Technological Capabilities and Samsung’s International Production Strategies in East Asia

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7 International production networks in China

Weak technological capabilities in international management and product change led to a loss of competitive advantage by Samsung’s foreign subsidiaries operating in high labour cost economies. These deficiencies also impeded Samsung’s establishment of effective international production networks in Southeast Asia. Ultimately, Samsung came to understand the importance of strategic cooperation between its affiliated companies producing end-product and components.

In 1993, Samsung’s top management made a special effort to improve overseas production. The rapid formation of integrated production networks in China enabled it to facilitate the timely transfer of the parent firm’s production capability to the subsidiaries. This was partly a result of close cooperation between the group’s affiliated companies, cooperation which was significantly improved after 1993 and the introduction of the new management movement.

This chapter examines the relationship between Samsung’s technological capabilities and international production in China, particularly focusing on production, component sourcing, marketing and product design and development in the face of continuing global competition. The chapter consists of five parts: (1) an overview of international production networks in China; (2) a review of external factors motivating Samsung’s international production; (3) a description of foreign subsidiaries’ key value-added activities (4) discussion of R&D internationalisation of established MNCs; (5) an assessment of technological capabilities and the growth of Samsung’s subsidiaries; and (6) a summary.
Overview of production networks in China

Establishing integrated production networks

From the late 1980s, before diplomatic relations between Korea and China were normalised, Samsung started to look for international production opportunities in China. In 1992, SEC and SEM began production of audio products, speakers and audio decks, and computer-related components in Guangdong province. At this time, SEC tendered for a government contract manufacturing VCR deck mechanism units at Dalian, but lost the tender to Matsushita.

Table 7.1 Samsung Electronics’ manufacturing subsidiaries in China, 1995

<table>
<thead>
<tr>
<th>Location</th>
<th>Name of foreign affiliates</th>
<th>Year of establishment &amp; (operation)</th>
<th>Samsung’s ownership (%)</th>
<th>Product items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangdong</td>
<td>Dongguan Samsung Electro-Mechanics Co., Ltd (Dongguan SEM)</td>
<td>1990 (June 1992)</td>
<td>80</td>
<td>Speakers, audio decks, keyboards, etc.</td>
</tr>
<tr>
<td>Tianjin</td>
<td>Tianjin Samsung Corning Co., Ltd (Tianjin SC)</td>
<td>Apr 1992 (Aug 1992)</td>
<td>100</td>
<td>VCR components (rotary transformers)</td>
</tr>
<tr>
<td>Tianjin</td>
<td>Tianjin Samsung Electro-Mechanics Co., Ltd (Tianjin SEM)</td>
<td>Dec 1993 (May 1994)</td>
<td>80</td>
<td>Flyback transformers (FBTs), tuners, VCR drums, heads, etc.</td>
</tr>
<tr>
<td>Tianjin</td>
<td>Tianjin Samsung Aerospace Industry Co., Ltd (SAI Tianjin)</td>
<td>1994 (July 1994)</td>
<td>50</td>
<td>Cameras</td>
</tr>
<tr>
<td>Tianjin</td>
<td>Tianjin Tongguang Samsung Electronics Co., Ltd (TTSEC)</td>
<td>Apr 1994 (June 1994)</td>
<td>50</td>
<td>CTVs</td>
</tr>
<tr>
<td>Tianjin</td>
<td>Tianjin Samsung Electronics Co., Ltd (TSEC)</td>
<td>Jan 1993 (Nov 1993)</td>
<td>50</td>
<td>VCRs and VCR decks</td>
</tr>
<tr>
<td>Jinan</td>
<td>Shandong Samsung Telecommunication Co., Ltd (Shandong SST)</td>
<td>1993 (1994)</td>
<td>46</td>
<td>Time division exchanges (TDXs)</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>Samsung Semiconductor Electronics Suzhou Co., Ltd (SSESC)</td>
<td>1995 (to begin in 1996)</td>
<td>100</td>
<td>Non-memory ICs</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>Suzhou SEC Ltd (Suzhou SEC)</td>
<td>1995 (to begin in 1996)</td>
<td>80</td>
<td>Refrigerators, microwave ovens, washing machines and air conditioners</td>
</tr>
</tbody>
</table>

Source: Compiled from company data and author’s interviews, 24-28 October 1995
The state run electronics manufacturing firm in Tianjin, Tianjin Broadcasting Corporation (TBC), expressed an interest in forming a VCR manufacturing joint venture with SEC in 1992. Tianjin has a population of over 9 million, is situated near Korea and is strategically located for both marketing and manufacturing. In April 1993, approval was given to Tianjin Samsung Electronics Co (TSEC) to begin operations, and production of VCRs in the TBC factory started in June. Subsequently, SEM joined this project, manufacturing core components for VCRs. TBC was also interested in joint production of CTVs with SEC and formed a new joint venture. Samsung also plans to produce microwave ovens, washing machines, refrigerators and non-memory ICs in Suzhou.

Figure 7.1 Samsung’s vertical production network in Tianjin, China

![Diagram of Samsung's vertical production network in Tianjin, China]

Source: Compiled from company data and author’s interviews, 24-28 October 1995

Samsung quickly established an integrated production network in Tianjin. VCRs were produced by TSEC in 1993, core components of VCRs by Tianjin SEM in 1993, CTVs by TTSEC in 1994 and rotary transformers by Tianjin SC in 1992. Tianjin SEM sells TTSEC tuners and TSEC VCR drums, motors and VCR heads. In addition, Tianjin SC supplies Tianjin SEM rotary transformers for the assembly of VCR drums (see Figure
7.1). Samsung has thus established a vertically integrated production system, joining a number of the group affiliated firms such as SC, SEM, SED and SEC. SEC has also established a joint venture producing time division exchanges (TDXs) in Shandong.

In December 1995, SED decided to produce CRTs for delivery to TTSEC in Shenzhen, Guangdong province. SC is also planning to build a plant near SED’s subsidiary to produce glass bulbs for use in CRT production. In Suzhou, SEC’s semiconductor plant gained approval for the production of ICs such as transistors used for consumer electronics products. These components are also used by TTSEC, TSEC in Tianjin and Huizhou-SEC in Guangdong. As Samsung extended its production networks in China, small and medium-sized Korean components suppliers increased their operations nearby, and they also developed links with other Korean end-product manufacturers operating in China — manufacturers such as Goldstar and Hyundai.

Compared with its activities the ASEAN region, Samsung moved quickly into China. It was at ‘the front of the pack’ — in particular coinciding with the entry of the Japanese MNCs. This reflects an aggressive FDI strategy under which Samsung quickly transferred and exploited its technological capabilities, unlike the Japanese firms which were generally cautious about investment in China. They were concerned that they might lose their technological capabilities to Chinese firms and feared that they had no real chance of getting a slice of the Chinese market. Another factor motivating Samsung’s FDI was that the Chinese regulatory environment initially encouraged foreign direct investment for export activities, providing a chance to exploit Samsung’s mass production capability while taking advantage of low cost labour in China.

The operations of Samsung’s subsidiaries in China

Samsung Corning in Tianjin (Tianjin SC)

Tianjin SC, which produces rotary transformers, was the first subsidiary in China established by Samsung Corning. SC has built up its production capability in rotary transformers since the late 1980s (SC 1994). Unlike other affiliates for the production of components, Tianjin SC came to China prior to the establishment of SEC’s end-product
VCR assembly plant. In contrast to SC Malaysia, which produces glass bulbs, there was not much capital investment due to the labour-intensive nature of its assembly works. Tianjin SC is involved only in the final assembly of rotary transformers, although it has now diversified to ceramic filters for telecommunications products.

SC Korea investigated the prospects for investment in China in 1991 because of the increase in labour costs in Korea and the appreciation of the won. Several locations, including Beijing, Tianjin and another location in northern China were considered, but Tianjin was selected because SEM and SEC planned to set up manufacturing plants in Tianjin. Samsung Corning preferred to establish a joint venture with one of the local Chinese manufacturing firms, but no suitable partner was available so SC set up a wholly-owned subsidiary. In April 1992 the foreign investment project was approved and production began in August of the same year. Initially, all products manufactured in Tianjin were exported to Korea because there was no single VCR plant operating in China when production commenced. Samsung made the decision to invest in China before its Japanese competitors, and production also actually began earlier (author’s interviews with Tianjin SC, 27 October 1995).

Production began with two assembly lines with a capacity of 800,000 units. This was expanded to five lines in December 1992. From 1993, more sophisticated products were added, such as four-channel rotary transformers in addition to the two-channel type. Tianjin SC planned to expand production to 5 million units per year (SC 1994:561).

By late 1995, Tianjin SC was operating a total of 16 production lines. Most of the products are rotary transformers used for VCR heads and the rest are ceramic filters used for cordless phones. As productivity increased, the final assembling work was gradually transferred to Tianjin from SC Korea. By mid 1995, 50 per cent of the total production of rotary transformers for SC was produced by Tianjin SC, and it was set to increase to 80 per cent in 1996.
All the products made in Tianjin are sent to SC Korea for quality inspection before being distributed to customers. As production capacity has increased over time, the quality of products has improved gradually, and is now equivalent to those made in Korea. SC thus plans to allocate its material manufacturing process, which is currently undertaken in Korea, to Tianjin.

In the early stages, all products were exported to Korea for re-export to Southeast Asia and Europe. After local VCR manufacturers started operation, the local demand for rotary transformers gradually increased. In late 1995, local market distribution reached nearly 30 per cent. Major buyers of Tianjin SC are Tianjin SEM, and Funai, which operates in Dongguan, Guangdong province. The supply of rotary transformers to Japanese buyers is also likely to increase. Toshiba in Dalian was considering the use of Tianjin SC’s products, and similarly Matsushita was considering a shift from in-house manufacture of its rotary transformers to outsourcing. According to Tianjin SC’s forecasts, local market consumption of its products will increase rapidly, but local market share (30 per cent of total production in late 1995) may not change despite a substantial increase in production capacity. As the production of ceramic filters is introduced, Motorola and Ericsson will be potential customers. Furthermore, Tianjin SC plans to take over from SC Korea’s international marketing activities covering Southeast Asia (author’s interviews, 27 October 1995).

Almost all materials are imported from Korea because local sourcing is unavailable. Although SC originally planned to cooperate with one of the small or medium-sized Korean material manufacturers, plans to undertake local production in Tianjin were abandoned because Tianjin SC’s production scale was so small. As Tianjin SC’s production increases and its products diversify from consumer electronics to telecommunication products, more small and medium-sized Korean component suppliers are likely to locate in the vicinity.

**Tianjin Samsung Electronics (TSEC)**

TSEC was SEC’s third offshore VCR plant, following the establishment of plants in Spain and Indonesia. In January 1993, SEC set up a cooperative arrangement with one
of China’s state-run electronics firms, TBC. TBC had produced black and white TV sets from 1958 and colour TV sets from 1980 before it allied with Samsung. The Chinese government approved a 50:50 joint venture between SEC and TBC with a total investment of $US 64 million for the production of VCR sets. SEC initially planned to produce VCR decks and drums in addition to VCR sets. SEC, however, invited SEM to manufacture VCR components specifically for the subsidiary.

By late 1995, TSEC’s production capacity was 600,000 units per year, but there is scope for plant capacity to increase to 1.5 million sets per annum. VCRs, which are distributed to both local and export markets, are made on the same production line using a flexible production system. In 1994, TSEC started to establish PCB and VCR deck assembly lines in its factory. Production capability has improved gradually. TSEC’s defect ratio decreased from 2.1 per cent in 1994 to 1.8 per cent in 1995, and sales per employee rose from $US 44,000 in 1994 to $85,000 in 1995. Production increased from 173,000 units in 1994 to 450,000 units in 1995.

TSEC’s local content ratio was about 40 per cent until the end of 1994 and is expected to reach 50 per cent by late 1995, slightly higher than Samsung Metrodata Indonesia, which was established in 1992 for the manufacture of VCRs. TSEC’s high local content ratio, which was achieved within a short period, resulted from the quick networking process which was undertaken between its affiliated companies’ subsidiaries such as Tianjin SEM and Tianjin SC. Other Korean component suppliers such as Sinheung Precision and Jeil Engineering supply deck housing materials and plastic cases to Samsung’s subsidiaries. Another factor which tends to increase TSEC’s local content ratio is that high duties on imported components and parts are levied when end-products are made with imported components and distributed locally. TSEC’s imported components are mostly limited to transistors and integrated circuits used for PCB assembly (author’s interviews with TSEC, 25 October 1995).

In 1993, TSEC became the first manufacturer to export VCRs made in China. TSEC’s long-term objective is to penetrate the local market while targeting the global market in the short term. According to TSEC’s strategic plan, output is expected to increase from
450,000 units in 1995 to about 2.5 million sets by the year 2000. About 45 per cent of the products manufactured in 1995 were exported to the Commonwealth of Independent States (CIS), Australia and the United States, while the rest was locally distributed. One of the major export markets is the CIS, which took nearly a half of the VCR sets exported. TSEC sells its products under the Samsung brand name in China and had seized nearly 30 per cent of the Tianjin's VCR market share by late 1995. TSEC is continuing to expand its distribution channels in China. SEC Korea supported TSEC with a special promotion fund, but it ceased recently. It is doubtful whether TSEC's financial capability is sufficient to establish local marketing networks in time without support from SEC Korea.

TSEC regularly sends engineers from its R&D department to headquarters in Korea for some three months' training. In 1995, TSEC's R&D department was placing priority on increasing local component sourcing, rather than learning product change capability. TSEC planned to produce a new product, a TV-equipped VCR, in cooperation with TTSEC. For this, TSEC and TTSEC plan to set up a joint R&D laboratory to improve their product innovation and development capability (author's interviews, 25 October 1995). However, the financially weak Chinese partners may be unable to increase their share capital if an equal proportion of capital is to be invested by the both parties. In the short term, TSEC is in a better competitive position than Samsung subsidiaries operating in Southeast Asia, but this cannot be sustained in the long run unless its product change capability is improved quickly.

**Tianjin Samsung Electro-Mechanics (Tianjin SEM)**

SEM gained international production experience at its plants in Portugal and Thailand prior to investment in China. In 1992, the current Chinese partner had offered to establish a joint venture with SEM, but this offer was rejected by SEM as infeasible. The decision to set up a joint venture was made when SEC was planning to set up a VCR manufacturing plant in Tianjin and requested SEM to take part in the manufacture of core components such as VCR drums, heads and drum motors. In October 1993 SEM made a joint venture agreement to set up Tianjin SEM with a Tianjin-based Chinese tuner manufacturer and the project was approved by the Chinese government in
December 1993. SEM's strategy was to relocate some product items which were losing competitive advantage in Korea to China. The timing of SEM's entry into China coincided almost exactly with that of its Japanese rival, Matsushita, which established a plant in Dalian.

Initially, SEM held an 80 per cent share in this project while the Chinese partner company held 20 per cent. SEM's equity later rose to 91 per cent with the Chinese partner holding 9 per cent. Tianjin SEM tried to utilise the existing facilities which the Chinese partner company had used for the production of tuners, but had to replace the outdated and inefficient facilities with machinery and equipment imported from Korea.

The monthly production capacity in 1994 was 300,000 tuners for TVs and VCRs; 120,000 VCR heads; 300,000 precision motors; and 50,000 computer spindle motors (SEM January 1994). Tianjin SEM produces all nine product items used for VCRs, CTVs and computers. In May 1994, Tianjin SEM started mass production of VCR heads, head motors and tuners, and VCR drum production commenced in August the same year. Like subsidiaries such as SEM Thailand and Dongguan SEM, Tianjin SEM has also actively expanded its production facilities. According to Tianjin SEM's 1995 plan, total manufactured components have increased to three times the 1994 total. The production of particular products has increased rapidly. Monthly production capacity during 1995 (between August and December) increased from 200,000 to 300,000 drums; from 300,000 to 500,000 drum motors; and from 270,000 to 360,000 tuners. SEM planned to produce capacitors (condensers) in December 1995 and to increase production capacity further.

Tianjin SEM has endeavoured to achieve scale economies. Its scale of production is larger than that of Matsushita in Dalian, where Matsushita currently produces VCR components with a capacity of 1.5 million per year or less than 150,000 per month, compared with 200,000 VCR drums per month produced by Tianjin SEM. To allow early completion of factory expansion, about 30 Korean engineers were dispatched by SEM Korea to assist Tianjin SEM to install machinery and equipment and train the local
employees. Tianjin SEM also benefited from the employment of local workers with a couple of years’ experience in the manufacture of electronic components.

Initially, a Korean manager was directly involved in the management of the local Chinese workers, but his role has been transferred to a Chinese manager. It was found that some aspects of the Korean operating system such as the incentive system were difficult to apply to the local situation so that adaptation and modification were necessary (author’s interviews with Tianjin SEM, 26 October 1995). Tianjin SEM continues to benefit from discussion about the local culture and system conducted with other Samsung affiliated subsidiaries such as TTSEC, Tianjin SC and SAI Tianjin. Samsung frequently organises seminars in which the six Tianjin-based affiliated companies share local business knowledge. Having an integrated production system in a single location allows the sharing of information, and this is one of the benefits generated by ‘multifaceted integration’ advocated in the 1993 ‘new management’ movement.

By late 1995, Tianjin SEM exported about 70 per cent of its components to Korea, while the rest was locally distributed. Distribution to local CTV and VCR manufacturers accounts for about 40 per cent of tuners, and about 15 per cent of VCRs. Many of the components which were exported to Korea were re-distributed to Samsung’s foreign subsidiaries.

Due to the relatively weak infrastructure of supporting industries in China, materials which were used for component manufacture were mostly sourced from Korea and Japan. Although it was not operational by late 1995, Tianjin SEM planned to establish a design and development operation by 1996. Tianjin SEM currently maintains close cooperation with Toshiba in Dalian. The long-term relationship between Samsung and Toshiba has continued in the form of technological cooperation through the exchange of technical information between the two SEC subsidiaries and Toshiba’s subsidiaries in China.
**Tianjin Tongguang Samsung Electronics (TTSEC)**

In 1994, SEC formed a 50:50 joint venture company with TBC to produce TV sets in Tianjin. SEC invested US$30 million in the TBC-run CTV plant for joint production. TTSEC was the largest CTV manufacturer among the SEC-run foreign CTV subsidiaries. SEC had accumulated international production experience by running several foreign CTV plants. In late 1995, TTSEC produced 800,000 CTVs, of which 21 inch CTVs were made for the local market and 14 inch CTVs were manufactured for the export market.

Before its alliance with Samsung, TBC’s production of CTVs for the local market had been inefficient. It seems that the success of TBC’s VCR production with SEC encouraged the Chinese partner to invite SEC to be a partner in joint production of CTVs. In August 1994, TTSEC began actual operations. Since then, TTSEC has increased its productivity by adopting SEC’s technology.

For TTSEC, the local market was more important than the export market. By late 1995, it was distributing about 60 per cent of its total CTV production locally, while the rest, mostly 14 inch CTVs, was exported to the United States. The Thai production subsidiary (TSE) had supplied 14 inch CTVs to the US market, but SEC Korea switched CTV sourcing from TSE to TTSEC because TTSEC had to conform with the Chinese government policy under which foreign ventures were encouraged to increase exports.

About 90 per cent of production was distributed through wholesale networks in China, but distribution through department stores gradually increased during 1995. The local Chinese market shifted from a sellers’ market to a buyers’ market. TTSEC learned that although the local market demand for 21 inch CTV sets accounted for a total of 50 per cent of CTV demand, local consumption of 25 inch TV sets steadily was growing. In a departure from normal practice, TTSEC’s products were distributed to the local market under ‘Beijing’, the brand name TBC had used since 1938. However, TTSEC planned to introduce the Samsung brand name from 1996. TTSEC’s marketing department trains local Chinese employees to adopt a customer-oriented marketing approach. A Korean manager admitted that it was difficult to teach marketing concepts to those familiar with...
commercial practices in a centrally planned economy. To achieve cost efficiencies and economies of scope, TTSEC plans to set up integrated distribution channels in cooperation with other affiliated subsidiaries such as TSEC and Huizhou SEC (author’s interviews with TTSEC, 25 October 1995).

In the manufacture of the products distributed to the local Chinese market, TTSEC purchased almost all its components from local suppliers. By November 1995, almost 130 local firms supplied TTSEC with components such as 21 inch CRTs, FBTs, transformers and cabinets. Transistors and integrated circuits for PCB assembly were mostly imported. In particular, TTSEC purchased 14 inch CRTs from the Malaysia-based SEC subsidiary (SED Malaysia). It appears that components made by local Chinese suppliers were not suitable for the manufacture of high quality export products. To solve this problem, TTSEC cooperated with Korean components suppliers such as Jeil Engineering and Shinheung Precision which operated nearby.

TTSEC’s product design department had a total of 110 designers and engineers, the largest R&D function of all Samsung’s overseas subsidiaries. According to a Korean manager, their design skills were not comparable with those in SEC Korea (author’s interviews, 25 October 1995). Thus, close cooperation between TTSEC and SEC Korea’s design and development functions was necessary to improve TTSEC’s design and product development capability. At the time of interview in November 1995, TTSEC’s major task was to modify SEC Korea’s previously exported product models to the requirements of local Chinese customers, taking into account the differences between Chinese market preferences and those of the United States and Europe. In April 1994, TTSEC sent seven Chinese engineers to SEC Korea for joint development of 21 inch TV sets. The CTV sets were expected to be introduced into the local market in late 1995 or early 1996. For the development of 25 inch, 29 inch and VCR-equipped CTVs, TTSEC planned to cooperate with SEC Korea and TSEC. In addition, the Beijing-based regional headquarters initiated an integrated design and development centre for the subsidiaries in China. However, no relationship was established with SEC-run overseas design centres in the United States, Europe and Tokyo.
Samsung Aerospace Industries, Tianjin (SAI Tianjin)

In 1994 Samsung set up a 55:45 joint venture firm with a local camera manufacturer, Tianjin Camera. Tianjin Camera began production of cameras in 1956, but closed its factory in 1990 because its competitiveness had declined drastically against Japanese camera imports. SAI Tianjin took over Tianjin Camera’s factory building along with their equipment and facilities, but these had to be replaced with equipment imported from Korea. Samsung’s motivation for this investment was to reduce manufacturing costs and to penetrate the Chinese market. SAI Tianjin claims that Tianjin had a locational advantage in the manufacture of cameras because of the superiority of the local mechanical engineering support industry. In July 1994, SAI Tianjin started production.

In late 1995, SAI Tianjin produced 360,000 units per year, but in 1996 production was expected to increase output to 700,000 units. The local content ratio of SAI Tianjin is high and there were plans to increase local content to 80 per cent in 1996 from 60 per cent in 1995. SAI Tianjin interacts closely with local Chinese component suppliers. It purchases almost 80 per cent of its components from Chinese suppliers, with the rest provided by Korean suppliers operating in Tianjin. SAI Tianjin is able to access Korean suppliers who deliver their components to Tianjin SEM, TSEC and TTSEC. These Korean suppliers provide SAI Tianjin with plastic components. Local market sales have grown steadily, increasing from 10 per cent of total production in 1995 to 15 per cent in 1996. The majority of products is exported to Hong Kong, Thailand and Singapore.

One of the most impressive efforts of SAI Tianjin was to use local R&D institutions for the development of a new camera product. To do this, SAI Tianjin allied with one of the local R&D institutes. According to Samsung, SAI Tianjin reached an agreement with a local R&D institute for the development of a technologically simple camera. One Korean executive director stated that a benefit of this cooperation is that the cost of camera development in China is about 50 per cent less than in Korea. In addition, SAI Tianjin has a long-term plan to set up its own in-house R&D institute in cooperation with the local R&D institutes in China (author’s interview with SAI Tianjin, 27 October 1995).
**Huizhou Samsung Electronics (Huizhou SEC)**

In 1993, SEC established a majority joint venture company to produce audio-related components with two partners in Guangdong, where SEM's Dongguan plant is located. SEC owns 90 per cent of the shares, while its Chinese and Hong Kong partners each has five per cent. Huizhou SEC was the second offshore audio plant, beginning production of audio products in November 1992. Its capacity in 1994 was 540,000 units and it supplied 15 per cent of its total production to the local market. SEC's technological capability in the manufacture of audio products is inferior to its CTV, VCR and microwave oven production, but an opportunity to improve its new audio product design capability will be provided by Lux, a Japanese company acquired by SEC in 1994 (see Chapter 5).

**Dongguan Samsung Electro-Mechanics (Dongguan SEM)**

In 1990, SEM was involved in two foreign investment projects, one in Thailand and the other in Dongguan, China. In July 1990, SEM established a wholly owned subsidiary, Dongguan Samsung Electro-Mechanics, in Guangdong to manufacture audio and computer components. Actual production started in June 1992. In July 1992 SEM Korea sent trainers to this subsidiary for 70 days to train local employees (SEM June 1994). Production capacity had expanded by July 1994: from 400,000 audio decks to 800,000; from 1.8 million audio speakers to 4 million; from 100,000 computer keyboards to 300,000. Dongguan SEM invested in this location along with several other Korean companies. To meet increasing demand, it built a new plant some 10 km from the first factory in June 1994. Materials were procured from Korea (80 per cent) and China (19 per cent), and the components were distributed to Southeast Asia, China, America and Korea (EIAK 1993). It also supplied audio-related components to Huizhou SEC.

**Samsung Shandong Telecommunications (Shandong SST)**

Shandong SST is a high-tech FDI project which produces time division exchanges (TDXs), which combine telecommunications, computer and semiconductor technologies. SST had begun to acquire production knowledge of TDXs from the 1980s. Production of TDXs increased from one million in 1982 to three million in 1987 and then to 3.5 million in 1988. TDXs were distributed to the Philippines, Colombia, the
CIS and Poland (SEMM May 1993). SEC set up a joint venture company in Shandong investing $US 20 million with two local partners (with holdings of 38 per cent), of which one was a state-run telecommunications corporation. It produced 370,000 TDXs in 1995.

**External factors motivating international production in China**

There are two main external factors which motivated Samsung to invest in China: the liberalisation of the Korean electronics market and China’s growing locational advantage as an export production base accompanied by expanding local market demand in China.

**Liberalisation of the Korean domestic market**

After import restrictions on electronics goods in Korea were removed in 1989, global electronics manufacturers entered the Korean market, which had been protected for nearly two decades. SEC was accustomed to selling half of its products on the Korean domestic market. There was no guarantee that Samsung would retain this share of the domestic market in competition with established MNCs. Samsung needed to take counter action in response to the entry of established MNCs to the Korean market.

An investigation of the circumstances surrounding Taiwan’s market liberalisation showed that Taiwanese electronics firms had been seriously threatened by imported Japanese products. Samsung’s research (SEMM April 1991) showed that Taiwanese producers lost significant market share when faced with competition from Japanese products. The local market share of Japanese brand products increased dramatically between 1986 and 1990 following the liberalisation of Taiwan’s domestic market (see Table 7.2).

The Taiwanese experience suggested the possibility that about 50 per cent of Samsung’s products which had been sold on the Korean market might be seriously threatened by the entry of established MNCs into Korea unless effective measures were taken. Moreover, Samsung’s foreign investment in the United States and Southeast Asia faced serious competition from global players and indigenous firms. This was partly a result of problems with the performance of its foreign subsidiaries. Although Samsung’s production capacity in New Jersey had reached a million CTV sets, Table 7.3 indicates
Table 7.2 Changes in market share by product in Taiwan (per cent)

<table>
<thead>
<tr>
<th>Origin of brand</th>
<th>1986</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTVs Taiwan</td>
<td>81.6</td>
<td>22.3</td>
</tr>
<tr>
<td>CTVs Japan</td>
<td>18.5</td>
<td>77.5</td>
</tr>
<tr>
<td>VCRs Taiwan</td>
<td>56.7</td>
<td>14.0</td>
</tr>
<tr>
<td>VCRs Japan</td>
<td>43.3</td>
<td>86.0</td>
</tr>
<tr>
<td>Refrigerators Taiwan</td>
<td>59.9</td>
<td>28.8</td>
</tr>
<tr>
<td>Refrigerators Japan</td>
<td>35.5</td>
<td>62.2</td>
</tr>
<tr>
<td>Washing machines Taiwan</td>
<td>46.5</td>
<td>19.8</td>
</tr>
<tr>
<td>Washing machines Japan</td>
<td>48.7</td>
<td>72.1</td>
</tr>
</tbody>
</table>

Sources: SMM, April 1991

Table 7.3 Samsung’s production in Korea and US exports of strategic products, 1987 ($US million)

<table>
<thead>
<tr>
<th>Korean Production (A)</th>
<th>US Exports (B)</th>
<th>B/A (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTVs</td>
<td>420.2</td>
<td>136.0</td>
</tr>
<tr>
<td>VCRs</td>
<td>511.5</td>
<td>178.0</td>
</tr>
<tr>
<td>Microwave Ovens</td>
<td>279.8</td>
<td>155.4</td>
</tr>
</tbody>
</table>

Source: Data compiled from Domicity (1988: 8-27)

that a large volume of CTVs were still exported from a production plant in Korea. Samsung had failed to establish a low cost production base in Southeast Asia quickly, unlike its Japanese counterparts. Due to the poor performance of Samsung’s foreign subsidiaries, Samsung needed to establish foreign production bases which would be able to achieve cost efficiencies.

**Improved FDI climate in China with the establishment of export bases and growing demand in the Chinese market**

Initially, one of the major motivations for FDI by Samsung was to secure low cost production bases in China for exports. The first end-product subsidiary in China was Huizhou SEC which produces audio systems and exports most of them to the global market. Another example is the production of cameras by SAI Tianjin: almost all its products were exported overseas during the early stage of production. Although
Samsung continues to shift its strategy from a global approach to a combination of global and local strategies, exports still exceeded products distributed in the local market in late 1995. Chinese economic reforms promoting exports were the basis of Samsung's investment in China.

In 1979 China started to open up to foreign investment, and exports were encouraged. Exports were to be as high as possible. The pattern of trade was to be governed by the law of comparative advantage, making use of the international division of labour to improve efficiency (Hsueh and Woo, 1992: 57) In 1980, in line with new investment legislation, special economic zones (SEZs) along the Southeast coast of China were established in Shenzhen, Shantou, Zhuhai and Xiamen. The aim was to attract investment from overseas Chinese (Fukasaku et al. 1994) in order to increase exports.

 Preferential tax rates and more favourable foreign exchange retention systems were applied to SEZs, and later to the coastal open areas to encourage foreign investment, particularly that which was export-oriented (Hsueh and Woo, 1992: 58). In 1983 China set out detailed regulations for the implementation of the joint venture law. In 1984 foreign firms operating in SEZs were given a two-year tax holiday. This also applied to 14 coastal cities and Hainan Island. These coastal cities included Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao and Guangzhou. In 1986 China actively encouraged foreign investment by the introduction of a law relating to wholly owned foreign enterprises and provisions for the encouragement of foreign investment. FDI picked up to about $US 6 billion in 1988-89 but stagnated in 1990 due to the Tiananmen incident in June 1989 (Tan 1995).

In 1987, China attempted to stimulate export via tax rebate policies and subsequently planned to return all product taxes and value-added taxes levied on exported commodities via different channels such as extension of specialised credit for industrial exports, provision of short-term exchange credits, granting of various types of financial and administrative privileges and strengthening of export production bases (Hsueh and Woo, 1992: 61).
In 1990, the State Council introduced general regulations for the sale and transfer of land use rights in cities and towns. Thus, companies and individuals were allowed to obtain land use rights and to undertake land development. In 1992 China became more open to FDI. In line with Deng Xiaoping’s call for further economic reform made during his historic visit to South China in January 1992 (Tan 1995), many restrictions on foreign investment were relaxed. At the same time foreign consumer goods plants which were formerly required to export their products were now allowed to distribute to the local market. In addition, local authorities were also given more autonomy to accept foreign investment without central government approval. In particular, the establishment of diplomatic relations between Korea and China in 1992 promoted Korean investment in China.

Table 7.4 Development of a foreign investment climate in China

<table>
<thead>
<tr>
<th>Year</th>
<th>Major measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>Enactment of detailed rules for implementation of 1979 joint venture law.</td>
</tr>
<tr>
<td>1985</td>
<td>Introduction of law on foreign economic contracts.</td>
</tr>
<tr>
<td>1990</td>
<td>Enactment of detailed rules for implementation law on foreign wholly-owned enterprises. Issue of general regulations for sale and transfer of land use. Issue of regulations to encourage investment from overseas Chinese and compatriots from Hong Kong and Macao.</td>
</tr>
<tr>
<td>1991</td>
<td>Introduction of income tax law on foreign-funded enterprises and foreign enterprises.</td>
</tr>
<tr>
<td>1992</td>
<td>Relaxation of many restrictions on foreign investors.</td>
</tr>
<tr>
<td>1995</td>
<td>Introduction of new guidelines for sector-based emphasis on foreign investment, encouraging sectors such as agriculture, transportation, energy sectors and high technology. This reform is in line with the international practice of providing sector-based investment incentives (Business Times, 2 August 1995)</td>
</tr>
</tbody>
</table>

Source: Compiled from Fukasaku et al. (1994: 53-55)
From the mid 1990s, Samsung’s strategy evolved from a global approach to a combined global and local market orientation. A typical example is Shandong SST, which began manufacture of telecommunication products (TDXs) to meet local market demand in 1994. Later in 1995 Samsung gained approval to establish Suzhou SEC to produce consumer electronics goods such as refrigerators, washing machines and air conditioners. All products were expected to be sold on the local market. At the same time, Samsung’s subsidiaries that were initially established for export production began to sell products on the local market. By October 1995 about 15 per cent of audio systems made by Huizhou SEC and nearly 10 per cent of cameras manufactured by SAI Tianjin were sold on the local market. At this time TSEC and TTSEC distributed nearly 50 per cent of their VCRs and CTVs to the local market (author’s interviews, 24-28 October 1995).

Samsung’s local strategy was a result of the rapid growth in personal income and consumption in China. For instance, demand for colour TVs in the local Chinese market grew rapidly, more than keeping pace with the growth of other consumer durables. According to a World Bank Report (1990), the rate of TV set ownership increased to 13.2 per cent, (50 per cent in Beijing) in 1988, up from 3 per cent in 1978. In rural China only about 10 per cent of households have black and white TVs and fewer than 4 per cent have colour TVs. As illustrated in the report, annual demand for TVs in China has continued to increase: demand for black and white TVs has increased from 10 million sets in 1988 to 12 million in 1995; CTVs from 14 million to 20.5 million during the same period.

Chinese CTV manufacturers were not able to meet the entire local demand. By 1986, according to the World Bank Report, 56 factories supplied about 4 million CTV sets, which accounted for about 55 per cent of local demand. The rest was imported. At the same time, almost 45 per cent of the CTVs assembled in China was based on imported kits. Moreover, VCR import dependency was much higher than that for CTVs. Of the 2 million units of local VCR demand in 1993, only 10 per cent was supplied by Matsushita’s CKD assembly plant in China, and the rest was imported (Nikkei Top, 6 October 1993).
There were three problems for local end-product manufacturers: under-utilisation of plant capacity, cost inefficiency and low product quality. For instance, the Xie Yan TV tube factory produced only 1.1 million units, while international competitors produced 1.5 to 3 million. The unit cost of a CTV set was 70-80 per cent higher than that of international competitors. Due to weaknesses in technological capability, key components such as glass bulbs, picture tubes, electronic guns, diode yokes and ICs were mostly sourced from overseas.

In 1985, the price of components in China was 120 per cent higher than that of international competitors. ICs and tuners were also nearly twice the price of foreign components. China-based firms had to pay about three times the price for Chinese fly back transformers than for internationally produced ones. This meant that Shanghai factories imported 75 per cent of their transformers from Japan (World Bank, 1990).

The rapidly growing end-product market and the drawbacks of component production in China were particularly attractive to potential investors like Samsung, a conglomerate which was able to establish a vertically integrated production system, producing both components and end-products by the utilisation of production capability in China.

**Foreign subsidiaries’ key value-added activities**

What were the main features of foreign subsidiaries’ operations in relation to key value-added activities such as production, component sourcing, marketing, design and product development?

*Rapidly growing production and adaptation*

SEC-run manufacturing subsidiaries in Southeast Asia found it hard to achieve economies of scale in the early stage of their operations. In contrast, the subsidiaries in China were able to make maximum use of the plants from the beginning. In November 1995, TSEC achieved a high plant utilisation ratio, over 70 per cent of the existing capacity which was newly built in early 1995, producing 450,000 VCR units. TTSEC
grew remarkably in its first years of operation: it increased its production volume from 600,000 sets in 1994, to 800,000 sets in 1995, and to 1.2 million sets in 1996.

Most of Samsung’s subsidiaries were able to employ local workers who had accumulated a moderate degree of production capability in the electronics sector over the previous couple of years. Tianjin Broadcasting & Communications (TBC), the joint venture partner of TTSEC and TSEC, had been producing CTVs for over 30 years before setting up operations with Samsung. The joint venture partners of Tianjin SEM and Tianjin SAI also had broad experience in electronic goods manufacture: the former undertook the production of tuners, and the latter manufactured cameras. Shandong SEC, which is producing TDXs, and a new CRT manufacturing subsidiary at Shenzhen are also experienced in electronics goods manufacture (see case studies of Chinese subsidiaries above).

This situation is in marked contrast to Samsung’s subsidiaries which were earlier established in the ASEAN region. Most of these joint venture partners had no experience in manufacturing electronic goods. In addition, most of the subsidiaries in China were not engaged in greenfield investment, but were in joint production with Chinese partner companies. Samsung provided up-to-date equipment such as chip-mounting machines and automatic soldering machines to the Chinese partners who lacked such technological capacity. Samsung thus introduced new technology and replaced old machinery and equipment with more advanced equipment, guaranteeing an improved product as well as higher productivity.

The subsidiaries in China have also been able to take advantage of the improved international management capability accumulated by Samsung’s previous operations. Prior to establishing TTSEC, SEC had accumulated international production experience through its operations in Portugal, the United States, Mexico and Thailand. Similarly, SEC gained knowledge in the international production of VCRs in Spain and Indonesia.

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1 The three component makers, SEM Tianjin, SEM Guangdong and Tianjin SC, also continued to expand their plant capacity. SEM Tianjin concentrated on the production of CTV and VCR components as well as computer related components.
before TSEC began production. In addition, the subsidiaries in China have easy access to ethnic Korean workers who speak both Chinese and Korean language. All subsidiaries employ ethnic Korean personnel to lessen the risk of communication problems (author’s interviews with Samsung subsidiaries, 24-28 October 1995).

Continuous Adaptation

Samsung subsidiaries adapt their production system so that they fit into the local socio-economic environment and to ensure the efficient operation of their plants. TSEC installed a flexible production system under which all VCR products are manufactured on the same production line, regardless of whether the products being produced are for export or local distribution. The system is not exactly the same as the one in the headquarters’ production plant, but has been modified to fit in with the local Chinese environment. For instance, TSEC’s production line is more labour intensive than the Korea-based VCR plant, not only because of the different levels of automation, but also because of the different skills of the assembly workers. In addition, the headquarters’ process innovation teams visit TSEC, and other overseas plants and make adaptations to the production system (author’s interviews with TSEC, 25 October 1995).

The human resource management system is also subject to adaptation. The employee incentive system which was transferred from the Korea-based plant is under substantial modification. One of the Korean managers acknowledged that ‘at the beginning of operation in China, we introduced an incentive scheme based on an individual worker’s performance. It had worked well in Korea, but we soon realised that it was inappropriate in China and led to complaints among some workers. In the end, we withdrew it, and the system is under modification in order to fit the local environment’. Acknowledging the socio-economic differences between Korea and China, most subsidiaries also modified their human resource management strategies so that Chinese managers were fully empowered to supervise Chinese workers (author’s interviews with TSEC and TTSEC, 25 October 1995).
**Component sourcing: a source of SEC's competitiveness**

SEC-run CTV, audio and VCR subsidiaries in China cooperated fairly well with their affiliated component manufacturers. From the beginning of operations, SEC and SEM jointly set out international production strategies to enable SEC-run subsidiaries (TSE, TTSEC and Huizhou SEC) to purchase the locally made components of SEM-run subsidiaries (Tianjin SEM and Dongguan SEM).

<table>
<thead>
<tr>
<th>Product items</th>
<th>August 1995</th>
<th>December 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drums</td>
<td>200,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Heads</td>
<td>600,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Tuners</td>
<td>270,000</td>
<td>360,000</td>
</tr>
<tr>
<td>FBTs</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>DMT</td>
<td>300,000</td>
<td>500,000</td>
</tr>
<tr>
<td>CMT</td>
<td>300,000</td>
<td>500,000</td>
</tr>
<tr>
<td>RF-MOD</td>
<td>50,000</td>
<td>150,000</td>
</tr>
</tbody>
</table>

Source: Author’s interviews, 26 October 1995

The component subsidiaries grew remarkably quickly. The production capacity of five of the seven products made by Tianjin SEM increased rapidly from August to December 1995 (see Table 7.5). Dongguan SEM, which produced audio and computer related components, expanded its production capacity by establishing a second plant nearby in response to increased market demand. Similarly, Tianjin SC and Tianjin SEM grew rapidly, making maximum use of their plant capacity. Subsequently, VCRs, audios and CTVs made by SEC-run subsidiaries in China became competitive because low cost component sourcing was available in the local market. It was anticipated that Suzhou SEC, which was to produce microwave ovens, refrigerators, air conditioners and washing machines, would be able to purchase competitively priced components from Tianjin SEM when it started operations in 1996. When SED’s Shenzhen-based subsidiary starts production of CRTs, TTSEC will further reduce its CTV production costs. The component subsidiaries achieved optimal plant utilisation despite the fact the Chinese market was not large enough to consume all of their components. This is because headquarters played an important role in the coordination of China-based
Figure 7.2 Samsung's regional production network in Asia: the flow of components and parts

M1: SED Malaysia (CPTs)
M2: SC Malaysia (CRT glass bulbs)
I: SME (VCRs and audio products)
T2: SEM Thailand (CTV and VCR components)
C1: Tianjin SC (rotary transformers)
C2: TSEC (VCRs, VCR decks and VCR drums)
C3: Tianjin SEM (VCR drum motors and tuners)
C4: Huizhou SEC (audio products)
C5: Dongguan SEM (speakers, keyboards, etc.)
C6: TTSEC (CTVs)
C7: SSESC (semiconductors)
C8: Suzhou SEC (refrigerators, microwave ovens, washing machines and air-conditioners)
C9: Samsung Aerospace Industries (cameras)

Notes: 1. M = Malaysia, T= Thailand, I = Indonesia. C= China
2. The two FDI projects in Suzhou (C7 +C8) have not been realised, but Samsung has bought a 33 hectare Suzhou industrial complex and plans to invest more than SUS 500 million into integrated electronics products from components to end-products (Business Times 19 September 1994)


manufacturing subsidiaries, plants in Korea and SEC-run foreign subsidiaries (see Figure 7.3). This is in contrast to the poor coordination shown during 1989-92 in the early
stage of operations in Southeast Asia (see Chapter 6). Improved coordination between headquarters and subsidiaries in China was mainly a result of Samsung’s 1993 ‘new management’ movement under which success in international production became a core strategy of globalisation and multi-faceted integration.

In November 1995, Tianjin SC was assembling rotary transformers and selling 30 per cent of its products locally. The rest was being exported to Korea where the components were being redistributed to SEC’s VCR plants in Korea and SEC-run overseas subsidiaries such as SME (Indonesia), TSE (Thailand) and SESA (Spain). An average of 70 per cent of the products made by Tianjin SEM is sent to the headquarters in Korea, where some of the products are delivered to SEC Korea plants manufacturing VCRs and computers and overseas subsidiaries such as SME in Indonesia. Dongguan SEM distributes 20 per cent of its components locally, of which a proportion of the audio components is sent to Huizhou-SEC in Guangdong with the majority of audio decks and keyboards for computers exported to Korea.

Tianjin SEM and Tianjin SC distribute about 30 per cent of their total products to the local Chinese market, while the rest (70 per cent) is sent to Korea. Local market expansion is essential to their future growth under Samsung’s regional strategy for the establishment of component manufacturing subsidiaries in Southeast Asia, China, North America and Europe.

Marketing: a combination of local and global strategies

In the early stages of production in China, Samsung end-product subsidiaries emphasised the global market, concentrating on the exploitation of low cost labour. Almost all the audio products Huizhou SEC produced between 1992 and 1993 were exported. At the same time, SAI Tianjin exported all cameras made in 1994 to the global market. The majority of VCRs manufactured by TSEC were also exported overseas.

Growing demand in the local market also benefited Samsung’s Chinese operations because they were strategically linked with Chinese electronics producers that had been
distributing CTVs in the local Chinese market. From the mid 1990s, VCRs and audio systems manufactured by TSEC and Huizhou SEC were sold on the local market. Although the global market share remained high, distribution to the local market grew rapidly from 1995: VCRs (40 per cent), audio products (15 per cent), and cameras (10 per cent). TTSEC began to differentiate market niches for CTV products to be distributed to the specific customers from high income groups (author’s interviews with TTSEC, 25 October 1995). It is also expected that Suzhou SEC will soon begin production of washing machines, refrigerators and air conditioners for the local market.

In global marketing activities, Samsung’s headquarters played a critical role on behalf of the subsidiaries. This meant that Samsung’s Chinese subsidiaries (except Shandong SEC) continued to be weak in the distribution of products to the local market, like the subsidiaries in Southeast Asia.

In Chapter 6, it was argued that centralised international marketing activities inhibited close interaction between subsidiaries and customers in international markets because this system had been hampered by lack of feedback regarding changing customers’ preferences in production and marketing functions. Under the local market strategy, an alternative approach is required, decentralising interaction between manufacturing and marketing functions so that a firm can meet the changing needs of consumers in a timely fashion. In a similar vein, the global marketing environment has also changed over time.

Global market distributors (including both Samsung’s own sales subsidiaries and OEM buyers) require multi-product models with small lot volumes per shipment because of the quick delivery systems now in place, in contrast to the market circumstances in the late 1980s. This was demonstrated by the difficulties faced by the Malaysia-based Samsung microwave oven plant in adapting to changes to GE’s distribution and delivery system (author’s interviews with SEMA, 10 July 1995, Chapter 6). Overseas manufacturing subsidiaries and global distributors have been cooperating more closely, but this has brought additional pressures.

Centralised marketing between headquarters and foreign subsidiaries
There are two weaknesses in Samsung’s inter-functional cooperation and interaction.
Firstly, most of the marketing resources and capabilities as well as the decision-making power have resided with headquarters. As a result, interaction between the subsidiaries’ marketing function and the overseas distribution channels — either SEC’s own marketing subsidiaries or OEM buyers — rarely occurs. This means that there is little feedback in the form of ‘on-the-spot-information’ about changing customers’ needs relating to the manufacturing and design and development functions of the subsidiaries.

Secondly, Samsung paid less attention to expanding local Chinese distribution and service channels than did Samsung’s Japanese competitors such as Matsushita. It is important to note that all Samsung’s end-product subsidiaries are joint ventures. The Chinese partners are mostly state-run companies which lack sufficient capital investment to expand local distribution channels. Accordingly, they tend to seek short-term performance rather than long-term growth (author’s interviews, 24-28 October 1995). This might result in a decline in the long-term competitive edge unless additional investment on the local market development is realised. For instance, TSEC’s long-term objective is to become a subsidiary with a production target of 1.4 million VCRs and a local market share of 20 per cent by the year 2000, up from only 4 per cent in 1995. TSEC partly depended on headquarters for its advertising expenditure during the early stages of operation, but as a newcomer in the VCR market in China, it obviously needs a huge capital investment in distribution, service and advertising. Around 60 per cent of CTV products made by TTSEC are sold through local wholesale distributors under the brand name ‘Beijing’, but Samsung brand CTVs will soon be sold on the local market. This will require additional capital investment for local market development in response to measures taken by established MNCs which continue to expand their local marketing and service channels.

**Local market development and decentralised marketing activity**

Samsung’s ‘multi-faceted integration’ strategy also reflects the importance of local market development. Samsung divides the world market into the four regions in which it has begun to establish integrated production networks (see Table 7.6). As a consequence, the volume of Samsung products exported to America and Europe, important export regions for Samsung’s Chinese subsidiaries will not continue to grow.
at its current rate because Samsung’s UK and Mexico’s regional production networks will soon serve their own regional markets. More specifically, the Mexico-based CTV plant is about to increase its production of CTVs to one million units. Microwave ovens exported to Europe from one of the Malaysia-based manufacturing subsidiaries will be gradually replaced by products from the UK-based plant, which was scheduled to commence production in late 1995.

Table 7.6 Regionally integrated production networks, 1995

<table>
<thead>
<tr>
<th>Region</th>
<th>SEC</th>
<th>SED</th>
<th>SEM</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFTA region</td>
<td>Indonesia (CDPs, VCRs, refrigerators and CTVs)</td>
<td>Malaysia (CPTs, CDTs)</td>
<td>Thailand (FBTs, DYs, tuners etc.)</td>
<td>Malaysia (glass bulbs)</td>
</tr>
<tr>
<td></td>
<td>Thailand (CTVs, VCPs, washing machines)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Malaysia (microwave ovens)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>Tianjin (CTVs, VCRs)</td>
<td>-</td>
<td>Tianjin (VCR components)</td>
<td>Tianjin (rotary transformers)</td>
</tr>
<tr>
<td></td>
<td>Huizhou (CDPs)</td>
<td></td>
<td>Guangdong (computer components)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weihai (TDXs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU region</td>
<td>Hungary (CTVs)</td>
<td>Germany (CPTs)</td>
<td>Portugal (FBTs, tuners etc.)</td>
<td>Germany (glass bulbs)</td>
</tr>
<tr>
<td></td>
<td>UK (CTVs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spain (VCRs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Czech (Refrigerators)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turkey (CTVs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Portugal (DRAMs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAFTA region</td>
<td>Mexico (CTVs)</td>
<td>Mexico (CPTs)</td>
<td>Mexico (FBTs, tuners etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brazil (CTVs)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled from Korea Economic Daily (3 November 1995)

Thus, local market development in China is of growing importance and requires strategic marketing. For manufacturers to satisfy local market demand and changing global customers at an appropriate pace, manufacturing and distribution needs to be closely coordinated with moves towards decentralisation. At the least, the subsidiaries need to be involved in manufacturing and marketing activities simultaneously.
Design and product development: largely dependent on headquarters

In contrast to the subsidiaries located in Southeast Asia, some of the subsidiaries such as TSEC and TTSEC in China possess their own design and development functions within the plants. In fact, TTSEC’s design and development function is not Samsung’s, but one inherited from the partner company which was recently taken over by TTSEC. With a relatively short history of joint operation, however, it has not been possible to conduct independent design and development activities because locally qualified engineers and designers are not available. Despite the existence of a local design function, whenever TTSEC needs new products, it has to depend on headquarters’ design and development functions.

Soon after TTSEC joined CTV production with TBC in 1994, several local designers were sent to SEC Korea to develop a 21 inch CTV for the Chinese market. The approach taken was to modify slightly for Chinese conditions SEC Korea’s previous CTV model which was exported to the global market. TTSEC’s local designers and engineers participated in the project, providing local market information. Despite the fact that over 100 local designers were working on design and product development, even minor changes in product capability were carried out by headquarters rather than the subsidiary. In contrast, TSEC’s design and development department had few local Chinese engineers and concentrated on increasing local component sourcing, not on product innovation and modification. TSEC also sent its local Chinese designers to SEC Korea for training (author’s interviews with TSEC and TTSEC, 25 October 1995).

China-based subsidiaries are more advanced in their design and development activities than Samsung’s subsidiaries in Southeast Asia. But centralised design and product development activities are common features of both production networks. This will be an obstacle to product innovation and development capability, which is essential to meet changing local customers’ preferences. In a unique departure from this practice, Tianjin Samsung Aerospace Industry was actively involved in camera product development activities in cooperation with local R&D laboratories. It contracted with a Tianjin-based university R&D laboratory to develop a low end camera model, at half the cost of development in Korea (see case study above).
As one manager acknowledged, the electronics goods market in China has been shifting rapidly from a sellers’ to a buyers’ market. It is important to determine the customer’s needs and to pass on this information to those responsible for design and development (author’s interviews with Beijing Office, 24 October 1995). This enables a firm to shorten product development time and assists with gaining a commercial edge.

Recently, SEC introduced a new product, Karaoke-TV, to the Chinese market, but its sales performance was poor. The new product was originally developed and manufactured by headquarters in Korea. Although several Korea-based designers and engineers visited China for market research and product planning, sales were far less than the forecast 200,000 to 300,000 units. Only about 60,000 units were sold. It appears that the product did not really suit the local customers’ tastes. This lesson shows that China-based subsidiaries are under increasing pressure to develop new products near the marketplace where on-the-spot-information is quickly fed back to production, marketing and design and development functions.

It is not always easy for subsidiaries to strengthen their design and development functions. Consensus and understanding are always necessary between both joint venture partners. There is also a need for additional capital investment and more Korean designers need to be stationed at the subsidiary, thus increasing operating costs. From the perspective of financially weak local joint venture partners, strengthening design and development functions may not be their major concern and interest. The current discussion of the establishment of a joint R&D function between TTSEC and TSEC exemplifies this problem.

Decision making undertaken at headquarters has been gradually decentralised to the China-based regional headquarters, in line with the ‘new management’ movement. However, most of the design resources and capabilities have remained at headquarters or in overseas design centres outside China and Southeast Asia. By November 1995, no China-based subsidiaries had established links with Samsung design centres in the United States, Japan or Germany, nor was there any interaction with foreign firms allied with
Samsung, or the foreign design and development firms acquired by SEC in the early 1990s.

**R & D internationalisation of established MNCs**

*Rapid transfer of technological capabilities*

A number of new global players have entered the Chinese market to embark on international production and existing foreign subsidiaries have continued to expand their production networks, from end-products to manufacturing components and materials. Both Samsung subsidiaries currently produce audio and visual products. The subsidiaries, which are also scheduled to manufacture products such as microwave ovens, washing machines and refrigerators in 1996, will face strong competitive pressure from Japanese, American and European MNCs.

Japanese MNCs have accelerated the transfer of their technological capability to China, while extending their international production networks in Asia. Recent international production projects undertaken by Matsushita include washing machines in Zhejiang province (*Nikkei Top*, 14 February 1992); CTVs in Jinan, Shandong Province from late 1996 with an annual production of 200,000 sets planned (*Nikkei Top*, 7 July 1995); automobile compact disc players aimed at the Southeast Asian market to be produced in Dalian from October 1995 (*Nikkei Top*, 10 May 1995) and pagers in Beijing (*Nikkei Top*, 13 April 1992). The washing machines will be in direct competition with those Suzhou SEC is scheduled to produce in 1996 as will the CTVs TTSEC is already producing.

In addition, Matsushita's Shanghai production of microwave ovens and their core component, magnetrons, was scheduled to begin in July 1995: the plant has the capacity to produce 300,000 ovens, and one million magnetrons annually (*Nikkei Top*, 6 July 1994). In spring 1994 Matsushita planned to start production of cellular phones in Beijing where Motolora holds 60 per cent of the Chinese market. Matsushita is engaged in international production (*Nikkei Top*, 6 December 1993), while Samsung products are made only in the Korea-based plant. Beijing Matsushita Colour CRT Co., incorporated in 1989, began the manufacture of 29 inch CRTs for the local Chinese
market with an initial capacity of 350,000 units a year (*Nikkei Industrial News*, 28 July 1993), in addition to the production of 14, 18 and 21 inch CRTs. That amounts to 1.8 million CRTs annually (*Nikkei Industrial News*, 21 April 1992).²

**Pressure to deepen production networks and towards decentralised R&D activities**

Since the establishment of its VCR deck mechanism production subsidiaries in Dalian, which started operations in 1994, Matsushita has been producing VCRs heads, cylinders and other core components equivalent to 1.5 million VCRs in China (*Nikkei Industrial News*, 22 November 1993). All nine local Chinese VCR makers purchase key VCR components almost exclusively from Matsushita, a VCR industry leader in China (*Nikkei Industrial News*, 22 November 1993). A new joint venture started operations in October 1995 producing ICs³ for domestic VCRs (*Nikkei Top*, 12 September 1994). Apart from deepening its vertical production networks, Matsushita has strong bargaining power in China for the further expansion of production networks, as a result of its alliance with the Ministry of Radio, Film and Television in China (*Nikkei Top*, 9 December 1992). In order to support its sixteen manufacturing subsidiaries and one sales subsidiary located in China, Matsushita established a direct management service network in China and opened offices in 12 provinces, as well as establishing a training centre for service engineers in Beijing (*Nikkei Top*, 7 March 1991). It plans to set up a production support system to provide staff training, business consulting, sales and services, market surveys and an advertising service (*Nikkei Top*, 23 August 1994).

Samsung’s competitive position in China has been strongly challenged by established MNCs. While Samsung produces magnetrons in Korea only, Matsushita manufactures them locally. Suzhou SEC will only start production of air conditioners in 1996, while Matsushita commenced production of 300,000 rotary compressors (the core component of air conditioners) in January 1995. Mitsubishi will be producing air conditioners from January 1998 and Hitachi will increase its production volume from 400,000 to 1.4

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² In 1996 SED will begin to produce CRTs in Shenzhen in cooperation with a local firm.  
³ Samsung is scheduled to assemble non-memory ICs in Suzhou (SEC 1995a).
million by 1998 (Nikkei Industrial News, 11 January 1995). Because of the strategic moves by established MNCs which have maintained not only a vertical production network but have also introduced prestigious brand names to the local Chinese market, Samsung has been under continuous pressure to transfer technological capability for the production of the more sophisticated components and materials.

Established MNCs have set up design and product development laboratories in Southeast Asia, as well as R&D laboratories in China and Southeast Asia which coordinate their activities with the China-based subsidiaries. Japanese MNCs have continued to upgrade their product change capability through cross-functional cooperation and interaction between manufacturing, marketing and service, and design and development in China. Toshiba and Matsushita have also started to strengthen customer service for home appliances in China. Inter-governmental coordination between China and Japan has also increased, with the establishment of a R&D support system in China: by 1997 the Chinese Academy of Sciences and MITI (Ministry of International Trade and Industry, Japan) plan to open a China-based advanced R&D centre, which will be engaged in developing and manufacturing computer software in Zhuhai, Guangdong province. This facility will involve a major financial investment and the recruitment of 2,000-3,000 engineers (Nikkei Top, 19 November 1991).

As noted earlier, Samsung’s product innovation and development is not as strong as that of its Japanese counterparts. This is due to weaknesses in design capability (see Chapter 5) and a lower overseas production ratio than that of its Japanese competitors (see Chapter 1). This means that more products are dependent on Korea-based production than overseas production. As global competition has accelerated, a market servicing strategy like that adopted by Japanese firms has been evolving, from export to international production (Tachiki 1994). This has put pressure on Samsung’s home-based production, as evidenced in the changing position of Korean-made video CDPs in China. The Video-CDP market in China has been dominated by Korean products, competing with those imported from Japan. Consumption is expected to increase to 500,000 units in 1996, twice as high as it was in 1995 (Junja Shimun, 18 November 1995). Demand for the Samsung brand video-CDPs imported from Korea has far
exceeded supply in the Chinese market. One of the main reasons for the maintenance of competitive advantage was price. Korean video CDPs are half the price and of a similar quality to Japanese brands. More recently, the fast growing video-CDP market in China has been augmented by the entry of Japanese and European competitors such as Sony, JVC, Sanyo, Pioneer and Philips (Junja Shimun, 18 November 1995). The technological capabilities of these firms — including a particularly high capability in design and product development and production systems — are far in advance of Samsung’s. Japanese firms, which enjoy a strong brand preference in China, have started to reduce their price, and they will possibly produce the product in China in cooperation with their Southeast Asian-based R&D networks. Local Chinese manufacturers are also able to manufacture these products more cheaply, although their product quality is lower than that of Samsung. These developments present new challenges to Samsung’s current and future competitiveness. Whether its market position can be maintained will depend on its ability to achieve more sophisticated technological capabilities quickly.

**Technological capabilities, foreign subsidiaries’ growth and global competitiveness**

From the beginning of its operations in China, Samsung organised international production in an effective and timely manner. The pace of internationalisation was greatly accelerated by the close cooperation between Samsung’s affiliated companies. Such cooperation was achieved by overcoming problems associated with the firm’s uncoordinated organisational culture, an administrative inheritance from the 1970s and 1980s.

Close cooperation between SEC and SEM, and between SC and SED allowed all available technological capabilities to be transferred to newly established or existing production subsidiaries. The 1993 organisational reform became a driving force which accelerated Samsung’s internationalisation process. Of ten foreign investment projects in China, eight were realised after 1993. With upgraded technological capabilities and fairly well designed strategies, Samsung was able to transfer and exploit its advanced production capability quickly. In China, a model for this well coordinated and
integrated production system was formed in Tianjin, China. As a result, overseas production ratios increased rapidly, from 25 per cent in 1994 to 40 per cent in 1995, the highest among Korean electronics firms (see Table 7.8).

In contrast to Samsung’s affiliated subsidiaries in Southeast Asia, both end-product makers and component manufacturers in China grew rapidly. For instance, TTSEC achieved substantial growth, and it is expected to be one of the most profitable of SEC’s overseas manufacturing subsidiaries in spite of its short period of operation. By the end of 1995, TSEC’s plant utilisation ratio was also satisfactory in spite of having less than a year’s operational experience at the new plant. Tianjin SEM and Tianjin SC have also enjoyed fast growth.

**Close cooperation between affiliated companies**

The first reason for Samsung’s quick internationalisation and good performance in Chinese foreign production is that there was close cooperation between Samsung’s affiliated companies and between the different business divisions within each firm. Local links between Samsung’s end-product makers and component subsidiaries were made quickly, and end-product subsidiaries were able to purchase cheap, high quality components from their affiliated component subsidiaries from the beginning of operations. Tianjin SEM, a component subsidiary, and TSEC, a VCR manufacturer, started production at almost the same time. TSEC and TTSEC faced no difficulties in purchasing local components nearby. In addition, Tianjin SEM had no difficulties in purchasing rotary transformers, one of the core components making VCR heads, from Tianjin SC, which is located nearby. This contrasted with the experience of TSE in Thailand, which had to wait for three to four years to purchase components from local affiliated components subsidiaries (see Table 7.9).

To achieve economies of scale, the affiliated component suppliers used intra-firm coordination between China and Korea to devise a strategic plan prior to implementation of their foreign investment plans. Given that end-product subsidiaries were not capable of purchasing all components produced by affiliated component subsidiaries, a large number of components were re-exported to Korea and distributed
to other affiliated end-product makers (author’s interviews with Tianjin SEM and Tianjin SC, 26-28 October 1995). The international competitiveness of these subsidiaries was challenged by technologically strong MNCs operating in low cost supply bases in Southeast Asia. The supply of high quality, low price components by the affiliated component subsidiaries became a source of competitive advantage for SEC-run subsidiaries in China.

Table 7.7 Overseas production ratios of Korean electronics firms, 1994-95

<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overseas production ratio</td>
<td>Amount ($US million)</td>
</tr>
<tr>
<td></td>
<td>(per cent)</td>
<td></td>
</tr>
<tr>
<td>Samsung</td>
<td>25</td>
<td>1,100</td>
</tr>
<tr>
<td>LG</td>
<td>10</td>
<td>640</td>
</tr>
<tr>
<td>Daewoo</td>
<td>13.4</td>
<td>430</td>
</tr>
</tbody>
</table>

Source: Dong- A Ilbo: 15 December 1995

In addition, cooperation between SEC’s different business units allowed quick transfer of technological capability. The Suzhou-based home appliance project is an example. SEC’s home appliance business division wanted to locate a plant in China, but the Chinese government responded negatively to this FDI project because China had a preference for Samsung to transfer sophisticated technological capabilities rather than low technology. Subsequently, SEC’s semiconductor business chose Suzhou as a location for IC production in order to coordinate foreign investment with its home appliance business division. Because of the link with IC production, the Chinese government approved Samsung’s investment in the home appliance manufacturing plant in Suzhou (author’s interview with Samsung Beijing Office, 24 October 1995).

Quick transfer of technological capabilities

A further second reason for Samsung’s successful internationalisation in China was the rapid transfer of its technological capabilities to its China-based subsidiaries. Samsung adopted an aggressive technology transfer strategy in China, in contrast to the defensive one it adopted in Southeast Asia. More sophisticated technological capabilities were
transferred to China than was the case in Southeast Asia. For instance, VCR component, TDX and IC manufacturing technological capabilities were transferred to China, but they have not yet been transferred to ASEAN countries.

Table 7.8 Comparison of subsidiaries’ performance: TSE in Thailand and TTSEC in China

<table>
<thead>
<tr>
<th></th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>TSE</td>
<td>TTSEC</td>
<td>TSE</td>
</tr>
<tr>
<td>Plant utilisation ratio (%)  a</td>
<td>20</td>
<td>65</td>
<td>30</td>
</tr>
<tr>
<td>Availability of locally sourced CRTs</td>
<td>No</td>
<td>Yes  b</td>
<td>No</td>
</tr>
<tr>
<td>Availability of locally sourced FBTs, tuners</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Availability of design and development function within subsidiary</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:

a TSE’s initial plant capacity was 500,000 and CTV production started in 1989, while TTSEC’s capacity was 800,000 and began production in 1994. Information on TSE’s plant utilisation ratio is based on SEC monthly magazine and that of TTSEC is based on author’s interviews, 24-28 October 1995.

b TTSEC was able to purchase low cost 14 inch CRTs made by SED Malaysia, one of the affiliated subsidiaries based in Southeast Asia.

Source: Compiled from author’s interviews, 1-15 July and 24-28 October 1995 and SMM (various years).

The timing of the transfer of VCR and IC technology through foreign direct investment to China was nearly the same as that of Japanese firms such as Matsushita and Toshiba (see Ohta et al. 1994). In addition, the technological capabilities for VCR head, drum and motor production represent relatively new technologies, and those of TDX require more sophisticated production utilising computer, telecommunication and semiconductor technology.

To regain its competitive advantage, Samsung emphasised ‘speed-based competition’ through the quick transfer of its technology to overseas subsidiaries. In so doing,
Samsung developed strategic alliances with Chinese manufacturers by way of joint production, rather than greenfield foreign investment. This enabled Samsung to make optimum use of its production capability in cooperation with Chinese partners who had prior experience in manufacturing electronics goods. This method of operation by Samsung in China is different from its approach in Southeast Asia, where Samsung cooperated with local companies which had no prior experience in electronics production and were mostly dependent on greenfield investment.

Moreover, the Chinese subsidiaries interact laterally with headquarters. This allows quick technology transfer through close cooperation between headquarters and subsidiaries. Unlike the Southeast Asian production subsidiaries, the head of each SEC-run subsidiary in China is an executive director rather than a manager. As a consequence, Samsung’s foreign subsidiaries are able to exercise greater bargaining power in interacting with headquarters.

**R&D internationalisation and foreign subsidiaries’ innovation**

Samsung’s relatively good performance in China is due partly to the rapid improvement in the production capability of its subsidiaries. This may not seem difficult but there were challenges. Chinese joint venture partners had long been operating with technologically out-dated machinery and equipment, under a centrally controlled economic system. To a large extent, the competitive advantage of Samsung’s subsidiaries stems from the introduction of efficient production systems, not from superior product innovation, product design and development capability, or from strategic marketing. Because of the small and temporary nature of new MNCs’ technological capabilities, production capability alone cannot be a source of sustainable competitiveness. It can easily be matched by the Chinese manufacturing companies unless it is complemented by product and process change capability.

The lesson learnt from the divestment of Samsung’s US-based CTV subsidiary (see Chapter 4) was that quality production performance would not necessarily guarantee the sustainable competitiveness of overseas manufacturing subsidiaries. Samsung’s CTV subsidiary, with a weak product change capability, was forced to withdraw from the
United States because its temporary competitive advantage quickly evaporated when Southeast Asia-based manufacturers were able to imitate it.

Given the acceleration of global competition, Samsung might still not place a sufficiently high priority on the improvement of product change capability in China. Samsung’s operations are still mainly concentrated on the exploitation of its production capability, and do not truly focus on the creation and improvement of a ‘difficult-to-imitate technological capability’. The unsuccessful introduction of Karaoke TV into the Chinese market shows that the production function there needs to interact more closely with local design and development and marketing functions.

As technologically strong MNCs continue to internationalise their R&D to East Asia, Samsung’s weak product change capability is expected to come under strong pressure. In spite of decentralised relations between headquarters and subsidiaries as a result of the 1993 ‘new management’ movement, Samsung’s R&D internationalisation did not proceed as quickly as that of other established MNCs. This is probably because of the relatively immature nature of its design and product development capability (see Chapters 4 and 5).

It is expected that there will be increased demand for various kinds of electronics products on the Chinese market. The Chinese market features simultaneous demand for black and white TVs, colour TVs and wide screen TVs. A firm with a superior product change capability has an advantage in penetrating the local market because it can meet different customers’ preferences quickly and provide a rich product mix. Since indigenous firms are expected to increase their production capability quickly, a narrow focus on a single group of customers with standardised products will lead to problems in maintaining competitive advantage, as was the case in Southeast Asia (see Chapter 6). To cope with technologically superior Japanese, European and American electronics MNCs which continue to upgrade their own design and development capability in the region, improvement of Samsung’s design and product development capability is essential.
Summary

The rise of Samsung’s international production in China was closely associated with the 1993 organisational reform and took place under conditions of growing global competition. Unlike the tardy international production undertaken during the early stages of investment in Southeast Asia, Samsung accelerated its internationalisation in China. Samsung’s motivation for undertaking foreign investment was not only to establish a low cost production base for exports but also to take advantage of the growing local market demand, as well as to cope with the liberalisation of the Korean market on which Samsung was dependent for nearly half its sales. The two strategies of ‘globalisation and ‘multi-faceted integration’ became a basis for Samsung’s international expansion, and they were strongly backed by top management.

Like the Southeast Asian subsidiaries, SEC subsidiaries in China mostly centred on production activities, while design and product development were dependent on SEC Korea. The relationship between headquarters and subsidiaries continued to be centralised.

Samsung’s subsidiaries improved their production capability because most of the joint venture firms had prior experience in the manufacture of electronics goods. The upgrading of product change capability proceeded slowly. This was mostly because of the relatively short period of operation but it was also due to transfer-capability constraints in design and product development. The international competitiveness of end-products made by Samsung’s subsidiaries in the region was largely derived from cost efficiencies gained by affiliated component subsidiaries which achieved economies of scale, partly because of the close cooperation between headquarters and subsidiaries which was in turn linked to an improved international management capability.

SEC-run subsidiaries in China, unlike the Southeast Asia-based subsidiaries, achieved satisfactory production performance. This performance was dependent on production capability, rather than product innovation or development. Established MNCs in China invested in R&D, enabling the quick transfer of design and development capability. At
the same time, their foreign subsidiaries interacted with local and global R&D networks to improve their product change capability.

To sustain its international competitiveness, Samsung intends to establish a regionally integrated production system. Under such a system, production supporting activities such as marketing and R&D should be undertaken near the production plants as well as incorporating close cooperation between headquarters in Korea and the globally dispersed subsidiaries.
8 Conclusions

The case of Samsung suggests that the technological capability of a new MNC is an important factor influencing its strategic behaviour in foreign direct investment. Other important influences include external factors such as the international trade environment, factor costs and domestic and international competitors. In the face of global competition, it is important for a new MNC to achieve cost efficiency while upgrading its technological capability. Whether the subsidiaries of new MNCs perform well or not in foreign locations depends on how quickly they learn and improve on the technological capabilities necessary for survival in a changing market. Weak technological capability is a major constraint on a new MNC competing effectively with established MNCs.

This chapter summarises the main findings of the study, discusses the dynamics of a new MNC's international production and the elements of success and failure in international production by a new MNC. It considers the policy and strategic implications for new MNCs and for developing countries in the Asia Pacific region. There is also a discussion of the limitations of the study and some suggestions for future research directions.

Main findings

**Samsung's acquisition and development of technological capabilities**

The major sources for the acquisition of technological capabilities by Samsung have changed over time. Foreign joint venture partners were the main source of technological capabilities during the 1970s; foreign licences, in-house R&D centres and foreign R&D laboratories dominated in the 1980s; and strategic alliances, and the acquisition and use of foreign design houses were the main sources of technology in the 1990s. Samsung's learning priorities also shifted from assembly capability in consumer electronics production, to enhanced capability in DRAM production in the 1980s, followed by an emphasis on capability in design and product development and international management in the 1990s.
For over two decades, during the 1970s and the 1980s, Samsung focused on improving its production capability through ‘learning-by-doing’ while forming alliances with foreign OEM buyers who provided product designs and access to the international market. This resulted in a high standard of production capability but relatively weak design and product development capacity. The historical development of Samsung’s technological capabilities indicates that Samsung mastered an ‘easy-to-learn technological capability’ first and postponed its acquisition of ‘difficult-to-learn technological capabilities’ such as product design and development. This eventually exposed a weakness in product differentiation when strategy shifted from a global to a combination of global and local strategies in the mid 1990s.

**Relationship between Samsung’s technological capability and international production**

In the early stages of Samsung’s international expansion, from 1969 to 1982, SEC established two foreign subsidiaries, a US marketing subsidiary and a CTV plant based in Portugal. One of the objectives of these two foreign investment ventures was to complement SEC’s technological weaknesses by acquiring international management experience prior to investment in the United States. Samsung’s choice of foreign location was affected by Goldstar’s moves in 1978 and 1981, but it was also influenced by Samsung’s conservative organisational culture. Under external pressure to invest overseas, Samsung sought to gain international production experience in Portugal, while Goldstar established a CTV plant in the United States without any prior experience of international production.

In the mid 1980s, Samsung’s strength was in its mass production capability, but it lacked capability in product change and international management. As export markets were threatened by import barriers erected by the United States and Europe, Samsung established production plants in high labour cost economies to avoid tariffs. This was viewed as a means of securing its existing export markets in spite of its weakness in product change capability. In the late 1980s, Samsung extended its overseas production to Thailand and Mexico because its plants in Korea, the United States and Europe faced difficulties in sustaining competitiveness. As before, Samsung followed Goldstar’s lead.
in an attempt to defend its established export markets. In addition to the establishment of overseas production plants, Samsung established an R&D laboratory in the United States in a bid to gain DRAM technology that was difficult to acquire in Korea. This was Samsung’s first attempt to invest overseas as a means of expanding its R&D capacity.

In the 1990s, Samsung’s international expansion was closely associated with the exploitation and creation of technological capabilities in response to developments in both global and regional markets. In the light of the imbalance between its advanced production capability and its weak product change capability, Samsung attempted to exploit its mature production capability through overseas production subsidiaries in low labour cost economies while setting up overseas R&D and design centres in the United States and Europe to improve its product change capability. In addition, Samsung established regionally integrated production bases, transferring the vertically integrated production system of its Korean operations overseas. This strategy arose from Samsung’s two strategic pillars of ‘globalisation’ and ‘multi-faceted integration’. Samsung’s aim was to maintain its competitive advantage in production capability, while improving capabilities in international management and design and product innovation. In an environment of accelerated global competition, Samsung’s international expansion was intended to create a ‘difficult-to-imitate’ technological capability, alongside the rapid exploitation of its mature production capability.

**Declining international competitiveness, technological capability and strategic change**

Samsung’s international competitive advantage, particularly in consumer and industrial products, declined during 1989-93. There were three major reasons for this, particularly in consumer and industrial electronics (with the exception of DRAMs and their components). They can be viewed from the perspective of Samsung’s trajectory of technological acquisition and development.
Firstly, Samsung was over-dependent on its foreign OEM buyers providing it with designs and entry to the international market. In its alliance with OEM buyers, Samsung had no difficulty in maintaining international competitiveness until the mid 1980s. During this stage when home-based production dominated, the OEM buyers’ strength in design and international marketing fitted in well with the strength of Samsung’s mass production capability. However, the advantage of location in Korea declined as a result of currency appreciation and increased labour costs, and alliances between Samsung and its OEM buyers faltered as Southeast Asia-based manufacturers became more competitive than Samsung. Its competitors in Southeast Asia, mostly established MNC subsidiaries, were producing product lines similar to those of Samsung in Korea by using low cost Southeast Asian labour.

Secondly, Samsung’s US and European production subsidiaries did not operate successfully in the 1980s. This was caused by a lack of technological capability in product change, poor linkages with local component suppliers. Due to the weakness of its product change capability, the US-based CTV plant was unable to introduce and develop the new products which were demanded by US customers when Samsung’s standardised and low end CTVs became uncompetitive. Moreover, SEC failed to establish links with local component suppliers or set up local suppliers, despite the fact that affiliated component manufacturers were technologically able to invest overseas. This created an additional burden, since SEC was faced with increased production costs when the United States imposed levies on imported CTV components from Korea.

The third reason for SEC’s decreasing international competitiveness was its lack of international management capability, for instance, the lack of coordination between headquarters and subsidiaries, and between SEC and its affiliated component suppliers, particularly in the early stages of international expansion in the ASEAN region. The pace of investment in Southeast Asia was slow because Samsung’s affiliated firms invested independently, without close cooperation. SEC’s technology transfer to the region proceeded in a piecemeal fashion despite the fact that there was an urgent need to exploit its mature production capability quickly in these low cost production bases.
took longer to improve its subsidiaries’ production capabilities than did its Japanese counterparts.

In the early 1990s, Samsung’s top management realised that unsuccessful international production was one of the major reasons for its decreasing international competitiveness. There was no guarantee that Samsung would regain its competitiveness simply by maintaining its production capability in Korea and overseas and without creating a ‘difficult-to-imitate’ capability. This capability was necessary to survive in an era of increasing global competition and the emergence of the regional trading blocs of NAFTA and the European Union. This caused Samsung to change its strategies, adopting the two important guidelines of ‘globalisation’ and ‘multi-faceted integration’. These were driven by the ‘new management’ movement in 1993, and led to the rapid establishment of international production networks in China. These networks were strategically designed to incorporate close cooperation with affiliated companies so that Samsung could quickly establish several manufacturing plants producing end-products as well as components. After the 1993 organisational reform, cooperation between Samsung’s affiliated firms improved significantly and this was an important means whereby the firm started to regain its international competitiveness.

Operational behaviour and competitive advantage of foreign subsidiaries in the ASEAN region and China

To improve the production capability of the subsidiaries, many local employees were dispatched to Korea for training. Samsung’s headquarters became an important source for the development of the subsidiaries’ production capability. In Southeast Asia, the plant utilisation ratio was in general low in the early stages of operation because production capability improved only slowly. In contrast, the China-based subsidiaries quickly achieved optimal utilisation of plant capacity. This is one indication of the difference between Samsung’s technological capabilities in the two regions. An important aspect of this difference was that Samsung established joint ventures with local firms previously operating in the field of electronics manufacture in China, but this was not the case for most of its Southeast Asian subsidiaries.
Samsung's end-product subsidiaries purchase many of their components from affiliated companies which produce standardised components, achieving economies of scale. The international competitiveness of Samsung's component suppliers derives from cooperation with mainly Japanese subsidiaries operating in the region; for instance, Japanese CTV subsidiaries purchase a great number of components from Samsung's component suppliers. Unlike Samsung's end-product subsidiaries, component subsidiaries have grown substantially since they do business with both non-Samsung production networks and Samsung networks in NAFTA and the EU.

Most of Samsung's end-products made in Southeast Asia are sold on the global market, but distribution to the local market has grown rapidly since the mid 1990s. Samsung has expanded more aggressively into the local markets as their importance has grown. In China and the ASEAN region, Samsung now sells a considerably large share of its end-products on the local markets, while distributing its products globally.

Because of the centralised nature of the relationship between headquarters and the subsidiaries, Samsung's subsidiaries in ASEAN and China have yet to establish independent design and product development capacity. Samsung's headquarters undertake even minor product changes for subsidiaries in the region because of their weakness in design and product modification. It was only after 1993 that Samsung started to carry out R&D investment in the region, while the Japanese MNCs developed their regional R&D capacity more rapidly.

The competitiveness of Samsung's end-product subsidiaries has largely been dependent on the supply of low cost standardised components from affiliated suppliers rather than as a result of strengths in design, product adaptation and development. It is not a reflection of close coordination between different business functions such as production, marketing and design and product development. These are classified as 'difficult-to-imitate technological capabilities', and Samsung had not placed priority on the development of these capabilities after 1969. There were two main reasons why these capabilities needed to be improved. The first was that Samsung's strength in producing standardised low end-products was not sufficient to maintain its international competitive advantage due to
changes in the market, the growing importance of local markets in the ASEAN region and China and rapidly changing markets in the United States and Europe. The second was that established MNCs producing products similar to those of Samsung in the region had established regional R&D bases. As a result, their design and product development capabilities improved rapidly, and they were able to coordinate different business functions within or near their production bases (see Chapters 6 and 7).

The story of Samsung — as a representative of new MNCs in general and of major Korean electronics firms in particular — suggests a number of general conclusions.

• A firm’s competitive advantage stems not only from low cost production but also from the development of its technological capabilities. Technological capabilities must be continually improved to maintain a competitive edge.

• Technological capabilities are important sources of competitive advantage. They embrace a firm’s key functional activities (production, procurement, marketing and R&D), its organisational and managerial capacity, as well as its international management capability. The acquisition and improvement of firm-specific technological capabilities require close coordination and interaction. Unlike established MNCs, the technological capabilities of new MNCs, specifically major Korean electronics firms, tend to be weak in product change, international marketing and management.

• FDI by Korean electronics firms in Southeast Asia and China was undertaken as Korea’s locational advantage declined, while at the same time, the locational advantage of the host countries increased. These advantages included low-cost labour and increasing local and regional market demand. The ownership advantage of Korean firms is their mass production capability — an ‘easy-to-imitate’ technological capability.

• As the world electronics industry has been exposed to global competition, the competitive position of Korean electronics firms has been challenged, mostly by technologically strong global players. From the late 1980s to the mid 1990s, Korean
electronics firms were forced to compete with established MNCs in global markets because both parties started to produce similar product lines in the same markets.

- The overseas production activities of Korean electronics firms still lag behind their Japanese counterparts in the developing countries of Southeast Asia. Korean firms were originally slow to engage in international production, but they are now rapidly catching up with Japan and have developed a fairly sophisticated regional division of labour.

- Korean component subsidiaries supply a surprisingly large share of the parts and components they produce in Southeast Asia and China to non-Korean firms, particularly Japanese affiliates operating in the region. Unlike the Japanese international production affiliates, at least until the late 1980s, Korean affiliates in the region have been open to transactions with outsiders right from the beginning. In other words, they are not as dependent on Korean firms as were their Japanese counterparts on the Japanese affiliates in the region. The openness of the transactions of Korean affiliates in the region was due to their lack of technological monopoly, in contrast to the earlier technological monopoly held by established MNCs.

- The overseas subsidiaries of Korean electronics firms are weak in design and development capability. This is in contrast to that of established MNCs which have increasingly established design, research and product development bases in the ASEAN region and China in order to upgrade their product change capability.

**Changing motivations of new MNCs in international production**

The experience of Samsung indicates that foreign direct investment by new MNCs distributing a large share of standardised products to export markets is critically affected by changes in three factors: the international trade environment; factor costs; and the strategies of competitors. A point particular to a new MNC is that its 'small and temporary' firm-specific advantage — weak technological capabilities relative to established MNCs — is a key factor determining its strategic behaviour.
In the early to mid 1980s, Korean electronics companies first engaged in investment in industrialised countries that imported a large share of Korean TV sets. This was tariff-jumping FDI such as the investment made in the United States and Europe, motivated by the anticipated erection of trade barriers and stimulated by an oligopolistically competitive domestic market when the market leader moved to the United States and Europe. The decision to undertake FDI was made by Goldstar and Samsung because they enjoyed a firm-specific advantage in CTV production through trading off high labour costs in the host country with low cost Korean components. However, the Korean subsidiaries failed to maintain their international competitiveness in the long run. Their competitiveness was based on easy-to-imitate advantage — mass production capability — and this was the most important factor explaining Samsung’s and Goldstar’s withdrawal from their investment in the United States from the late 1980s, in stark contrast to their Japanese counterparts which continued production in the United States until the mid 1990s (see Choi and Kenney 1995).

In the late 1980s to early 1990s, Korean electronics firms moved into the low labour cost economies in the ASEAN region: Indonesia, Malaysia and Thailand. The major motivation for this FDI was the increasing cost of home-based production due to the appreciation of the won and the increasing cost of Korean labour, coupled with the declining cost of foreign production due to low labour costs. To establish low cost supply bases was essential for Korean firms to produce goods for export, mainly to the international market, because foreign subsidiaries in the United States and Europe did not serve local markets well (see Chapter 4).

As the locational advantage of Korea shifted to Southeast Asia, accompanied by changes in the global market, FDI by Korean firms was further developed. Following the establishment of plants for consumer electronics goods, major Korean component manufacturers began production near the assembly plants in the ASEAN region. One motivation for their investment was to produce cheaper components for sale to Japanese and Korean end-product manufacturers in the region. Their interest was also a response to the formation of AFTA. Korean investors located plants in the ASEAN region with
the best locational advantages so that they could concentrate their component production in one or two countries and supply components to other countries in the ASEAN region.

During the 1990s, another location advantageous to Korean electronics firms was China, which provided a low-cost supply base with abundant cheap labour as well as having a large potential local market. After the normalisation of diplomatic relations between the Republic of Korea and China in 1992, FDI by Korean electronics firms increased dramatically. The twin objectives were to establish a low cost production base for the global market and to distribute locally made consumer electronics goods to the Chinese market (see Chapter 7). At the same time, FDI by component manufacturers speeded up, linking assemblers and component manufacturers. This was in contrast to the experience in the ASEAN region (see Chapter 6 and 7). There were two reasons behind the rapid move into China. The first was that globalisation was regarded as a crucial strategy by major Korean electronics firms seeking to regain their declining international competitive advantage. The second was that international management capability, which was not well established at the time of FDI in Southeast Asia, improved significantly although it remained weak relative to that of Japanese MNCs.

From mid 1995, another change taking place in the ASEAN region was that Korean end-product subsidiaries expanded their plant for the production of consumer electronics goods for local markets. The motivation behind this FDI was that local demand increased in the ASEAN region. This also occurred in China as the domestic market was opened more widely to foreign producers there.

**Elements determining the success or failure of international production for new MNCs**

Firms from developing countries that have been successful in achieving international competitiveness in the export stage of production in their home country often fail to survive when they go into international production in industrialised countries.\(^1\) Failure

\(^1\) In the early 1990s Samsung and Goldstar, which had been internationally competitive until the late 1980s, closed their CTV manufacturing plants in New Jersey and Alabama in the US (Choi and Kenny 1995). In 1993 Hyundai Motors closed its automobile manufacturing plant in Canada (*Wall Street*
in international production by new MNCs reflects the weak nature of their technological capabilities, a small and temporary ownership advantage, which can evaporate quickly when the competitive environment changes. Samsung’s case reveals that the requirement for maintaining a global competitive edge has shifted from mass production capability to product change capability. This is a result of the need for firms to meet changing customers’ needs both globally and locally. As global competition has accelerated, Korean electronics firms have been forced to compete with Japanese, American and European MNCs, technologically strong players operating in the same host countries (see Chapters 6 and 7).

Four factors are relevant to the success or failure in international production by a new MNC.

Firstly, the faster production capability in a specific location is learned, the better the growth performance of a foreign subsidiary. Given the fact that production capability only confers a small and temporary advantage, the timing of the exploitation of that advantage is critical. If capability learning and transfer is tardy, the advantage can evaporate. Shortening the learning process is all the more important when the capability gap between competitors narrows. Overall, the Chinese subsidiaries outperformed Samsung’s Southeast Asian subsidiaries; the former succeeded in producing end-products and components while the latter succeeded only in producing components (see Chapters 6 and 7). More specifically, the Chinese CTV subsidiary outperformed Samsung’s Thailand CTV subsidiary. The learning of production capability by the Chinese subsidiaries was faster than that of Samsung’s Southeast Asian subsidiaries because Samsung’s new management movement under which top management pushed affiliated firms to undertake rapid internationalisation, particularly after 1993 and because China’s partners had a strong resource base in related activities.

Journal, 4 March 1994), although the company had gained international competitiveness through its exports from Korea. Most Taiwanese firms that have invested in Europe and the United States have failed. In 1991 Acer’s microcomputer manufacturing in the United States experienced heavy losses; so did the state-owned Singapore Technology Holdings Corporation which made wafers for integrated circuits in the US in 1992 (Hu 1995:85).
Secondly, an end-product subsidiary that links quickly with local component suppliers outperforms one that does not. There are many benefits in the purchase of components near to production subsidiaries: transportation and warehouse costs can be reduced; a JIT (Just in Time) production system can be introduced due to the short delivery time; it is easier to respond to demands for product modification and development and the risk of adverse effects of changes in the host government’s tariff policy is removed. The Thailand-based CTV plant was not able to utilise its assembly plant optimally due to the weakness of its links with SEM Thailand and SED Malaysia, core component producers, in the early stage of operations (see Chapter 6). In contrast, the China-based VCR and CTV plants were able to utilise their plant capacity maximally, quickly linking with local affiliated and/or non-affiliated component suppliers (see Chapter 7). One of the main reasons that international production by Samsung and Goldstar in the United States was unsuccessful was their failure to establish links with local component suppliers in good time (see Chapter 4).

Thirdly, the more proficient the international management capability gained through interaction in a foreign locations with similar characteristics, the better is the performance of subsidiaries. Technological capabilities gained within a certain country need modification and adaptation when applied to a different country because country-specific factors such as the labour market, culture, skill levels and tastes are not identical. There is evidence to demonstrate this point: Samsung and Goldstar moved to the United States with little international production experience and eventually withdrew their investment (see Chapter 4), while Matsushita moved to the United States with experience gained in a country near the United States and is still operating there (see Chapter 4 and Choi and Kenney 1995). Japanese subsidiaries operating in the ASEAN region outperform their Korean counterparts partly because the international management capability of Japanese firms in Southeast Asia superior to that of Korean firms (see Chapter 6). A comparison of the early stage of Samsung’s operations in the ASEAN region with that in China, shows that the Chinese subsidiaries have generally outperformed the ASEAN subsidiaries. The better performance by the Chinese subsidiaries is due partly to Samsung’s improved international operation capability, which also benefited from prior experience in Southeast Asia.
Finally, foreign subsidiaries with superior product change capability outperform those with an inferior capability. This is because market conditions are not static but dynamic. As product life cycles and consumer preferences change continuously, so products need to change accordingly. Comparison between Japanese and Korean firms in the United States in Chapter 4 provides evidence relevant to this point. Matsushita’s US CTV plant was successful in introducing high end-products to US customers because it entered the United States market with relatively high product change capability. In contrast, Samsung and Goldstar’s CTV plants failed to introduce products relevant to US customers’ preferences because both companies had only limited capability in design and product development at the time they established CTV plants in the United States. In Southeast Asia, Matsushita’s Malaysian CTV plant outperformed Samsung’s CTV plant in Thailand. The former’s product change capability was superior to that of the latter, although both were established at about the same time, in the late 1980s (see Chapter 6).

Samsung’s firm-specific advantage in Southeast Asia and China is its mass production capability in the manufacture of standardised products. The growth rates of the end-product and component subsidiaries differed: end-product subsidiaries did not utilise their plant capacity maximally, while the component subsidiaries made optimal use of their plants, achieving economies of scale. The high growth of component manufacturers was due to two factors. The first was that component subsidiaries were able to specialise in low end standardised products that were not generally manufactured by Japanese competitors; this point did not apply to the end-product subsidiaries. The second was that most of the component subsidiaries were wholly owned firms so that the speed of capability learning and exploitation was greater than that of end-product subsidiaries, which are all joint venture companies.

From the viewpoint of the subsidiaries of new MNCS in Southeast Asia and China, what is a desirable innovation strategy to cope with increasing global competition? Given the fact that the global competitive environment is a mixture of capability-based and cost-based competition, if a new MNC focuses on short-term cost minimising efforts without improving its technological capabilities, it is difficult to achieve long-term competitiveness. The case of Samsung suggests that foreign subsidiaries operating in
developing East Asian countries should at least upgrade their product and process change capability, allowing for a flexible response to changes in local and international markets and to the R&D strategies by established MNCs. Given the current competitive environment in the region, capability in product adaptation and differentiation is essential for the maintenance of international competitiveness. Thus, it is desirable for a new MNC to decentralise or internationalise headquarters’ R&D activities.

**FDI policies and technology diffusion of developing countries in the Asia Pacific region**

Samsung’s rapid growth in the 1980s (see Chapter 4) was one of the foundations of Korea’s high economic development during the period. The Samsung case suggests that growth was based on the achievement of cost efficiencies through economies of scale, largely due to an export oriented strategy.

Cost efficiencies were achieved in two ways. The first was dynamic production capability. The capability gained from the production of black and white TV sets during the 1970s was applied to the manufacture of CTVs, and later to microwave ovens and VCRs, mainly through mass production capability. Foreign technology licences provided firms with up-to-date techniques useful for efficient production. The second is OEM. Through OEM, manufacturers saved on the capital investment which would have been necessary for the establishment of their own international marketing channels and R&D investment.

A key to the continual improvement of Samsung’s production capability was the intensive training of shop-front technicians, regardless of whether they were located in-house or overseas. New skills and techniques, that is ‘easy-to-imitate’ capability, could be learnt and improved through training, and these were applied to the manufacture of more technologically advanced products (see Chapters 3 and 4). Samsung’s case supports Kim’s argument (1990: 156) that without training and human resource development, Korea’s economic development would have been much retarded.
Samsung’s declining international competitive advantage between 1989 and 1992 indicates that it lacked ‘difficult-to-imitate’ capabilities such as design and development and experience in international operation (see Chapter 5). Although there may be several explanatory factors, it can be argued that Korea’s restrictive policies on inward and outward FDI were one of the major barriers to learning and improving on product change and international management capability.

Kogut and Zander (1993: 637) draw the important lesson that ‘the less codifiable and the harder to teach is the technology, the more likely the transfer will be to wholly-owned operations’. Because of this, a firm with a difficult-to-imitate capability prefers wholly-owned subsidiaries to joint ventures. The restriction of inward foreign investment flow by Korea (Lall 1990: 13) tended to discourage foreign companies from setting up wholly-owned subsidiaries, while encouraging joint ventures. This restrictive FDI policy deprived Korean firms of the chance to learn and improve on design and product development capability from foreign firms operating in Korea. At the firm level, the lack of product change capability remains as great a constraint on Samsung’s growth in the 1990s as it was during the 1970s and the 1980s (see Chapter 5). OEM is one of the major factors that led Samsung to neglect improvement in design and product development (see Chapters 4 and 5). At a national level, Korea’s restrictive inward FDI policy deterred Korea from the development of country-specific technological capabilities necessary to maintain the nation’s dynamic comparative advantage.

Another impediment to Korean firms’ acquisition of international management capability was Korea’s restrictive outward FDI policy. Given that a new MNC has a small and temporary advantage compared with that of established MNCs, a new MNC needs to exploit its advantage rapidly whenever it occurs. This is because ‘competition among firms is based upon their differential capabilities, and their abilities to expand by the creation and replication of new knowledge faster than the imitative and innovation efforts of competitors’ (Kogut and Zander 1993).

One of the major reasons for the decline in the growth of major Korean electronics firms in the 1990s was the bottleneck which developed in capability learning and transfer
between headquarters and the Southeast Asian subsidiaries (see Chapter 6; Ernst 1994b). Tardy internationalisation by Korean electronics firms was also a result of the government’s regulatory FDI policy. It was not until 1986 that government regulations on Korea’s outward FDI began to be relaxed (see Ryou and Song 1993: 4), but gaining a foreign investment permit was still not easy because of the complicated formalities required. While Japanese firms rushed to establish low cost export production bases in Southeast Asia soon after the 1985 Plaza Accord, it was only in 1989 that Korean firms were able to begin production there (see Chapter 6). In consequence, the mass production capability advantage of the Korean firms was not exploited in low labour cost countries in a timely manner.

A restrictive inward FDI policy can positively encourage indigenous firms to develop their own technological capabilities. However, a lesson from Korea’s policies on inward foreign direct investment is that the restrictive FDI policy in a developing country eventually impedes the development of firm-and country-specific technological capabilities by hindering the acquisition and development of up-to-date technology from foreign firms. This has a negative effect on the maintenance of domestic firms’ international competitive advantage to meet the need for the design and product development capabilities demanded by the forces of international competition. The process of deregulating FDI policy needs to respond quickly to changing competitive environments in order to attract foreign firms that will assist the development of the host countries’ technological capabilities. Given increasing global competition, the faster their inward FDI policy is deregulated, the faster host countries can learn and upgrade their technological capabilities. Similarly, the faster outward FDI policy is deregulated, the more effectively can host countries’ firms maintain international competitiveness because of the timely exploitation of their ownership advantages overseas.

**Concluding remarks**

Looking at the dynamics of a new MNC’s internationalisation provides insights into strategies whereby new MNCs establish a competitive edge in the face of global competition, and policies whereby developing countries can maintain economic growth and technological development in the long run.
Cost reduction and foreign technology acquisition are two of the major motivations for FDI by a new MNC, particularly a technology-intensive manufacturing firm with a large export share and foreign sources of technology. FDI in Southeast Asia and China sought to establish low cost supply bases, under domestic pressure and pressure in the host countries. The FDI strategy of a new MNC varies over time, but gradually evolves to establish regionally integrated production bases as a means of maintaining an internationally competitive position in relation to that of established MNCs.

A new MNC’s strength in FDI initially lies in the production of standardised components through the achievement of economies of scale by utilising its mass production capability. The success or failure of international production depends on whether or not foreign subsidiaries can quickly improve the production capability transferred from headquarters. Another element which determines the rate of growth of a foreign subsidiary is the development of ‘difficult-to-imitate’ technological capability such as product change capability, international management capability and linkages to local component suppliers.

A new MNC’s weakness in product change and international management capability is a major handicap in the maintenance of international competitiveness and is in part attributable to home country policy. Restrictive policies on inward FDI ultimately discouraged wholly-owned foreign subsidiaries from operating in Korea. This prevented Korean firms from learning difficult-to-imitate technological capabilities in design and product development skills, for example. Korea’s regulation of outward FDI policy also discouraged firms from investing overseas, and ultimately inhibited domestic firms from gaining international production experience. This carries the important policy lesson for developing countries that a restrictive FDI policy, whether on inward or outward foreign direct investment, deprives domestic firms of the chance to learn difficult-to-imitate capabilities and inhibits the timely exploitation of short-lived advantages in international production given that international market changes rapidly and product change capability is more important in the face of global competition.
Limitations of the study and future research directions

The study includes consideration of international business, strategic management and technological and organisational learning issues. It provides insights into ways of organising successful international production by new MNCs in the face of global competition. The study has the usual limitations of case studies based on data from a single firm in a particular country. Although major Korean electronics firms have similar patterns of development and similar problems in global competition, the findings may not be easily extended to other Korean MNCs or to new MNCs from other countries.

Because of lack of data, it was not possible to compare systematically the performance of Samsung and a Japanese MNC, or to make comparisons between Samsung’s operations in China and Southeast Asia. The performance of subsidiaries is measured by plant utilisation ratio without consideration of other factors. Samsung’s CTV plant is compared with Japan’s Matsushita CTV plant despite the fact that the former is located in Thailand whereas the latter is located in Malaysia. Similarly, Samsung’s performance in China is not compared with that of Japanese MNCs, but with Samsung’s subsidiaries in ASEAN. These limitations affect the strength of the conclusions that are able to be drawn.

An additional limitation is that it was not possible to evaluate fully the results of the 1993 Samsung’s new management movement. The evaluation of Samsung’s experience is based on interviews and the growth performance of Samsung’s subsidiaries in ASEAN and China.

There is an expanding macro-level literature on the spread of newly industrialised countries’ investment to ASEAN and China. However, the micro-level literature is thin, and research related to global competition is rare. One possible direction for future research would be to undertake more case studies and to take a more theoretical approach linking traditional FDI (which is static in character) with the dynamic of involvement of new MNCs in rapidly changing international markets, taking further the theme in this thesis of the key role of technological capability and its international diffusion. This could capitalise on the insights provided by the present study which are
informed by an interest in strategic management, organisational and technological learning. In this way, the findings of this study could be related to more traditional economic theory surrounding foreign direct investment. The development of research in this direction could assist in the development of corporate strategies and national policy perspectives in developing countries. This study provides a stepping stone towards this broader research agenda.
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