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Internationalization and Technological Catching Up of Emerging Multinationals: A Case Study of China's Haier Group

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Internationalization and Technological Catching Up of Emerging Multinationals: A Case Study of China's Haier Group[1]

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Abstract:
In recent years, a number of firms from Asia and Latin America have been internationalizing their businesses to access new markets and to acquire new technology. This follows similar attempts only a few years earlier by leading firms from countries such as Korea and Taiwan. Much research has gone during the last two decades into understanding the success of Korean and Taiwanese firms. In this paper we carry out a case study of the Haier group—one of the most promising global enterprises emerging out of mainland China. We explain the need for recognizing some important differences in the early stages of growth between emerging MNCs today and MNCs from Korea and Taiwan. Unlike firms from the latter countries, globalizing firms of recent times during their early years of existence had little incentives to improve their technological competence. Furthermore, they generally had a one-off relationship with international technology suppliers that further prevented the regular upgrading of their technological base. Nevertheless these firms have shown themselves to be adept in facing up to the challenges of globalization by adopting innovative technological and business strategies. What are the distinctive features of these strategies? How useful are these strategies for long-run growth? What lessons can other firms and governments learn from these experiences? We hope to offer some preliminary answers to these important questions. Case studies like ours can also contribute towards developing newer frameworks for a better understanding of the internationalization of businesses in modern times.

JEL codes: L24, L25, O19, O32, M13
Key words: emerging MNCs, internationalization, technology strategies, alliances, technological catching up, Haier group, China.

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1. Introduction

The last two decades have witnessed the emergence of a growing number of multinational companies (MNCs) from many of today's newly industrializing countries such as China, India, Mexico, Malaysia and Russia. They operate in an increasingly integrated global economy which is quite unlike the world economy during the 'late' industrialization episodes in Taiwan and South Korea (Korea hereafter) during the 1960 and 1970s. The latter countries followed a combination of the strategies of import substituting industrialization (ISI) and export oriented industrialization (EOI). Such a policy framework established a 'carrot and stick' incentive structure in which enterprises experienced both the luxury of domestic protection and the pressure to succeed in competitive foreign markets. Domestic protection, together with state support, also helped them access foreign technology on favorable terms (Amsden, 1989).In contrast, emerging MNCs today experience intense competition in their home markets, and this has driven many of them to compete in markets abroad. Furthermore, globalization has reduced governments' ability to control technology transfer through not only trade policy but also 'contract bargaining' with foreign firms on behalf of domestic firms. This means that emerging MNCs today need to devise novel strategies to learn 'dynamically' through continuous access of foreign technology (as opposed to a one-off import of technology), as well as markets (Radosevic, 1999).

It is well known that late comer firms enjoy certain advantages for catching up because of their technological 'backwardness' (e.g. Gerschenkron, 1962; Abramovitz, 1986). Over the past two decades an increasing number of studies have examined the successful catching up of latecomer firms in East Asia (e.g: Kim,1980; Amsden, 1989; Dahlman, 1994; Wu 1995; Hobday, 1996; Felipe, 2000; Mathews, 2001). A common theme of these studies has been their attempt to explain the so-called "East Asian Miracle" (World Bank 1993). A majority of these studies has taken on a policy level perspective and has focused on the role of institutions and governments in the catching-up processes. Others have examined the individual technology sourcing strategies of latecomer firms that were able to catch up technologically with their Western competitors.(Dahlman and Sananikone,1990; Bloom, 1992; Mckendrick, 1992; Dahlman, and Sananikone.1993; Hobday, 1995; Kim, 1995, 1997; Kim, 1998; Chen, 1999; Lim, 1999; Choung, et al.2000).

In the literature cited above, the conceptual and theoretical frameworks developed regarding the internationalization of MNCs pertain largely to the period prior to the 1990s. These studies, while providing useful benchmarks, cannot fully explain the distinctive approaches to internationalization and building up of international R&D capabilities by MNCs that have begun to emerge since then from countries such as China and India.

In this paper we examine the internationalization and technology strategies of the Haier Group (Haier hereafter) of China. We will argue that Chinese, as well as Indian, firms grew differently from Korean and Taiwanese firms in the early stages of their development. By studying Haier we hope to draw some distinctive lessons about the internationalization strategies of firms from emerging economies like China and India. In this process we will examine how has Haier achieved its transition from being a small national entity producing for local markets using borrowed technology, to being a large MNC that makes higher-end products (developed through its own design, branding and marketing capabilities) and sells its technology. We will bring out the important role played by the firm's internal technological efforts, alliances with foreign firms, creation of product niches, diversification strategies, and acquisitions of foreign firms and brands. We will also explore the significance of the

institutional support the firm has been receiving to draw lessons for policy makers in other less developed countries.

We start by noting in the following section the need for moving away from traditional frameworks for understanding the process of internationalization in recent times. First we look at the growing significance of diversification for successful internationalization strategies. Second, we distinguish the initial growth circumstances of firms from Korea and Taiwan on the one hand and China and India on the other. We conclude this section by pointing out the major advantages offered by internationalization to late comer firms. In section three, we carryout a detailed examination of the Haier Group and the group's internationalization strategies. The final section discusses the key features of Haier's internationalization strategies in the wider context of globalization, the changing role of the state and the internationalization efforts of other firms from less developed countries.

2. Towards understanding the internationalization strategies of emerging MNCs

The conventional frameworks for analyzing the internationalization activities of MNCs are not very useful in explaining the internationalization strategies of firms from emerging economies. For example, the ownership-location-internalization (OLI) theory á la Dunning (1981, 1988) is based on the successfully internationalized, predominantly Anglo-American firms. A central characteristic of these firms was their repository of proprietary technologies and brands.[6]

However, emerging MNCs have no or very little proprietary technologies or brands to start with.[7] Internationalization therefore has become a necessary means to *capture* ownership advantages, through acquisition of foreign technological knowledge. We can thus characterize the evolution of today's late comer firms as one of evolving from *locational advantage* to adopting *internationalization* to achieve, among others, *ownership advantages* (of brands and technology).[8]

Internationalization today also has other important differences with internationalization in the past. First the motives underlying internationalization have changed. And second, key differences exist with regard to the initial phases of growth between internationalizing firms today from China and India on the one hand and MNCs from Korea and Taiwan on the other.

2.1 Diversification and value creation: a shift from the past

There are important differences in both the moves for and the path to internationalization between late comers today and their Western counter parts in the past. As Smyth (2000) notes, "Chandlerian firms which emerged in Europe and the United States from the second industrial revolution first specialized in producing a narrow product line based on *core competences* and then diversified into related industries" (emphasize added). Part of the reason for internationalization of these firms, in a narrow band of products, was to exploit economies of

[6] The OLI framework views internationalization as a firm's attempt to exploit its *ownership* advantages by extending its proprietary assets abroad. This involves first, exploiting *locational* advantages of producing abroad, and second, integrating the firm's activities across borders to tap the advantages of economies of scale and scope. The latter ensures that the firm has *internalized* its ownership advantages—rather than sell its products or technologies to a foreign firm. For a critique of the application of this approach to emerging MNCs, see Bonaglia, Goldstein, Mathews (2007).

[7] By definition, ``late industrialization is a process devoid of innovation" (Amsden, 1992).

[8] India's Tata group's acquisition of Land Rover and Jaguar from Ford perhaps exemplifies this pattern.

scale and scope. Today's emerging MNCs by contrast *diversify to create value* to compensate for the absence of core competences.

In modern industries, economies of scale and scope are not any more important than creating knowledge and enhancing learning (Chandler and Hikino, 1997). Emerging MNEs thus do not wait to become large to diversify or to internationalize, rather they internationalize *and* diversify. Rapid diversification and enterprise expansion (for example into multi-product business groups, like *Chaebols* in Korea) offer these late comers certain advantages in their internationalization process. One of the important advantages offered by diversification is that it allows the enterprise group as a whole to leverage the *reputations* built up through honest dealings in the past (Khanna and Palepu, 1997). They can also point to their track record and returns to foreign investors. Diversified groups thus can far more easily secure external financing, as well as foreign technology, for new ventures than enterprises with a more narrow focus.

Diversification and internationalization appear to have gone hand in hand for MNCs that emerged during the 1960s and 1970s in Korea and Taiwan, and for MNCs that have begun to emerge in recent times from China and India. However, the two groups of enterprises do not share a common history of early growth. Below we highlight some of these key differences, which we believe need to be recognized from the perspective of our study.

2.2. Path to internationalization: the diversity of initial circumstances

In recent years, the shift-away from ISI strategies in most of world's protected economies has transformed the way enterprises from these countries do business. Under ISI, these enterprises had experienced certain locational advantages on account of little or no competition from foreign firms. However, falling tariff and foreign investment barriers has increased competition and brought down profit margins in local markets. The result, from Asia to Latin America, has been a shift in focus towards internationalization of business (see for example, Cuervo-Cazurra, 2008; Chittoor, et al, 2008). The initial approach to internationalize was by increasing the share of exports in total sales. However, with foreign MNCs starting to operate in local markets, these enterprises have realized the need for moving away from cost-based comparative advantage to technology-based competitive advantage. Like catching up firms before them, in the West and in East Asia, they have focused on acquiring existing technology from abroad, and combining that with the locational advantages of the home market. Thus a growing number of enterprises are resorting to overseas acquisitions and strategic alliances to acquire new brands, technological assets and other sources of competitive advantage that expand and diversify their competence base (Bonaglia, Goldstein, Mathews, 2007).

However, while these firms can be expected to benefit from their well known late comer advantages (which we discuss in the following section) the position of Chinese and Indian firms is somewhat unique compared to the Korean and Taiwanese late comer firms. The latter, from an early age, had a significant exposure to international markets. Many of them started off as Original Equipment Manufacturers (OEMs) for established MNCs before transitioning to Original Design Manufacturers (ODM) and finally to Original Brand Manufacturers (OBM). They were thus able to leverage their access to knowledge and markets from their initial positions to establish themselves on the world stage (Hobday, 1995). However because of the extreme nature of ISI in their countries Chinese and Indian firms often controlled the entire value chain of mainly low-end products. Internationalization

strategies of these firms therefore can be expected to take a different course compared to what we know from the experience of Korean or Taiwanese firms.

2.3 Late-comer advantages

What are the potential advantages which late comers could exploit in their internationalization efforts? This is especially an important question in the current international business environment in which established MNCs too are carrying out extensive internationalization of their businesses.

First, latecomer firms have the speed and *flexibility* to enter into new resource spaces fast. They are not bothered by sunk costs and other inertial pressures as in the case of incumbent firms. As noted by Mathews (1999) “the distinguished feature of the latecomer firm is its preparedness, and its ability to learn; it is a learning organization 'par excellence'”. Until recently, late comer firms also had the advantages associated with the low cost of production inputs (e.g. materials and labor) and the fact that they were shielded from foreign competition by their governments. As earlier discussed, many of today’s emerging MNCs have enjoyed such benefits.

Another advantage the emerging MNCs have is that instead of building their business model from scratch, they can adapt the business models of their competitors. For example, emerging MNCs can benchmark their business against established MNCs and then maneuver around them by exploiting *niches* that the established companies have overlooked. Established MNCs are often characterized by a strong inertia which prevents them from transforming their current products and technologies. This so-called ‘success breeds failure syndrome' (Starbuck, Greve and Hedberg, 1978) is often observed by industry leaders. Newcomer firms, in contrast, can change the rules of the game by introducing innovative and risky business models, capitalizing on the inflexibilities in the business models of established MNCs (Bartlett and Ghosal, 2000).

As part of their internationalization efforts, emerging MNCs are increasingly resorting to strategic (technology) alliances, joint ventures, and mergers & acquisitions. These range of cross-border alliances are aimed at both access to new markets and climbing the global technology ladder. Thus technological and product diversification strategies have become heavily intertwined under the internationalization strategies of firms (Cantwell and Piscitello, 1999). Emerging MNCs have shown to master this process quite well.

Emerging MNCs can also benefit from yet another well known advantage of new comer firms: *knowledge spillovers*. Knowledge spillovers are non-pecuniary externalities that depend on face-to-face interactions between active researchers, and are expected to be highly localized and to decay rapidly with distance (Rosenthal and Strange, 2003). Theories of industrial clustering and new economic geography stress the importance of local knowledge spillovers “because technical knowledge has imperfect proprietary rights and because geographic proximity provides an advantage for observation, interaction, collaboration, and inquiry” (Aharonson, Baum, Feldman, 2007). Evidence points to emerging MNCs strategically locating their research and design centres, in addition to production units, in advanced economies.

In the following we conduct a case study of the Haier Group, one of the biggest emerging MNCs from China. We hope this study will offer insights into aspects of internationalization and technological catching up in the 21st century.

3. Technology strategies for successful internationalization: a case study of the Haier Group

The Haier Group is the single largest maker of comprehensive household appliances in China. In 1984 Qingdao Refrigerator plant, which was renamed Haier group in 1992, was close to bankruptcy. The company's turn around began with the appointment in the same year of Zhang Ruimin, who currently is the CEO of Haier, as the plant director (Liu and Li, 2002).[9] At that time its sales were a mere RMB1 3.48 million and it faced a debt of RMB 1.47 million. By 2007, however, Haier's global sales had reached RMB 118 billion and it employed about 50,000 people worldwide. At first, Haier only produced one specific kind of household refrigerator—the BCD-212. Today, it manufactures a very broad range of household appliances: 15,100 product varieties in 96 product lines. In 2003, the Haier brand topped all Chinese trademarks in a nationwide survey. The Chinese Fortune magazine (issue 8/2004) rated Haier the second in their list of most admired companies in China. In this rating Haier was perceived as number one in the fields of management performance, innovation capability and social responsibility. In 2004, Haier was recognized as one of the World's 100 Most Recognizable Brands in a global name brand list edited by the World Brand Laboratory[10]. According to 2006 Euromonitor statistics on company sales, Haier has the largest world market brand share for refrigerators, and it is the fourth among the global white goods manufacturers. Between 2003 and 2006, Haier ranked first in terms of overall leadership among mainland Chinese companies in the *Wall Street Journal Asia's* annual survey of Asia's 200 Most Admired Companies. In 2008, Haier ranked 13th on *Forbes*' Reputation Institute Global 200 list. Also in the same year, Haier ranked first among Chinese enterprises on the Financial Times list of the most respected global companies.

These figures and rankings indicate that over a period of two decades, Haier has grown from being a small, almost bankrupt enterprise to being one of the leading household appliances makers in the world. In this paper we will show that an ambitious strategy of technological internationalization, involving a reorganization of in-house technological efforts, setting up of global design houses, strategic alliances and technology co-operations with leading global firms, and acquisition of foreign companies and plants—all in tandem with an intensive diversification and foreign-market access strategy—played an instrumental role in Haier's progress to its leading position today.

[9] The ownership structure of Haier is opaque, however. The company calls itself a "collective", purportedly owed by workers who, however, receive no dividends (Newsweek, May 19, 2005). While about 30% of Haier's assets are traded in Hong Kong and Shanghai stock exchanges, the company is believed to be de facto state owned (WSJ, Mar 19, 2008). As we will discuss later, the central and local governments have a significant influence on the operations of the company.

[10] World Brand Laboratory is one of the five leading brand evaluation organizations in the world.

3.1 Early years

The first step in the development of Haier's technological catching up process was taken in 1984 when Haier decided to acquire from abroad a new refrigerator technology. After a careful evaluation of 32 potential cooperative partners, Haier decided to establish an alliance with the Liebherr Company of Germany. This move enabled Haier to import Liebherr's four-star refrigerator production technology and equipment to China. Liebherr had 70 years of experience in producing high quality refrigerators. Its refrigerators were generally regarded as the leading ones in the world. Compared to Liebherr's refrigerators with four-star technology, Chinese products featured the very old-fashioned two-star technologies with a freezing capability of -12 degrees Celsius. The freezing capability of a four-star refrigerator was -18 degrees Celsius. By acquiring four-star refrigerator technology, Haier became the only Chinese company that was able to offer this modern refrigerator in China.

Haier followed up the licensing of Liebherr' four-star technology with an active learning and R&D strategy. It established a sophisticated R&D department, and sent more than 40 of its top engineers and managers to Liebherr for training. Liebherr proved to be a very successful training institute for Haier's top R&D talents. They studied the development of four-star refrigerators, and eventually mastered the key technological skills required for developing advanced refrigerators. In 1985, a year after it licensed Liebherr's technology, Haier was able to introduce its first four-star refrigerator in the Chinese market. This product instantly established Haier as the leading refrigerator producer in China.

3.2 Internationalization Strategies

Quest for global markets and a new focus on quality

Globalization and the increasing interconnectedness of the world economy since the late 1980s marked a watershed in the history of Haier. The company foresaw the looming competitive threat from foreign firms in a hitherto (largely) insulated domestic market. The top management of Haier quickly realized that under the new rules of the game, the company could no longer remain competitive based solely on cost considerations and that it needed to be competitive based on quality. Haier thus envisioned a strategic shift in the company's focus from Chinese market to foreign markets. Towards becoming a globally leading enterprise the company set the goal of elevating its product quality to be amongst the best in the world. It thus launched a drive to improving quality, service, design, and technological capability. For some time, Japanese household appliances were considered to be amongst the highest quality products in the world. Haier however decided to set even higher quality standards than the stringent Japanese Industrial Standards (JIS)—the quality standards applied in Japan. According to JIS, the return-repaired ratio of refrigerators should be less than 0.6%. Haier's international standard was set at below 0.4%. The average life of Haier refrigerator was 15 years (the longest life of all refrigerators in the world). In 1988 Haier was awarded China's National Quality Gold Medal, the first such award in China's refrigerator industry. In 1990, Haier's refrigerators passed the American UL certification. Since then, Haier successively passed, among others, ISO9001 certification, ISO14001 environment system certification, the European CE certification, the Canadian CSA certification, the German VED and GS certification, the Japanese S certification, and the Australian SAA certification. Meeting international quality standards allowed Haier to introduce its products into developed country markets.

Inspired by Japanese TQC management and Frederick W. Taylor's scientific management, Haier also started to use the OEC (Overall every control and clear) model. The OEC model implies that everything should be controlled and cleared within the specific time frame that was set. Today's tasks must be finished today and the problems showing up during the work process must be dealt with immediately and improved at once, after finding out the reasons and responsibility.

Haier made extensive use of the technological and managerial learning from its technology cooperation with Liebherr. It continuously extended its cooperative efforts even after gaining its leadership status in the refrigerator market. This allowed the company to gradually enter into others markets by means of technology alliances.

Diversification, alliances, joint ventures, and acquisitions

In the case of Haier, we notice an intertwining of the strategy of internationalization of technology on the one hand and the strategy of product diversification on the other. Haier's product range expanded rapidly during the 1990s (see table 1, which also shows how foreign partnerships contributed to Haier's diversification), and its technology alliance partners grew from a single partner (Liebherr) to a multitude of partners in a wide range of sectors (table 2 shows some of Haier's major international technology cooperative partners).

Table 1. The process of Haier's diversification

Stage	Period	Additional Operational Area	Method
1	1984-Dec. 1991	Refrigerators	Imported refrigerator technology from Liebherr Company of Germany
2	Dec. 1991-Jul. 1995	Freezers Air-conditioners	Merged Qingdao Freezer General Plant and Qingdao Air-conditioner Plant
3	Jul. 1995-Aug. 1995	Washing machines Microwave ovens Water-heaters	Merged Red Star Electric Appliance Factory. Established a joint venture with Laiyang of Shandong Household Appliance General Plant
4	Sept. 1997-	Black household appliances	Established a joint venture with West Lake of Hangzhou Electric Group
5	1998-	Knowledge sectors	Formed technology cooperation with many external organizations

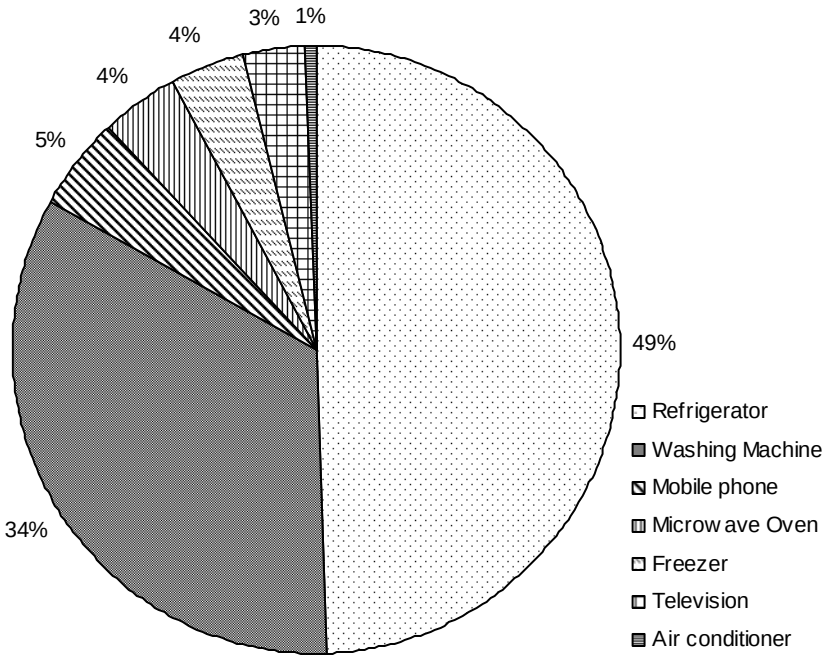
Source: Sun, 2002; Yan and Hu, 2001; www.3rd56.com

Technology alliances proved to be instrumental in Haier's diversification strategy. During 1984-1991, Haier was a single product company focused entirely on refrigerators. In 1991, Haier's sales were RMB 724 million, and profits were RMB 31.2 million. From then on, Haier started to diversify into new product markets ranging from freezers to air-conditioners. It took Haier about three years to successfully establish itself in these two industries. By 1994 Haier's sales had grown to RMB 2.56 billion, and its profits to RMB 200 million. Subsequently Haier successfully developed, among others, washers, microwave ovens and

water-heaters. In August 1997 Haier made its entry into the black household appliances sector; until then Haier's products were primarily white household appliances.

Figure 1 captures the diversification of Haier's technological competence base, which underlie its rapid product diversification, in terms of the number of patent applications in China in different product fields.[11] Refrigerator and washing machine account for bulk of Haier's patent applications in China, and the rest of the patent applications are shared across the remaining categories.

Figure 1: Industry-wide distribution of Haier's patent applications in China: 1992-2007



Source: http://ensearch.sipo.gov.cn

By 1996 Haier had become an exporter of not only its products but also its technologies. Haier made use of its improved technological capability and product diversification to extensively enter into overseas markets by means of *strategic alliances*. Since 1990, Haier's products successively entered into Europe, North America and a large number of other developed countries. Parallelly, Haier established a global network of design, manufacture, distribution and after-sales services.

Leveraging its technological base and product range, Haier has entered into *cooperative research programs* with leading foreign companies. Haier's international technology co-operations span Tokyo, Los Angeles, Montreal, Lyons, Seoul, Sydney and Amsterdam. Its cooperative partners include Toshiba, Mitsubishi, ESS, Philips, Metz and Lucent. These alliances provide Haier with information about global trends in technology development. In addition, teaming up with these globally leading innovative companies serves Haier a *radar function* that has allowed it to scan and evaluate new and emerging technologies around the

[11] The graph is based on a sample of 897 patents of a total of 2,120 patents Haier has applied in China until 2007. We used a key word search of patent titles to find out the number of patents applied for under each product category. This naturally does not fully reflect the complete number of patents under each category because a patent that falls under a given product category may not have the name of the category on its title.

globe. Haier has also established several overseas *design and R&D centres*. These design centres (totaling 15 to date) are in charge of developing a broad variety of household appliances that satisfy consumer needs in a number of countries world wide.[12]

Table 2. Selection of Haier's most important technology alliances

Year	Partner	Cooperative Target
1993	Merlonic Company (Italy)	Produces automatic roll-washers
1993	Mitsubishi Heavy Industry, LTD (Japan_	Produced air-conditioners
1994	GK Design Company (Japan)	Engaged in the cooperative design of new products
1997	Philips (NL) and Metz (Germany)	Produced color TV-set
1998	Beihang University (China) and C-Mold (USA)	Software development
1999	Toshiba (Japan)	Produced MRV inverter series of commercial air-conditioners
2002	Sanyo (Japan) and SAMPO (Taiwan)	R&D

Source: Ouyang, 2003; and Zeng and Zhong, 2003; www.haier.com

Haier has established three overseas industrial parks (in the United States, Pakistan and Jordan) and 30 overseas factories. The company has 58,800 sales agents worldwide, and exports its products to more than 160 countries in Europe, North America, Middle East and Asia. Some of Haier's overseas acquisitions are significant from the point of view of generating knowledge spillovers. For example, in June 2002 Haier purchased a refrigerator factory in Italy, making Haier the first Chinese enterprise to purchase a factory in the European household appliance sector. The factory is located in a geographic area that has a concentration of many top home-appliances makers, such as Whirlpool, Candy and Zanussi. As we discussed in section 2.3, close geographic proximity with incumbent firms create strong potentials for generating *localized knowledge spillovers*. This is in addition to the traditional benefits associated with industrial clusters: labor market pooling and input sharing (Beaudry, 2001).

Haier carries out its globalization strategy according to a *three one-third principle*. Under this, one-third of its products are both produced and sold in its home country, one-third of the products are produced in home country but sold overseas, and one-third of the products are both produced and sold overseas.

With regard to its global expansion, Haier's approach is *from difficulty to ease*, which refers to its strategy of entering tough markets first before moving into easier markets. Entering more advanced markets first, the company hopes, will help it gain greater brand recognition (an essential prerequisite for making inroads in the market for higher-end products). For example, Haier made its entry into the European market through the German market;

[12] Haier has a reputation of targeting niche markets, both abroad and in China. In the US, for example, Haier developed a refrigerator model with a fold-out table aimed at students; this was after product designers who visited cramped dormitory rooms discovered that students put boards across two refrigerators to create a make-shift desk. Likewise, in China, Haier developed a washing machine model that serves the dual purpose of washing clothes and washing vegetables. This model, targeting rural areas, was the result of Haier repairmen reporting back to the company that people in rural China use their washing machines for cleaning vegetables as well (FT, Sept, 24, 2004).

Germany is generally recognized as one of the most difficult markets to penetrate in the European Union. It has entered markets in Asia, such as Indonesia, Philippine, Malaysia, United Arab Emirates and Iran mainly through joint ventures. European and North American markets account for about 60% of Haier's export.

Haier's internationalization efforts are now primarily focused on the United States. For the US market, Haier first started to export compact refrigerators that could easily be shipped from China to the US (WSJ, Mar 19, 2008). Haier initially sold its products through Wal-Mart, but soon wanted to sell higher-end products through major retailers such as Sears and Lowe's. To do that Haier needed to produce them because these were typically larger size appliances that could not be as easily brought in from China.[13] Thus, in 1999, Haier built a factory in Camden, South Carolina with a view to produce these products in the US itself. The new plant has a production capacity of 500,000 refrigerators per year. The company also built a design center in Los Angeles, and a trade center in New York. Currently, with the US economy going through a recession, Haier has even started exporting its higher-end products made in the US to China, targeting affluent consumers. Haier thus has demonstrated its flexibility and adaptability when faced with newer challenges of globalization.

Haier has experienced rapid growth in the US market. Its freezer sales in the United States amounted to just 10,000 in 1997, before climbing to 43,000 in 1999, and by 2006 the company had become the third largest seller of freezer. It is estimated that in the United States the market share of Haier's small refrigerator (less than 180 liter) is currently about 30%. Haier is ranked sixth among all refrigerator companies in the United States. According to the United States APPLIANCE journal, Haier freezer and air-conditioner have moved up into the top ten in the US in sales volume.

Side by side with its product diversification and technology internationalization strategies, Haier implemented a major reorganization of its internal R&D structure.

Reorganization of the internal R&D structure

In the course of Haier's diversification efforts, Haier repeatedly adjusted its R&D organizational structure and increased its R&D spending so that its new products could be brought to the market quicker (table 3). Before 1996, the proportion of Haier's R&D expenditures as a percentage of total sales was about 3%, it subsequently reached 4% in 1997, and climbed to about 5% in the next three years before reaching 6.6% in 2000. Although R&D spending dipped slightly as a percentage of sales (it continued to increase in absolute terms) it bounced back to over 6% during 2005 and 2006 . Significantly, in 2006 70% of Haier's total R&D expenses was on investment in overseas R&D (SCCBD, 2007). Haier's R&D spending appears to match or even exceed industry standards. Table 3 indicates that Haier's spending on R&D as a proportion of sales revenue has been approaching that of Sony and is already higher than GE's.[14]

[13] A major reason why Haier is paying great attention to selling 'mainstream', high-end products is that these products enjoy high profit margins. This is particularly important for Haier because since the mid 1990s its profit margin has been declining due to increasing competition in the Chinese market. Between 1994 and 2007, the profit margin of Qingdao Hair Co., the Haier subsidiary which makes and sells home appliances, declined from 10.4% to 2.2%. Established MNCs, on the other hand, enjoy much higher profit margins. General Electric, for example, had a profit margin of 10-13% over the last few years (own calculation using computstat data)

[14] GE's low percentage share of R&D in sales should be viewed in light of the enormous size of its business, as well as its leadership status in terms of technology. For example, in 2005, Haier's total sales were only 1.2% the sale of GE (Muroi, 2005).

Table 3. R&D spending as a percentage of sales (1997-2006) : A comparison between Haier, General Electric (GE) and Sony

Company	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
Haier	4.0	4.6	4.8	4.8	5.6	4.8	4.3	4.4	6.2	6.2
GE	1.7	1.5	1.5	1.5	1.6	1.7	1.6	1.6	1.8	1.8
Sony	4.7	5.5	5.9	5.7	5.7	5.9	6.9	7.0	7.1	6.6

Source: Liu and Li (2002); SCCBD, 2007; Computstat

After its first diversification efforts in 1991, its R&D lab, formerly known as the refrigerator institute, was split up into three main R&D groups: the refrigerator group, the freezer group and the air-conditioner group. Haier founded a new technology research center in 1995. The center consisted of three main administrative levels. The first level was the corporate group which was responsible for the development of *core technologies and basic research*. The second level was created in every department (business unit). The third one was connected to every plant (cost center).

In 1998, the technology center was split into the technology development institute and the new product development institute. The *technology development institute* composed of 11 institutes and laboratories that aimed to develop leading technologies for international use in 5-10 years. In addition, Haier invested RMB 500 million to build up an academy that was responsible for developing new products that had the capability to be internationally competitive. In 2001 the State Economic & Trade commission of China and the Evaluation Research Center of the Chinese Academy of Science co-evaluated Haier's technology development center and ranked it first among 284 state-judged enterprise technology development centers. The *new product development institute* composed of 14 institutes that developed new products in order to satisfy emerging market needs. It was placed under the technology development institute's guidance.

Haier's organizational structure too has been undergoing changes, geared towards innovation. According to its CEO Zhang Ruimin, Haier follows an increasingly flat organizational structure, which is intended to make "everyone a source of innovation" (Ruimin, 2006). This is exemplified by the introduction of niche products, be it the refrigerator with a fold-out table developed for undergraduate students in the US or the washing machine capable of cleaning vegetables developed for rural China (see footnote 7**Error! Bookmark not defined.**).

4. Discussion and Conclusion

Over the last two and a half decades Haier has transformed itself from being a single-product company focused only on its home market into a diversified global enterprise manufacturing and selling its products in a number of locations world wide. Haier's transformation coincided with the arrival of globalization in the late 1980s. Haier viewed globalization as an opportunity to climb up the global technology ladder, develop core competence, diversify its product range, and finally become a global leader in its business both in terms of market presence and technology. It thus began an intensive learning campaign involving a new focus on absorbing foreign technologies and developing core competences through technology alliances with leading global firms, acquisition of foreign firms, joint ventures, and establishing R&D and design houses world wide, especially in developed countries. As the 1990s unfolded, the company has diversified and grown rapidly. What are the distinctive features of Haier's strategy which helped it achieve rapid growth and diversification? The

discussion in the previous sections explored these strategies in detail. Below we list the challenges that Haier is facing on its ambition to become a global brand. We conclude the paper by discussing the prospects of other firms from less developed countries emulating some of Haier's strategies. This is attempted against the background of the role of the Chinese state in Haier's development and the changes in the international economic order being brought in by globalization.

4.1 Facing up to future challenges

Haier, like most Chinese companies, started off as a technological novice. Currently, however, Haier develops on average 1.2 new products and applies for 2.3 patents daily, and it ranks number one of all Chinese enterprises. Amidst the substantial progress it has made, the company faces major obstacles on its way to become a leading firm in global markets. For one, Haier remains highly dependent on foreign firms for key components and technology including high performance compressors and sensors. For another, it has a daunting task of convincing Western consumers of the quality of its products. Building a strong brand image is vital for selling higher-end products which Haier wants to sell in the US and European markets. However, this is a particularly difficult challenge because it takes several years, if not decades, to build up a respectable brand image. How has Haier been preparing itself to meet these challenges? We will answer this question by first reviewing Haier's strategy for operating at and extending the technological frontier, and then exploring Haier's attempts at quickly building its brand image in Western markets.

Innovation Strategies

Haier adopts a multi-pronged approach to enhance its technological base and develop innovative products. The key elements of this strategy are the following.

Internal strategies: Haier has been continually increasing its investment in R&D and innovation. It operates an R&D and design centre and has successfully introduced substantial process and product upgrading, as evidenced by a number of awards and registered patents. Haier has also set up local product-development teams in Tokyo, Germany and the US to differentiate its product line and move up-market. In terms of organizational capabilities, Haier is engaged in global consolidation of its operations, employing a strong and unifying perspective that has enabled it to capture advantages from its global reach and coordination, such as in logistics.

Overseas R&D and design centers: In addition to its R&D centres in China, Haier has set up several overseas R&D and design centres—six of them in industrialized countries: USA, Canada, Japan, France, the Netherlands and Korea. The company also has 15 overseas information centers throughout the world. The main responsibility of these foreign centers is to assist the company develop products that meet the specific needs and wants of local consumers.

International collaborations and acquisitions: These are central to Haier's technology acquisition efforts. Alliances and joint ventures with established global firms have taken place in many sectors such as refrigerator, washing machine, digital color television, telecommunication equipment and mobile phone. Such alliances, with leading companies like Liebherr, Philips, Mitsubishi and Toshiba, have provided important knowledge and experience to the company in its catching up process. In this context, Haier has been able to

leverage its leading position in China and its diverse product base to secure access to technologies that would otherwise have been unavailable. Apart from enhancing its technical know how in its existing product base, partnerships and acquisitions are enabling Haier to enter into new product spaces as well. Additionally, Haier has used these partnerships to train its staff.

In sum, Haier has been implementing a complex technology building strategy involving external sourcing of technology in combination with building internal capability through investment in R&D and design, repeated restructuring of the R&D organization, and improving general management capability.

The rapid expansion of Haier's technological base is reflected in the growth in the number of its patent applications, both in China and abroad. In China, where it first applied for two patents in 1992, its total patent applications at the end of 2007 stood at 2,120. After a slow start, Haier began to apply for hundreds of patents from the late 1990s. In the US, where it set up a production facility only in 1999, Haier's patent applications have been expectedly lower. It first made a patent application in 1999, and since then it has applied for a total of 37 patents. The product range of Haier's patent has also grown over time. In the US for example, aside from applying for patents in its traditional areas of strength, such as washing machines, refrigerators and air conditioners, Haier has applied for patents in other areas including for a "pen-type mobile telephone" in 2003.

Building up brand awareness

Building a strong brand image is also a top priority for Haier. This is because compared to Western multinationals, Haier suffers from poor international brand awareness. While Western consumers are familiar with brands like Whirlpool, Siemens and Philips, few of them have heard of Haier. Like most Chinese companies, Haier has for long been exporting lower-end products taking advantage of its low-cost manufacturing bases in China. In recent years, the company has begun to focus on selling higher-end products in Western markets. It is here that brand awareness becomes important because quality is usually associated with established brands. However, changing Western consumers' perception requires years of marketing efforts (Liu and Li, 2002). Haier has been taking a number of major steps to improving its brand awareness quickly. For example, Haier has established long-term relationships with OECD-based brand-building specialists. Another route to brand recognition that Haier has been exploring is acquisition of established brands, as well as their distribution networks. It made a bid for the US appliance maker Maytag. Although Haier later withdrew its bid (Whirlpool bought Maytag in 2006 to create the world's biggest appliance maker), it currently is "assessing the possibility of acquiring" General Electric's appliance arm. In 2006 Haier acquired 60% stake in the household-refrigerator business of Sanyo-Electric Company to form a joint venture named Haier-Sanyo-Electric.

Contribution of diversification to alliance formation

There is no doubt that entering into new product lines have contributed to Haier's growth. An important question remains, however. How important was the role of Haier's diversification strategy in helping it enter into technology alliances with leading global companies? Our answer to this question is speculative. Companies from China are often plagued by fundamental problems of poor transparency and disclosure standards. It is reasonable then to assume that the reputation being built up by the group as a whole, and not necessarily the

performance of individual product lines like refrigerators or washing machines, has helped the company forge alliances, on a partnership basis, with global players in a variety of technological fields. An additional explanation, from the industrial organization literature, rests on the fact that many of Haier's technology alliance partners are diversified firms themselves. The argument is that 'multipoint competitors are more likely to recognize their mutual dependence … to sustain tacit collusions in a range of markets in which they meet' (Ghemawat and Khanna, 1998).[15]

4.2 Lessons and conclusions

In many ways Haier Group epitomizes the dynamism of the Chinese industry today. Just over two decades ago, while China was looking for ways to vitalize its state-enterprises dominated industrial sector, Haier was waging its own battle for survival. Today, as with the Chinese industry, Haier has finally arrived on the world stage. The global success of Haier has an important implication: there is an alternative to the much-acclaimed East-Asian route to growth in which emerging multinationals begin as subcontractors or OMEs for established multinationals in the developed world, before establishing themselves as leading global firms[16]. While we do not intend to make generalizations based on a single case study, Haier's story is likely to hold true for many other emerging multinationals from China, and perhaps also India, which followed an extreme form of ISI. Like Haier, most companies from these countries initially used licensed technology from foreign firms and usually controlled the entire value chain of low-end products; production relationships with foreign firms were thus minimal or absent. However, with increasing competition in their domestic markets due to reductions in trade and investment barriers, many firms from India and China have been internationalizing their businesses. From being exporters of cheap products, these firms are seeking a slice of the global market for high-end products in their industries.

Haier's experience illustrates that it is possible for companies to adapt themselves through innovative strategies to meet the challenges, and, importantly, to exploit the opportunities of globalization. Haier has been able to leverage the industrial base it had established during a relatively protected phase of early growth, to forge alliances with global firms. To what extent can Haier's success be emulated by firms with similar backgrounds?

In our view, Haier's progress has not been just about innovative management of internationalization strategies. It has also been about the way in which the Chinese state has adapted its role. The prevailing view about technology transfer since the 1950s until at least the early 1980s was that technology could be easily 'bought' and 'unpackaged'. Thus governments that followed ISI strategies often acted as a 'hard bargainer' with foreign suppliers on behalf of domestic companies. The focus was inevitably on keeping the cost of technology at its lowest. However, in the globalized environment, intra-firm learning is only secondary to learning through external interactions. Established firms are taking a variety of

[15] In 2002, the year when Haier entered into a technological alliance with Sanyo, the two companies reached an agreement to use each other's distribution networks. Under the agreement Haier would sell Sanyo products in China, and a Haier-Sanyo joint venture would sell Haier-branded products in Japan—a step unusual in the Japanese market (Wall Street Journal Europe, Jan 9, 2002). The diversified product lines of Haier and Sanyo must have made the deal attractive to both parties.

[16] That is not to ignore the significant role of licensing of technology in the technological catching up of Taiwanese or Korean firms. But many of these firms also engaged in production relationships with foreign partners. In addition, unlike in China and India during their ISI phase, the incentive structure in these countries necessitated learning from licensed technologies and continual technological upgrading for improving competitiveness.

measures to keep their technologies from leaking (see, for a discussion, Radosevic, 1997). Thus, while production capabilities could be achieved in house, acquiring design capabilities requires developed network of partners and sourcing capabilities. In other words, technology is no longer traded at the boarder, but through MNC structures or through sourcing arrangements (subcontracting, alliances) over which government has little control. In such a context, the Chinese government appears to have performed the role of a 'supporter and organizer of technology networks'. In this respect, the Chinese state must have learnt its lessons from its Korean and Taiwanese counterparts.

The Chinese government—both the central and local governments—has a major influence in the strategic decisions of conglomerates like Haier. The company can therefore rely on governmental guidance in matters such as choosing a foreign partner. Government can also play a vital role in assisting large scale foreign acquisitions. For example, China Investment Corp (CIC), a sovereign wealth fund that controls a substantial part of China's foreign exchange reserves, has a mandate to assist Chinese companies such as Haier in their overseas acquisitions.[17]The government also provides direct financial contributions to firms for enhancing their technological capabilities. For example, in 1998 Haier group was one of six large Chinese conglomerates selected to receive RMB 20 million each for technological innovation. Another aspect that is perhaps unique to China is the way in which the state contributes to the creation of large enterprises. In 1997 as part of its strategy of 'grasping the large while letting go of the small' government focused on establishing 'enterprise groups', by combining large state owned enterprises (SOEs), to reap the benefits of economies of scale and international competitiveness. Thus in electrical household appliances sector, Haier and its Chinese rival Konka Group have merged with several smaller SOEs in Anhui, Guizhou, Heilongjiang, Jiangsu, Shaanxi and Zhejiang provinces.[18]

Haier's spectacular growth embodies the dynamism exhibited by emerging MNCs from China. It demonstrates that success in the globalized age is about embracing globalization, diversifying, and partnering with and acquiring global firms. The success of Haier, and other globalizing firms from China and India, also underscores that firms that operated inefficiently under ISI can turn around and become internationally competitive through developing appropriate internationalization and domestic capability building strategies. Haier's case further illustrates that the state can play a very important role in this process—by not being an arbitrator between domestic and foreign firms as it did under ISI but by being a supporter and facilitator of firms' technological sourcing strategies.

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[17] For example, consider Haier's bid for General Electric's appliance business. While the bid is expected to fetch US$7 billion, Haier appears to have little difficulty in mobilizing that amount; it could potentially tap CIC or China Development Bank to help finance the deal (FT, 2008). Other benefits the company receives from the Chinese government include assistance for R&D, government introducing foreign customers to Haier, and cheaper input costs due to supply from subsidized state-owned upstream industries. The latter is especially important in the technologically matured white goods sector where cost competitiveness is paramount.

[18] A downside of such mergers is that local governments in China bully firms like Haier to buy loss making enterprises. The list of companies 'offered' to Haier ranges from a pharmaceutical company, which Haier bought and the joint venture ended in a disaster, to a bicycle company which Haier refused to buy (Newsweek, 2005)

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