand companies had traded short-term improvements in efficiency for long-term enhancement of market effectiveness.

Strategic Focus

Figure 5.5: Strategic Focus



This difference in focus appeared due to differences in attitudes to profitability. This is illustrated in Figure 6. LSSA executives said that they saw profit performance in the long run being more assured by a focus on volume – expanding into new market segments or aggressive market penetration. They believed a focus on increased volume now would enable them to build competitive cost structures, to generate the resources to sustain product

development and to control their distribution channels in the future. The companies of other countries saw inadequate profits to be solved by an immediate right-hand focus on cost reduction, and improved productivity.

The advantage of companies in other country focus on productivity is that it leads to quick profit enhancement – operating expenses can be cut and return on investment can be rapidly boosted when profits are under pressure. The problem with this approach is that it can often lead to longer run erosion of market position. Cost reduction means a reduced investment in new product development, brand building and market support.

Managers of Malaysia subsidiary were remarkably more ambitious and clear about their marketing objectives. There are three reasons on setting up at Malaysia,

The political stability of the region differs greatly. Some countries, such as Indonesia, Thailand and India, have experienced great instability. There is stability government political in Malaysia, although there doesn't have big marketing like Indonesia and India. But for the whole Southeast Asia, there has about 500 million populations (Doyle, 1992).

5.2.2 Training of Local Employees in MNC Affiliates

The transfer of technology from MNC parents to affiliates is embodied in machinery, equipment, patent rights and expatriate managers and technicians, but is also realized through the training of the affiliates' local employees. This training affects most levels of employees,

from simple manufacturing operatives through supervisors to technically advanced professionals and top-level managers. Types of training range from on-the-job training to seminars and more formal schooling to overseas education, perhaps at the parent company, depending on the skills needed. Although higher positions are often initially reserved for expatriates, the local share typically increases over time. The various skills gained while working for an affiliate may spill over as the employees move to other firms, or set up their own businesses (Blomstrom and Globerman, 1999).

Studies in developing countries have recorded spillovers of both technical and management skills. MNCs offer more training of various sorts to their managers than private local firms do, although not more than joint ventures or public firms. Managers also move from MNCs to other firms and contribute to the diffusion of expertise. Of the managers in private local and public firms who had training from elsewhere, the majority had received it while working for MNCs – joint ventures, on the other hand, seemed to recruit mainly from public firms. Yet mobility seemed to be lower for managers employed by MNCs than for managers in local firms (Gerschenberg 1987).

Another factor in the dissemination of technology and human capital skills is related to the R&D efforts undertaken by the MNC affiliates. First, MNCs do undertake R&D in their host countries, although it is strongly concentrated to the home countries. The affiliates' research efforts could be important, and should be compared with the R&D efforts of local firms, rather than with the parents' total R&D. In addition, they have access to the aggregate

expertise base of the parent and related affiliates, and sometimes also to the parent's R&D affiliates. The affiliates' R&D may therefore be more efficient than that of local firms. Not much is known, however, about what type of R&D is done in affiliates – and even less is known about the mobility of R&D personnel or the effects in the host country's technological capability (Blomstrom, 2000).

Judging from the aggregate evidence on spillovers from the training of MNC personnel, there seems to be a definite accumulation of human capital skills in the MNCs' employee stock. Some of these skills can be appropriated by local firms when employees move to new jobs.

LSSA had shown an example of the Chinese FDI investing in labour-intensive industries by its enormous employment. This outstanding characteristic has eventually increased the importance of human and personnel upgrading in transferring know how technologies to the local personnel. The emphasis on training shows the attempts of these Chinese companies to upgrade the skills of local workforce.

The case studied shows that most of the technology transfers was in the form of know-how and experience with standard, and well proven production techniques. They normally could not be embodied in the form of capital equipments or transmitted through blueprints and operation sheets. Therefore, training of local personnel was considered as one of the most important aspects of technological transfer by their Chinese companies. This includes both In-house and overseas attachment (in China's parent company) training. Furthermore, the

greater reliance of their Chinese overseas subsidiaries on “transfer through people” is closely connected to their preference for using FDI or Joint Venture (JV) as a mean to transfer technology. These subsidiaries being long term in nature, allow a more sufficient period for these Chinese to transfer personnel skill and know how to the host countries. A similar view is expressed by Du Pont, who emphasizes that a fundamental aspect of any technical assistance to a foreign country ought to be through human contacts. (Du Pant, 2000)

One of the manager explained that Chinese are more confident with methods developed and practiced in home country. Therefore OJT training, particularly on a man-to-man basis was used in most of the cases, especially in the technical skill training.

In general, the In-house training provided by these companies was basically towards the actual manufacturing operation process concerning machine operation and maintenance. On the other hand, the overseas attachment training provided their parents companies from oriented operation and technical.

It is interesting that, LSSA is the company that has a formal training department to provide formal training to its employees as well as employees of their sub-contractor.

5.2.3 The Importance of R&D Activities in Affiliates

Most MNCs have concentrated their research and development (R&D) operations in their home country. It has often been suggested that there are important externalities from R&D,

and it is possible that international operations that generate more research activities in the home country also enhance their productivity spillovers. Firms may also wish to establish affiliates in 'foreign centers of excellence' in order to draw on the existing stock of technical knowledge and learn from innovations made by local firms (Blomstrom 2000).

R&D constitutes a strategic activity, since it creates important assets on which the multinationals' future competitiveness is built. Therefore, research activities are usually under the direct control of headquarters, and confined mainly to the home countries. This implies that foreign subsidiaries are highly dependent on the innovation and R&D dynamics of parent company.

The amount of resources spent on R&D by a single foreign subsidiary depends on a combination of factors. Some of them have to do with the parent company's willingness and ability to decentralize the R&D function, while others depend on the characteristics of the host country, or stem from the performance and needs of the subsidiary itself.

The factor most commonly mentioned in favor of centralization of R&D is the existence of scale economies in the production of technological knowledge. Difficulties in project coordination, as well as the dispersion of resources for executing parallel projects in different places, may also call for centralization of R&D. Other factors working in the same direction are the need to control the diffusion of knowledge and protect industrial secrets. Some of these factors promote concentration of R&D to the home country, while others merely

promote centralization of it somewhere (see Haaparanta, 1996).

Other factors, however, encourage decentralization of R&D. Examples include the need to adapt production processes and characteristics of products to local market conditions and regulations. It is sometimes necessary to reduce the scale of production or modify products to suit local prescriptions, local consumers' tastes or some other specific conditions. In general, factors that promote decentralization are related to the choice of location of production, to industry-specific factors, and to some aspects regarding the performance of production units abroad. R&D units abroad could also serve as recruiting stations for local scientists and technicians, and as points of contact with the scientific community in the host country. Furthermore, the cost of skilled labour, such as engineers and technicians, might be important when choosing a location for R&D activities (see Lall, 1977).

It seems reasonable to expect that the determinants of investments in adaptive or innovative R&D will differ, since the tasks of improving and adapting products and/or processes are not subject to the same degree of uncertainty as other types of research activities. The uncertainty is lower concerning both the characteristics of the results and the chances of success. Furthermore, adaptive R&D is complement and improvements through adaptations, after-sales services, better quality control, and special customer design may give rise to additional benefits (Blomstrom 2000).

From this case study, the determinants of R&D activities in foreign majority-owned affiliates

are positively influenced by certain technological characteristics of the China parent company. Such as its R&D intensity, the share of R&D expenditures that the parent devotes to the development of new technological assets, and its level of labour skills. Which is a proxy for the technological capabilities not reflected by a firm's expenditures on R&D. Certain characteristics of the affiliates also have an influence on their technological creativity. That is, the extent to which they are dedicated to production (as opposed to being a sales office) and the degree to which their production is intended for export to third markets, the less the affiliates import from the parent, and the more they export.

The Usage of Chinese Expatriates

As mentioned above, the extent of Chinese technology transfer is vitally dependent on the efficiency of the human and personnel upgrading. The postings of personnel (Chinese Expatriates) therefore also play an important role in Chinese technology transfer. Specific technologies may be recorded on paper but the knowledge of their implementation normally resides in the minds of these people. Thus, the transfer of technology will often involve transfer of expert personnel. Information gathered on this aspect from the interview shows that Chinese Expatriates have been playing a critical role in transferring technologies to local personnel.

Chinese's Preferences of Manufacturing Facilities

At this case studied, LSSA has used a newly constructed manufacturing facility during their initial operations. The manager explained that their Chinese parent company believed in the

importance of new manufacturing facilities for the attainment of higher productivity. It has even used a custom designed manufacturing facility to fit the exact needs of the production facility and to balance of the production capacity in order to ensure a high efficiency in the production.

LSSA used almost ninety percent of old and used mercenaries from its parent company from China. The executive interviewed claimed that used equipments were more labour intensive and thus more appropriate for Malaysia for the time being. Moreover, such equipment would also be more cost effective because they are no longer useful in China due to product mix changes. Through FDI, transfer technology to it owns subsidiary and thus the plant and equipment options that they adopt are determine their transfer techniques and mechanisms.

5.2.4 Factor Affects the Nature and Extent of Technology Transfer

Type of Investment and Form of Industries

Some theory suggests that foreign direct investment and multinational corporations arise because of shortcomings in arm's-length markets for intangible assets (Caves, 1996). These assets can be found in knowledge, technology, organization, and managerial and marketing skills. Given that a firm possesses some intangible asset and that it has decided to exploit it by foreign production.

There are three such stylized modes for organizing the activity: subsidiary production, joint

ventures and licensing agreements. These three organizational forms or modes of technology transfer represent different advantages and disadvantages for a firm. If production is internalized in a subsidiary, firms may keep more rents from their intangibles than if they choose some other form. On the other hand, there are normally differences in costs associated with the alternatives.

A useful model of the determinants of the firm's organizational choice is given in Globerman, (1979). There which the choice between affiliates, joint ventures, and licensing is assumed to depend on transaction cost issues (abstracting from the host country's policy). The principal determinants of these costs are the degree to which the technological know-how (that is the intangible asset) involved is proprietary, complex and tactical, and frequency of contemplated transfers. Frequency matters, since set-up costs are involved in subsidiary production, and these can be spread over a large number of transfers.

Multinationals with a lot of experience of foreign operations are also likely to exploit their rent-yielding assets by internalizing their production abroad. "Learning by doing" occurs in international technology transfers, in the sense that the transfer costs decrease with the number of transfers. Furthermore, uncertainty levels decline as the firms become more familiar with international operations in general, and with their individual markets in particular (Cantwell, 1989).

The nature of technology transfer is very much depended on the type of FDI undertaken and

kinds of industry being operated. The Case studies obviously prove it. It acted as investments in resource-based industry. Export Platform types of investment obviously prove their intention to take advantage of cheap and abundant supplies of semi-skilled labour and initially directed to labour-intensive production process. And the transfer of technology eventually has the most effect on domestic employment, as it is concentrated in labour-intensive activities. The produce completes goods that require substantial input of labour. However being operation in the technology-oriented industry such as electronic appliance products industry, it relies more on design technology. Therefore the transfer of the latest technology and stringent production management are a necessity to there producers (Blomstrom 1997).

The international works sharing of manufacturing were still viable for certain industries. In LSSA most of its components supplied by its parent plant in China and thus it becomes the major assemble plant. Therefore, the technology transferred to the plant is mainly focuses on standard production process technology.

Another kind of Export Platform Investment is in labour-intensive parts of a production process for sale in world market, the capital or technology-intensive part of the production being produced in a capital or technology-intensive part of the production being produced in the capital or technology-rich countries. LSSA confirms to the principle of international division of labour.

Equity Participation

In general, the extent of the technical involvement of the foreign partner firm in a joint venture may be expected to be higher than in the case of technical collaboration agreements. Ozawa, when discussing the potential comparative merits, from the standpoint of technology transfer to a developing country, between fully owned subsidiaries of foreign concerns and joint venture alternatives, states that the latter provides more opportunities for transfer than the former.

This case study shows us a contradictory situation in which a complete technology transfer of the compressor assembling process technology has been occurred in a joint venture company. Even though the parent company has only minority share holding, forty percent capital participation as compared to the one hundred equities holds by parent company, it has higher technical involvement in transferring technology to local personnel.

Moreover, the significant contribution of the Chinese firm under the joint-venture was due to its organizational and technical resources. The local partner has been sought for its ability to raise local financing and its familiarity with the bureaucracy and its knowledge of local conditions. Such a combination of abilities has proved conducive to effective transfers of technology. The Chinese counterpart needs the resources of the local partner, and its objectives are broader than under a technical collaboration agreement. Hence its technical involvement is likely to be higher.

Effects on Home Countries

In particular, it is likely that the linkages between MNCs and their suppliers in the home countries yield similar effects as linkages in the host countries. For example, productivity spillovers could occur if the MNCs have to adapt their products to local conditions abroad and if that adaptation implies that the suppliers in the home country also have to change their production processes in order to meet the new requirements. As noted earlier, it is also possible that some productivity spillovers may occur as a result of 'reverse technology transfer'. MNCs establishing affiliates in foreign 'centers of excellence' may benefit from spillovers and learn about new technologies that are transferred back to the home country (see Arrell and Pain 1997; Cantwell, 1989).

Similarly, market access spillovers to local suppliers in the home countries are possible, and probably more likely in cases where the MNCs are involved in vertically integrated operations that require trade in intermediates between different parts of the corporation. It is also possible that home country firms without formal linkages to the MNCs can benefit from market access spillovers. A positive effect of production abroad on home country exports may result if production of one part of a parent company's range of products familiarizes a market with the parent company's (or the home country's) name and reputation.

The effects of labour training taking place within the multinationals may also be comparable to those in host countries – the skills embodied in MNC managers who work or receive parts of their training in foreign affiliates may in particular be transferable to other firms in the

home countries. For example, a manager of a foreign subsidiary may return to the home country for a new position in a local firm, which has no international experience, and use his or her knowledge of the foreign country to open up an export market for the new employer. Another potential source for productivity spillovers in the home country is the MNCs' research and development activities. The research skills embodied in scientific personnel are often of a general character that can be used in many circumstances, and the training provided by MNCs may therefore easily spill over to local firms. However, we are again plagued by a lack of detailed case studies, and it is not possible to make any conclusive statements about the significance of these effects (Blomstrom 1998).

The structural effects of FDI in home countries, the 'own' MNCs are much more important for the national economy than foreign MNCs are in most host countries. Although empirical studies have generally observed complementarity between overseas production and home country exports (see Blomstrom and Kokko, 1998), we know that the home country's export structure changes as a result of foreign investment. Instead of shipping finished products to foreign consumers, MNC parents turn to shipping intermediate products to their foreign affiliates. Moreover, exports from the MNC's suppliers of raw materials and intermediates in the home country may increase as a result of foreign investment. Both positive and negative productivity spillovers may be related to these structural effects of FDI.

Starting with the research activities, there seems to be an agreement that R&D spillovers are both prevalent and important. Moreover, R&D spillovers are considered to be a major source

of endogenous growth in various recent growth models (see, Romer, 1990). Thus the increasing R&D activities at home that normally follow a firm's investment abroad can be expected to result in positive spillovers in the home country. The effects on the home country of a specialization in intermediate products have.