
Strategic entrepreneurship and the growth of the firm: the case of Taiwan's bicycle industry

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Abstract: Taking advantage of the modular product architecture in the global bicycle industry, Taiwan has created a unique industry organisation that has allowed the island to become a bicycle production powerhouse. We stipulate four characteristics of Taiwan's bicycle industry for this success: parallel networking, abundant entrepreneurial firms, supportive government and close ties with the USA and Japan. In the case study of Giant Bicycle Corporation, we integrate the entrepreneurship perspective with strategic management to explain the wealth creation and the growth of the firm. With strategies on internal organisation reengineering and global deployment, Giant has been able to build up its sustainable competitive advantages. We conclude that entrepreneurship is the key element for the growth of the firm and even a labour-intensive or non-high-technology industry can be selected as a development strategy.

Keywords: Taiwan; bicycle industry; entrepreneurship; strategic entrepreneurship; entrepreneurial learning; modularity; competitive advantages; Giant Bicycle Corporation.

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1 Introduction

The bicycle industry, with widely established international standards and a modular production architecture, allows manufacturers to meet the simultaneous needs of product innovation and cost reduction.¹ Taiwan's bicycle industry has been gradually gaining competitive advantages by establishing a unique industrial cooperation structure, which integrates parts producers, assemblers and international buyers in an efficient way. Starting out as Original Equipment Manufacturing (OEM), Taiwan's bicycle industry has successfully transformed itself to be a part of Original Design Manufacturing (ODM) and has become a base for Own Brand Manufacturing (OBM).²

The success of Taiwan's bicycle industry is a microcosm of the island's economic development, which has been praised as a 'miracle', and proffers developing countries a model on how to climb up the developing ladder to a leading level.³ Distinct from the growth strategy of South Korea, with its emphasis on the conglomerate or *chaebol*, Taiwan's dynamic and adaptive Small- and Medium-sized Enterprises (SMEs) have been credited as representing another model that could compete in the highly competitive global economy in the 21st century, as indicated by Yusuf *et al.* (2003). With an abundance of SMEs,⁴ Taiwan has been praised as an island full of bosses and an entrepreneurial society (Shieh, 1992). There are several examples of enterprises in Taiwan that were first initiated as very small firms relying on outsourced mass production for international companies and which have ended up as world-class companies with the ability to implement OBM, such as Acer, BenQ and Giant.⁵

There is no dearth of studies on the success of Taiwan's bicycle industry. Based on an evolutionary view on Taiwan's bicycle industry, Chu (1997) ascribes three forces that contribute to the prosperity of Taiwan's bicycle industry: accumulated learning, a favourable environment and globalisation of production.⁶ Cheng (1998) emphasises that double networks, *i.e.*, production and market networks, simultaneously serve to help Taiwan's bicycle industry to succeed. The production network is manifested in the bicycle industry clustering in the central part of Taiwan, while market networks offer the opportunity to learn from the outside, particularly foreign OEM buyers. In his explanation of Taiwan's efficient bicycle industry structure, Chang (2004) contends that Taiwan has created a parallel production networking model, in which parts producers, assemblers and foreign OEM buyers are closely connected with each other and each has room to realise its own benefit.

Another way to see why Taiwan's bicycle industry is prospering is to compare the industry structure with those of different countries. Chu and Li (1996) argue that Taiwan's bicycle industry success is because of its numerous SMEs in both assemblers and parts producers. Conversely, South Korea has relied upon four huge assemblers

playing the leading role while parts companies act as subsidiaries. Furthermore, Taiwan's bicycle companies are export-oriented, and a global market enables Taiwan's parts companies to exploit the benefits of economies of scale.⁷ In a study on why Japan's bicycle industry failed while Taiwan's has succeeded, Sato (1998) argues that the difference lies in the outward-oriented strategy adopted by Taiwan's bicycle companies, while Japan's firms relied on the domestic market, *i.e.*, they were inward-oriented.⁸

In this paper, we attempt to contribute to the current studies on Taiwan's bicycle industry in three dimensions. First, although the contribution of entrepreneurship has been referred to many times (Chu, 1997, for instance), very few have discussed how exactly entrepreneurship functions, *i.e.*, what the process of opportunity discovering is and how entrepreneurial learning proceeds. We intend to bridge this gap. Second, since the goal of entrepreneurship is to create wealth and spur the growth of the firm, an entrepreneurial firm needs to use a managerial strategy to gain competitive advantages and maintain a perpetual source of wealth. It is this strategic entrepreneurship which we emphasise in this paper that has enabled Taiwan to become the kingdom of bicycles since the 1980s. Third, economic development theories usually suggest that in order for the latecomer firms of developing countries to catch up with those of industrialised countries, they need to develop high-tech industries through acquiring external technology and knowledge diffusion and internalisation (Amsden and Chu, 2003; Hu and Mathews, 2005).⁹ However, by studying Taiwan's bicycle industry, and Giant Bicycle Corporation in particular, we demonstrate that a labour-intensive or non-high-technology industry can also be selected as a development strategy. What really matters is incubating the strategic entrepreneurship.

The rest of this paper is organised as follows: In Section 2, the theories of entrepreneurship and strategic management are discussed to build the foundation for our study on Taiwan's bicycle industry. Section 3 describes the developing phases of Taiwan's bicycle industry and analyses its unique characteristics. In Section 4, we investigate Giant Bicycle Corporation as a case study and discuss how it has grown from OEM to OBM. We conclude with Section 5.

2 Entrepreneurial learning, competitive strategies and the growth of the firm

What entrepreneurship deals with is the growth of the firm and wealth creation (Certo *et al.*, 2001; Ireland *et al.*, 2001). The study of entrepreneurship focuses on the discovery, evaluation and exploitation of opportunities (Langlois, 2005).¹⁰ However, theories of entrepreneurship have studied less on how to effectively exploit opportunities, although it is well acknowledged that maintaining continuous competitive advantages to create a perpetual source of wealth is essential for the growth of the firm. This gap can be filled by strategic management, particularly in the Resource-Based View (RBV) of the firm (Barney, 1991; Barney, 2001). In this paper, we attempt to combine entrepreneurship and strategic management to lay the foundation for analysing the growth of the firm. These two fields of research complement each other well. An entrepreneurial firm harnessed with strategic management results in superior firm performance (Ireland *et al.*, 2003).

2.1 *Entrepreneurial learning and entrepreneurial mindset*

Entrepreneurship has been noted as the key to the growth and survival of firms in a volatile environment because entrepreneurial judgement is necessary for success in making complex decisions under uncertainty (Casson, 2005). Living in a world of uncertainty, an economic problem is a knowledge problem (Hayek, 1945). Learning generates knowledge, which serves to reduce uncertainty. Learning is a process that leads to the production of knowledge, and knowledge needs to be revised and updated constantly. In other words, it is learning, not knowledge itself, which is critical. Smilor (1997) contends that effective entrepreneurs are exceptional learners.¹¹ The learning or discovery process involves the history of the entrepreneur's own past experiences of success and failure. Owing to path dependence, learning is more difficult in novel domains. A diverse background provides a more robust basis for learning because it increases the prospect that incoming information will be related to what is already known (Cohen and Levinthal, 1990).

The capability accumulated from entrepreneurial learning can be forged into an entrepreneurial mindset, which encourages creativity and innovation (Shane and Venkataraman, 2000). As predicated by McGrath and Macmillan (2000), entrepreneurs with prior start-up experience have developed an entrepreneurial mindset that drives them to seek and pursue entrepreneurial opportunities with enormous discipline, and hence they can be expected to pursue only the very best opportunities.

2.2 *Entrepreneurial firms and competitive advantages*

Entrepreneurs are important to the functioning of a market economy (Kirzner, 1973).¹² However, entrepreneurs need to organise institutions to implement their judgements. As noted by Knight (1921), the presence of uncertainty transforms society into an 'enterprise organisation'. Reducing uncertainty by transforming it into a measurable risk through grouping constitutes a strong incentive to extend the scale of operation of a firm. Accordingly, firms exist because entrepreneurs need them to prove the results of implementing judgements and reducing uncertainty.¹³

How an entrepreneurial firm creates a perpetual source to accumulate wealth or to survive depends on whether it can accumulate sufficient capabilities to facilitate its continuous innovation. Emphasising a firm's capability is the core of the RBV of the firm (Barney, 1991; Conner, 1991; Peteraf, 1993), which comprises three distinct subgroups: tangible assets, intangible assets and capabilities.¹⁴ The central elements of the RBV regard firms as seekers of costly-to-copy inputs in the operations of production and distribution (Barney, 1991; Conner, 1991; Peteraf, 1993; Alvarez and Busentiz, 2001). Hence, heterogeneity is a critical principle for an RBV of the firm and in fact entrepreneurship *per se* is a valuable resource for maintaining a sustainable competitive advantage (Alvarez and Busentiz, 2001).¹⁵

In sum, entrepreneurship is essential for the firm to create wealth, but it needs to incorporate strategic management to maintain sustainable competitive advantages. As noted in Ireland *et al.* (2001), entrepreneurship is an activity of opportunity seeking, while advantage seeking is a behaviour of strategic management.¹⁶ In their interpretation of entrepreneurship, Ma and Tan (2006) illustrate a 4-P framework: perspective, pioneer, practice and performance, which literally incorporates the entrepreneurship perspective

and strategic management.¹⁷ In the following, we adopt this integrated concept, *i.e.*, strategic entrepreneurship, to explain the growth of Taiwan's bicycle industry and Giant Bicycle Corporation.

3 Competitive advantages of Taiwan's bicycle industry

The bicycle industry, with widely established international standards, is fragmented into a series of independent segments that are primarily linked through the operation of market-based contracts. The fragmentation of the industry on the basis of specialised capabilities, as noted by Galvin and Morkel (2001), has led to economic efficiencies and lower barriers to entry for most segments of the industry. Sanchez and Mahoney (1996) argue that modularity permits components to be produced separately, or 'loosely coupled', and used interchangeably in different configurations without compromising system integrity. In practice, with defined interfaces for most bicycle components, component manufacturers could manufacture without or with very little reference to the assembler.

With numerous SMEs, Taiwan is able to take advantage of the modularity to exercise economy-of-scale production by limiting firms' production range. Assemblers could rely on the market to purchase components instead of manufacturing a complete range of components internally. For instance, Chu (1997) notes that over 90% of Taiwanese bicycle assemblers only produce the frame, 94% of Taiwanese component manufacturers only produce one classification of bicycle components, and 60% of them only produce one type of component. In addition, the survey of Chu and Tung (1990) indicates that on average, each bicycle producer has about 60 parts suppliers and each parts producer supplies up to 20 bicycle assemblers.

At the early stage of Taiwan's bicycle industry, with the close network between producers and assemblers, foreign OEM buyers flooded into Taiwan. OEM buyers brought not only purchasing orders, but also new technology which helped upgrade Taiwan's bicycle production capability. A unique industrial structure, which combines the parts producers, assemblers and foreign OEM buyers, has been gradually formed. The efficient production organisation of Taiwan's bicycle industry has enabled Taiwan to emerge as the 'kingdom of the bicycle' since the beginning of the 1980s.

3.1 Developing phases of Taiwan's bicycle industry

As a former colony of Japan, Taiwan's bicycle industry underwent a transformation from dependence on Japanese imports to local production and unified specifications. It has evolved into an international industry selling its own brands of bicycles around the world. In what follows, we briefly introduce the development of Taiwan's bicycle industry over five distinct phases.

Phase 1 The early years: a Japanese colony in the 1930s

The first bicycles used in Taiwan were imported from some of the well-known Japanese manufacturers, such as Fuji, Kent, Large and Premier. Owing to an acute shortage of parts, as well as the low incomes of the people, repairing and maintaining bicycles were

not easy tasks. As time went by, some enterprising individuals began importing parts from Japan, and eventually five major wholesalers of imported parts, known as the Five Tiger Generals, caused Taiwan to become a newly emerging production centre of bicycle parts.¹⁸ In order to streamline Taiwan's higgledy-piggledy parts specifications, Mr. Hsu Shao, the then director of the Taiwan Bicycle Industry Association, visited Japan's bicycle manufacturers and brought back some valuable data regarding Japan's parts specifications. Shao persuaded Taiwan's parts manufacturers to unify their specifications and helped set up the fundamental standards for Taiwan's bicycle industry. During this period, Taiwan's bicycle industry was still in its infancy and relied completely upon imitating and learning.

Phase 2 The years of import substitution: the 1940s/1950s

In the early days of independence from Japan, Taiwan's bicycle industry focused on the domestic market. To reduce the dependence on foreign exchange reserves for imports and to protect the domestic bicycle industry as well, the government prohibited the importation of whole bicycles and some of the parts (rims, front forks, handlebars, frames, chains and hubs) in 1954. At that time, since bicycles were expensive and were the most reliable form of transportation for Taiwanese commuters, Taiwan's government posted regulations regarding the distribution of bicycles and licence plates in 1956. Thanks to the success of the economic policies initiated by the government in 1953 and 1968, the demand for domestic bicycles rapidly increased along with income levels.¹⁹ However, bicycles lost their importance when 49cc Japanese motorcycles, which did not require special licensing, began to be imported in 1968.

Phase 3 The initial export drive to the golden age: the 1970s

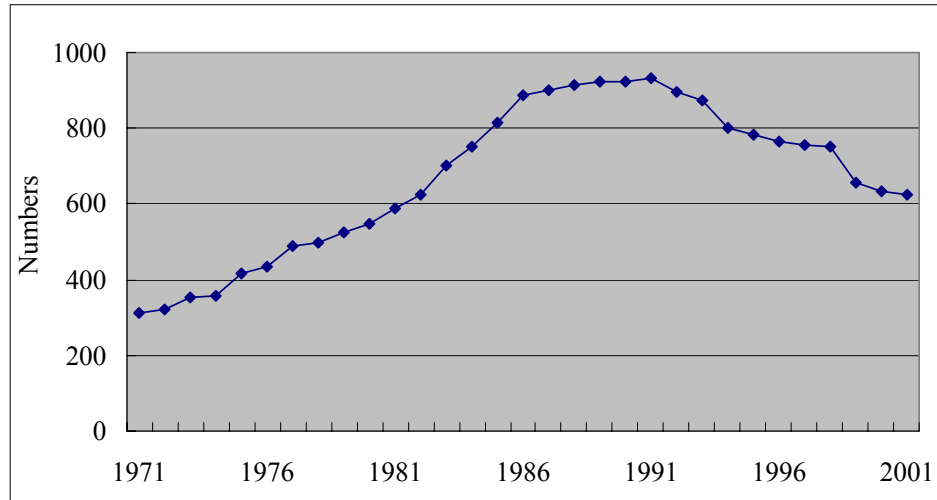
The exhibitions of Taiwanese merchandise organised by Taiwan's government helped Wu Lien Bicycle Corporation become the first Taiwanese bicycle manufacturer to export 50 bicycles to Indonesia in 1969. By 1971, Taiwan's bicycle exports stood at only 270 000 units with a total value of US\$4 million (see Table 1). In the 1970s, however, the emergence of the BMX (the 1st-generation mountain bike) marked the beginning of a new golden age for Taiwanese bicycles and numerous bicycle companies were established after 1970, as shown in Figure 1. The first oil crisis in 1973 stimulated the demand for bicycles around the world and accentuated the growth of Taiwan's bicycle industry.

The year 1974 was the turning point for Taiwan's bicycle industry. Exports to the USA grew rapidly. Tantalised by the buoyant profits from exporting, many underground bicycle assemblers emerged in the early 1970s and produced large quantities of bicycles of low quality and with many defects. Waves of dumping charges were filed by the USA and Canada in 1974. In 1976, Taiwan finally lost Canada's bicycle market and accordingly its export volume declined to 815 000 units in 1975 (see Table 1).²⁰ In 1975, right after the USA announced its bicycle safety standards, the government established national standards for Taiwanese bicycles within the Quality Control System and prohibited exports of bicycles that did not qualify. This caused the number of bicycle assemblers to decline, but boosted the industry's export volume at the end of the 1970s.

Table 1 Exports of Taiwan's bicycle industry, 1970–2005

<i>Year</i>	<i>Production (units)</i>	<i>Exports (units)</i>	<i>Exports (value)</i>	<i>Export ratio (%)</i>	<i>Exports to the USA (%)</i>	<i>Exchange rate (NTD/US\$)</i>
1970	N/A	107,141	72,199	N/A	N/A	40.00
1971	N/A	270,000	168,808	N/A	N/A	40.00
1972	1,184,000	1,055,392	985,007	88.25	85.58	40.00
1973	1,542,000	1,318,112	1,292,108	89.75	81.41	38.00
1974	1,084,000	867,545	1,029,003	84.42	66.72	38.00
1975	957,000	815,752	873,499	82.98	48.51	38.00
1976	1,673,000	1,523,849	1,707,578	88.90	41.02	38.00
1977	2,002,000	1,745,000	2,103,594	89.29	46.11	38.00
1978	2,289,000	1,849,418	2,371,964	88.56	51.47	37.04
1979	2,483,000	2,204,000	3,784,521	89.49	53.51	36.08
1980	3,101,000	3,003,045	5,032,201	91.48	40.95	36.06
1981	3,476,000	3,338,035	6,184,981	91.94	42.65	37.89
1982	3,213,000	3,146,000	5,505,136	91.36	45.10	39.96
1983	5,266,000	5,058,291	8,964,246	93.86	59.80	40.32
1984	6,539,000	6,328,278	11,143,197	94.47	69.38	39.52
1985	7,715,000	7,442,063	11,952,162	95.01	74.48	39.85
1986	10,768,000	10,239,473	16,688,755	95.88	78.65	35.50
1987	10,227,000	9,685,344	17,511,384	95.16	73.92	28.55
1988	7,717,000	7,151,626	13,613,924	93.09	62.36	28.17
1989	7,573,000	8,200,883	17,104,898	93.98	53.28	26.16
1990	7,794,000	8,942,518	24,388,273	94.03	43.45	27.13
1991	9,831,048	8,361,000	24,067,006	85.05	33.70	25.75
1992	8,427,073	7,689,000	24,503,020	91.24	32.40	25.40
1993	8,621,237	7,867,000	27,450,278	91.25	32.80	25.63
1994	8,751,660	7,537,000	26,065,229	86.01	30.50	26.24
1995	9,064,129	7,656,000	28,200,000	84.46	32.20	27.27
1996	9,485,000	7,385,000	26,910,000	87.04	30.70	27.50
1997	8,827,000	7,238,000	24,519,000	82.00	32.50	32.64
1998	9,779,000	9,388,000	29,925,000	96.00	36.66	32.22
1999	8,150,000	7,783,000	24,523,000	95.50	35.52	31.40
2000	7,848,000	7,534,000	25,548,000	96.00	31.23	33.00
2001	4,747,000	4,596,000	17,978,000	96.82	28.50	34.20
2002	4,975,000	4,760,000	19,811,000	95.68	31.70	34.21
2003	4,792,601	4,562,892	21,854,000	95.21	26.50	33.25
2004	5,200,000	4,957,822	26,034,000	95.34	24.40	33.52
2005	5,562,000	5,241,000	30,684,000	94.23	25.80	32.76

Source: Ministry of Finance (various years)

Figure 1 Number of Taiwanese bicycle companies, 1971–2001

Source: Wheelgiant (2002)

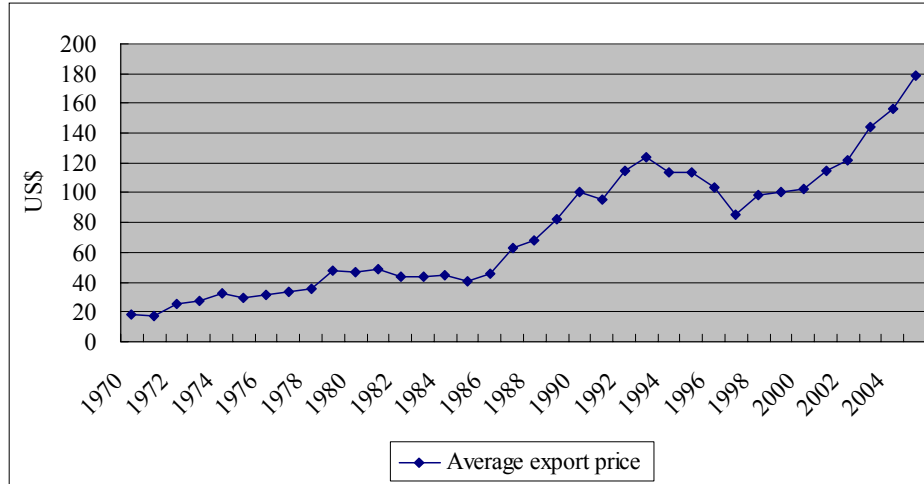
After gaining access to the welding technology for the BMX, Taiwan surpassed Japan in the US bicycle market.²¹ Thereafter, the rise of the Mountain Bike (MTB) enabled Taiwan's bicycle industry to achieve new heights and several new rising stars of the 1980s – Giant, Merida and Yuh Jiun – emerged.²² Subsequently, OEM contracts flooded into Taiwan from the USA and Taiwan's bicycle industry entered its golden age. Table 1 depicts the significant surge in Taiwan's bicycle industry since the second half of the 1970s.

Phase 4 Sustained growth and industrial upgrading: the 1980s

In 1980, exports of Taiwanese bicycles surpassed those of Japan, and Taiwan became the world's number one exporter. As shown in Table 1, the quantity of bicycles exported grew 38 times over the period from 1971 (270 000 units) to 1986 (10 million units). Taiwan was the largest bicycle exporter to the USA from 1980 to 1992.²³ With the emergence of China in the global economy, Taiwan's bicycle exports were gradually outstripped by China's low-end bicycles, and since 1993, China has been the largest exporter to the USA. It is important to note that the rapid growth in the quantity of Taiwanese bicycles exported did not go up with the average export price; and to make it even worse, the export volume even declined or went flat after 1987 (see Table 1).

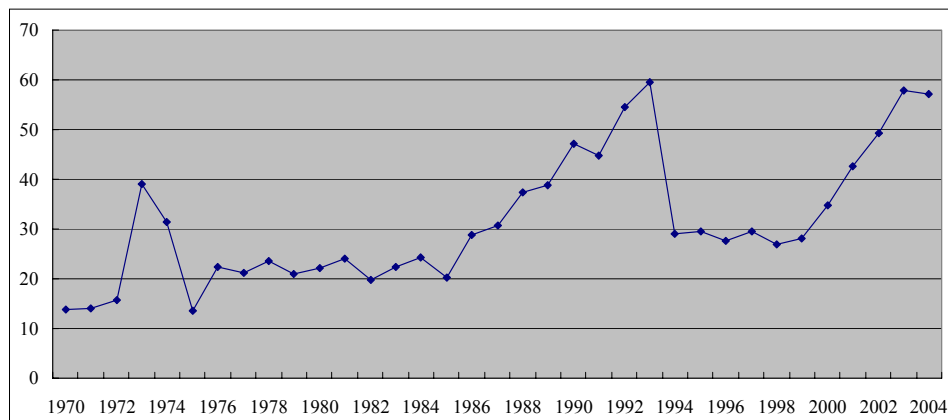
Phase 5 R&D centre and global deployment: the 1990s and after

In 1990, while the value of Taiwan's bicycle exports reached unprecedented heights (US\$24.3 million), the export share to the USA started declining to around 30% (see Table 1). Notwithstanding this, owing to cutthroat pricing competition with China and India at the beginning of the 1990s, the upward trend of average unit price was dented (see Figure 2). With the urgency towards producing high-quality and high-value-added bicycles, the unit price of bicycles started to go up beginning in 1998. However, the import dependence ratio also jumped, because the components of the high-end bicycles have been controlled by Japan, Shimano in particular.²⁴

Figure 2 Average export price for Taiwan's bicycles, 1970–2005

Source: Ministry of Finance (various years)

The emergence of China as an economic powerhouse has provided many opportunities for Taiwanese companies with similar styles of business practices and with the same culture and language across the Taiwan Strait. In view of significantly lower labour costs in mainland China, many Taiwanese bicycle companies have set up production factories there, although the design work is conducted and high-end bicycles are still produced or assembled in Taiwan. Figure 1 shows that since 1991, the number of Taiwan's bicycle companies has decreased, and Figure 3 shows that the import-dependence ratio has climbed up again since 1999. Both of these outcomes result from the attractiveness of China and indicate that the production of low-end bicycles has moved to China while that of high-end bicycles has remained in Taiwan. In terms of business practices, the slogan 'Order to Taiwan, produce in China, and distribute globally' has become very common.

Figure 3 Ratio of import dependence for Taiwanese bicycle components, 1970–2004

Source: Ministry of Finance (2005)

3.2 *Characteristics of Taiwan's bicycle industry*

Four characteristics of Taiwan's bicycle industry during these five phases of development are worth noting. They not only shed light on why Taiwan has become the darling of international OEM buyers, but also help one to understand how Taiwan outstrips its competitors in the global bicycle industry.

3.2.1 *Local business network and parallel networking*

Taiwan's bicycle industry has developed a complete parts supply list with a close network weaving together those parts suppliers and assemblers. This business network manifests in the industry cluster concentrated in the central part of Taiwan. Chu (1997) and Cheng (1998) show that the majority of Taiwanese bicycle firms are located in the central part of Taiwan (about 64%). The geographical concentration of the parts and assemblers not only reduces the transportation cost, but also facilitates the spreading of knowledge and personnel circulation.²⁵ This well-established bicycle structure enhances competitiveness and has turned Taiwan into the most favourite destination for international OEM buyers.

Taiwan's unique bicycle cooperation system works in such a way that assemblers and components suppliers are parallel-connected to interact with foreign OEM buyers simultaneously (Chang, 2004). In this parallel networking system, the parts suppliers and assemblers are each dedicated to specialised technologies in their own areas, with maximised economies of scale and minimised cost on investment, in order to meet the requirements of the OEM buyers for speed and specialised innovation for each component. Consequently, the bicycle assemblers are able to focus on the design of the frame, while each part supplier concentrates on its own innovation for the other parts, such as wheel, tyre or handlebar. This well-connected production network attracts more foreign OEM buyers and their technology, which creates more wealth opportunity and improves Taiwan's bicycle industry competitiveness.

3.2.2 *Entrepreneurial firms and favourable transition from OEM to OBM*

An OEM firm needs neither to establish distributional networks nor to maintain a strong internal R&D base to develop new products, and both can be costly. Indeed, the OEM industry helped create the wealth in the early development of Taiwan's bicycle firms. However, the development of an industry cannot depend upon the OEM system for good. Although the technology accumulated through decades of OEM sequentially enabled firms to execute Original Design Manufacturing (ODM), Taiwan's bicycle industry inevitably reached a crossroads.²⁶ One way led to fierce price competition among the domestic producers or to other low-labour cost countries catching up with them. The other way was for a firm to lift up its quality or initiate its own brand to create a new market. With an abundance of entrepreneurial firms, Taiwan has been able to move to the OBM stage.

Aside from the entrepreneur's initiative, there are other elements essential for Taiwan's bicycle industry to move to the OBM stage. First, decades of OEM have upgraded the production skill, and the effective industry collaboration network has put up a solid logistic foundation for supplying parts and assembling bicycles. The environment has certainly been mature for experimenting with OBM. The second is that Taiwan's

R&D has accumulated sufficient capabilities. For instance, as shown in Table 2, filed patents of Taiwan's bicycle parts and complete bicycles have reached a significant number.²⁷ This also reflects well on the reduction of the parts import-dependence ratio to the lowest amount, as shown in Figure 3, as well as the remarkable performance of export value since 1995, as shown in Table 1. Indeed, some of the bicycle firms, including bicycle assemblers like Giant and Merida or parts producers like Sun Race and KMC, are able to successfully promote their own brand products in the international market.²⁸

3.2.3 Supportive government

Taiwan's government has been well known for its active role in industry policy (Amsden, 1989). The bicycle industry is no exception, but unlike its aggressive support in the high-tech industry, government intervention has been passive yet effective in the bicycle industry (Chu, 1997). Two occasions of government intervention helped steer Taiwan's bicycle industry towards the right track. The first occasion, as aforementioned, was in the early 1970s when rapid export growth resulted in many shoddy products and solicited a retaliatory response from North America. With the government's assistance, a national standard for the bicycle was established.

The second occasion of government intervention was in the beginning of the 1980s, when Taiwan's bicycle industry was forced to upgrade because of the competition from other developing countries, particularly China. With the help of the government, Taiwan's bicycle firms launched two projects in 1984 and 1985 aimed at further integrating the fragmented bicycle industry, developing advanced materials and reducing dependence on importing key components.²⁹ In 1991, with support from government, the composite carbon-fibre frame was developed, and the technology was successfully transferred to Giant, Merida, Hodaka (Taiwan) and Ta-Ming in 1992. After 1993, the import-dependence ratio fell, as shown in Figure 3, which signifies that Taiwanese components manufacturers have been gaining in innovative capability.³⁰

To support Taiwan's bicycle industry on a perennial base, in 1992 the government urged the establishment of the Taiwan Bicycle Industry R&D Center (TBIRDC) – a nonprofit organisation. The TBIRDC was established in order to develop the bicycle's key components (mainly gearshifts), to promote foreign bicycle markets, and to focus on bicycle design, mechanical innovation and the standardisation of testing. Under the support of the TBIRDC, the only international bicycle design competition, the 'Taiwan Creative Bicycle Design Competition', was launched and has been successfully held on an annual basis ever since. The TBIRDC intends not only to upgrade Taiwan's bicycle industry, but also to position Taiwan as a global information exchange and communication pivot for bicycle designers, manufacturers and aficionados all over the world.

3.2.4 Close relations with the USA and Japan

The USA, with the largest bicycle market in the world and demanding consumers, offers Taiwan's bicycle industry an opportunity to exercise economies of scale to accumulate wealth and to learn and improve the technology to upgrade its capabilities from OEM buyers. Table 1 (column 5) shows the export history of Taiwan's bicycles to the USA, which has long been the number one destination of Taiwan's bicycle exports, although the proportion is decreasing from a peak of 79% in 1986 to 26% in 2005.

Table 2 Number of patents for Taiwan's bicycle and key components

Type of patents	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
R&D Centre (<i>Runride</i>)	1	4	2	7	2	5	2	1	11	14	31	32	22	28	24	3	189
Wheel segments	22	16	6	7	14	25	13	18	16	14	27	37	45	36	48	55	399
Frame segments	24	58	44	71	71	91	82	85	64	89	134	129	70	79	91	122	1304
Transmission segments	8	16	16	13	19	16	24	17	21	11	32	23	14	33	35	35	333
Brake segments	16	44	17	23	33	61	57	68	35	47	62	54	41	40	36	44	678
Steering segments	11	22	23	40	44	55	43	35	28	41	52	49	24	35	53	58	613
Accessories	9	16	15	35	24	58	38	29	27	19	34	39	31	47	36	54	511
Complete bicycle	5	15	12	14	18	12	6	11	10	14	19	32	36	36	29	49	318
Total	96	191	135	210	225	323	265	264	212	249	391	395	283	334	352	420	4345

Note: *Runride* is Taiwan's bicycle R&D centre, <http://www.runride.com>.

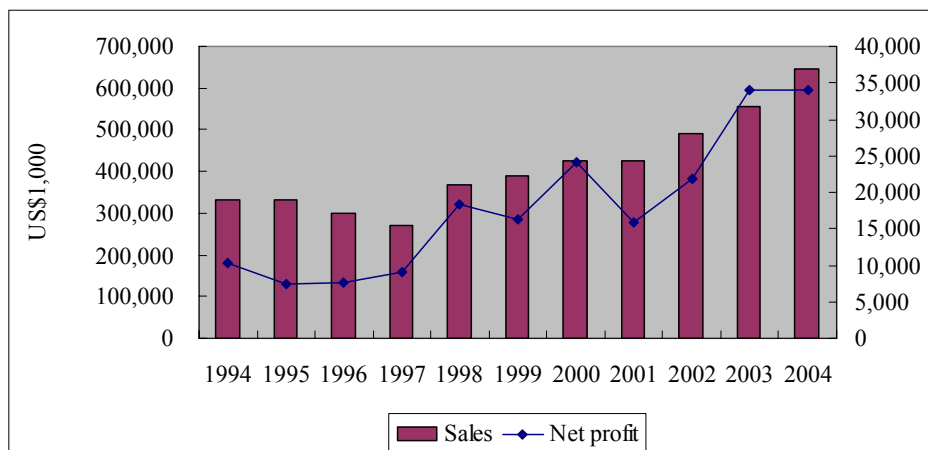
Source: Taiwan Intellectual Property Office, <http://www.tipo.gov.tw>

While Taiwan engages in producing high-end bicycles, the dependence on Japanese parts looms large. Japan's Shimano plays a key role in the high-end components market because it controls the key components of the bicycle, particularly transmission segments.³¹ An apt analogy goes that the value of Shimano's derailleur to a bicycle is just like that of Intel's CPU to a computer. With rapid changes on new products with new designs, Shimano keeps playing a leading role in the bicycle industry.³² However, Taiwan has positioned itself as an efficient supplier of parts and assemblers and has become an indispensable link of the international production network of the bicycle industry. For instance, each year Shimano publishes its new design of the derailleur at the beginning of March, and the specification of other parts' fit with Shimano's design can then be identified. At the end of March, international buyers come to Taiwan's Annual International Bicycle Exhibition to place orders.

4 Case study on the Giant Bicycle Corporation and King Liu

The growth of the Giant Bicycle Corporation (Giant, hereafter) runs parallel with the development of Taiwan's bicycle industry; by all means, it also manifests the legend of King Liu.³³ Giant was founded in 1972 with a capital of US\$100,000 and total sales in 1973 was only 18 000 units. By 2004, Giant had become the largest bicycle corporation in the world. In 1994, Giant went public on the Taiwan Stock Exchange with a market capitalisation of US\$41 million. By 2005, the total capital of Giant had increased to US\$84 million. With 20 subcompanies extending from Asia and Australia to Europe and the USA, Giant's total sales has reached 3 million units or US\$6 billion in revenue (see Figure 4).³⁴ In 2001 and 2002, Giant was recognised as one of the world's best 200 small businesses by Forbes. Nevertheless, in 2003, when Taiwan's government honoured the ten best Taiwan-made international brands, Giant was awarded 6th place, with its imputed brand name worth US\$211 million.³⁵

Figure 4 Giant sales and net profit, 1994–2004



Source: The Giant Group (1994–2005)

As elaborated in the previous section, Taiwan's bicycle industry with its unique cooperation structure has transformed from an efficient production base to a competitive design powerhouse. It is under this environment that Giant has grown to become a leading bicycle producer. In the following, using the concept of strategic entrepreneurship, we analyse how Giant went from an OEM firm to an OBM giant.

4.1 Opportunity discovery and entrepreneurial mindset

Kirzner (1973) argues that the role of entrepreneurs lies "in their alertness to hitherto unnoticed opportunities". An entrepreneur possesses a superior perception of opportunity. Entrepreneurship is a particular type of mindset which assigns different values to opportunities than does the general population. Shane and Venkataraman (2000) contend that the entrepreneurial mindset encourages creativity and innovation, changing the game, and being unique. Putting it plainly, an entrepreneurial mindset has the perspective of challenging the *status quo* and finding new ways of doing things (Ma and Tan, 2006).

4.1.1 Opportunity discovery and the founding of Giant

After noticing that the USA had started to promote exercise and bicycle riding, which had become fashionable, King Liu and his nine partners figured that the demand for bicycles would surge and that it would be profitable to export bicycles to the USA. In 1972 they started their company, Giant Mechanic Corporation, in order to produce bicycles.³⁶

King Liu believed that, regardless of how the economy grows or to what extent a country has been industrialised, the bicycle will always be needed. In particular, after experiencing the first oil shock and noting the increase in environmental awareness, he realised that cars or motorcycles would not be able to replace bicycles completely. With the growth of the economy, the demand for bicycles would grow with increased recreation, and a strong demand for high-end bicycles could be expected. On the other hand, in less developed countries, such as China and India, bicycles would still be used for transportation, which would mostly be on the low and medium end. With two-thirds of the world's population living in underdeveloped countries, the demand for bicycles would remain high (Wei, 2005). Based on this perception, King Liu and his partners started the business.

4.1.2 Entrepreneurial mindset

Before reaching the age of 40, King Liu had ventured into different kinds of businesses, such as food processing, packaging, machine tools, fish food and horticulture (raising eels). Although none of the businesses he had engaged in went bankrupt, neither could they be deemed successful. On average, he changed his type of work every two or three years (Wei, 2005). Liu's capabilities were galvanised by his previous experiences of wading through different walks of life, which helped Giant's subsequent growth, particularly when Giant went through different periods of hardship.

In the 1970s, the specifications of bicycle components were not regulated within Taiwan's bicycle industry. Being aware that quality was the number one goal for a product to maintain a sustainable level of competitiveness, King Liu travelled to Japan on two occasions to obtain the Japanese industry standard in order to improve the quality of

Giant's Bicycles. At the same time, he also tried to disseminate a quality consciousness and persuade bicycle parts suppliers to unify their parts specifications. The persistence of the belief in improving quality did pay off and Giant survived the shake-out in the bicycle industry during the first oil shock. However, during the second oil shock that occurred at the beginning of the 1980s, Giant was adversely affected and pessimism came around again. Attempting to lift morale, King Liu wrote in Giant's internal journal, "Without keeping on pedalling, the bicycle will fall down."

4.2 Entrepreneurial learning: from OEM to OBM

Learning is a transformational process of experience. There are two modes of transforming an experience into knowledge: exploitation and exploration. The former is about creating reliability in experience, which means that stable behaviour becomes the dominant state of the learner, while the latter means that individuals learn from experience by exploring new possibilities, including issues such as variation, experimentation, discovery and innovation (Holmqvist, 2000; Politis, 2005). Analogously, OEM is similar to exploiting the profit from routine work, while OBM is the practice of innovation. Both exploitation and exploration are necessary for the growth of the firm.

4.2.1 OEM as the essential sources of growth

The romance with Schwinn stands out as an important episode for Giant to integrate into the international production chain.³⁷ Schwinn started placing orders with Giant in the middle of the 1970s.³⁸ Based on the attractive prices offered, Giant's profits started booming. A turning point came in 1979 when a major strike in Chicago affected Schwinn's production. Schwinn subsequently decided to close its factories in the USA and shifted its production to Giant. At the same time, Schwinn sent technicians to Taiwan to deal with technical problems, which helped upgrade Giant's capacity and increase its total sales (Wei, 2005).

The OEM business not only brought wealth, but also enhanced the production capability for Giant's growth in the initial stage. Even now that Giant has successfully promoted its own brand, OEM still takes up an essential proportion of revenues. To date, Giant's financial statement reports that 25% of its revenues still comes from OEM contracts.

4.2.2 Capability accumulation and OBM initiating

In 1981 King Liu launched the company's own brand name, 'Giant', in the domestic market. The thought of establishing its own brand was stimulated in 1983 when Schwinn's orders accounted for 75% of Giant's total annual output, which also accounted for 70% of Schwinn's total annual imports. The mutual interdependence was compelling. The old saying, 'do not put all your eggs in one basket', kept nagging Liu. He invited Schwinn to distribute a new brand of bicycle, but Schwinn was not interested.³⁹ It was not long before King's uneasy feeling was realised. In 1986, Schwinn announced its plans to invest in China Bicycle Company (located in Shenzhen, China) and switched Giant's orders to it.

As the Chinese saying goes, ‘crisis’ represents both a ‘danger’ and an ‘opportunity’. Liu saw the crisis as an opportunity and quickly expanded the marketing of his firm’s own brand. Liu was fully aware that, to promote its own brand, Giant needed to focus more on R&D and marketing.⁴⁰ With years of investments in finding new and better material, Giant started mass production of the carbon-fibre bicycle frame in 1988. It achieved a market share of one million pieces per annum, and its revenue grew to over US\$36 million. This achievement successfully upgraded Giant’s brand name, and the company has since remained at the forefront of bicycle technology.⁴¹ In 1998 the road bikes that made up the MCR series were considered to be Business Week’s Best New Product.⁴²

4.3 *Sustainable competitive advantage*

To maintain a continuous competitive advantage, a firm needs to improve its capability, which can be enhanced either through external expansion to international markets or by internal reshaping to improve the firm’s management. As suggested by Furrer *et al.* (2004), firms can use product and geographical diversification to build and extend their resource bases, develop organisational capabilities and create distinctive competencies. Through greater economies of scale and scope, greater product and brand differentiation, the creation of entry barriers and enhanced market power, firms can gain a competitive advantage.

4.3.1 *Organisation reengineering*

In order to reshape its internal management, in 1987 Giant adopted the Toyota Production System (TPS), which Giant renamed the Giant Production System (GPS). The goal was to reach ‘8H7D’, which signified that a bicycle has to be finished in eight hours and that the inventory of parts should not be over seven days. The improvement is significant when contrasted with the previous two days of assembly and half a month of holding inventory.

In order to integrate the resources of Taiwan’s major bicycle companies, Giant cooperated with other firms to form the A-Team in 2003 and *purported* to develop a high-value-added bicycle by introducing efficient management skills, such as TPS, to reach the goals of ‘zero inventory’ and ‘just-in-time’ delivery.⁴³ The capabilities of Giant and the members of the A-Team have consequently been significantly accentuated.

4.3.2 *Local ties and global linkage*

Once a firm is growing, its internal knowledge becomes diverse, and its branches spread out all over the world in different locations and different cultures, which are reflected in living habits, social norms and business culture. Using a ‘one-size-fits-all’ operation method to manage each subsidiary located in different countries is doomed to fail. Giant learned a hard lesson when it started to sell its own-brand bicycles in the US market in 1987. Owing to its long-time engagement with OEM, Giant had the disadvantage of being unfamiliar with international management. This inexperience caused the US subsidiary to record a loss for 14 consecutive years.⁴⁴ With strong financial support from Giant’s parent office and the relentless efforts of learning from mistakes, the US subsidiary has started making profits since 2000.

Giant's expansion is currently based on localisation, instead of central control, and two of its slogans state 'Local Success, Global Support' and 'Global Giant, Local Touch'. Up to the present, Giant's bicycles have been sold to more than 50 countries around the world. All the marketing subsidiaries are spread over three continents – Asia, Europe and North America – and their managers are all locally employed (Wei, 2005).⁴⁵

For its global support, Giant consistently promotes its global brand image on the international market, and it started to sponsor Spain's Once Team in 1998. When the Once Team won the team championship at the Tour de France in 2002, Giant was exposed in the international arena as a leading bicycle company. This was the first time that an Asian-made bicycle had won this prize. King Liu realised that, by supporting a bicycle team, a bicycle company could not only improve its quality, but also promote its brand.

4.3.3 International deployment

In 1986 Giant established its first sales office in Europe in the Netherlands and made its international market debut with its own brand, 'Giant'. At the beginning, Giant strategically aligned itself with a reputable Japanese bicycle company, Cogar Miyata, to gain the confidence of European bikers. In response to regional protectionism, Giant established a production base in the Netherlands, aimed at providing high-end bicycles to the European market.

In 1987, the US branch of Giant Corporation was established, and branches in Germany, the UK and France were established in 1988. In 1989, a branch was opened in Japan, but sales did not grow in this highly domestic/brand-loyal country until Giant purchased a 30% stake in the Japanese firm Hodaka in 1998. Since then, Giant has greatly expanded its market share in Japan by relying on Hodaka's mass market distribution channels. In 1991, branches in Australia and Canada were set up.

China joined the global economy in 1978 and its huge market potential has attracted many international companies. Giant joined a venture company with Phoenix (China) in 1993, targeting at producing low- to medium-end bicycles. With the rapid expansion of marketing channels, Giant has established more than 1400 sales distributions in China. With its relatively low labour cost, China has promptly become the main production base for Giant, although the main design house is still in Taiwan.

5 Conclusion

With the widely established modular product architecture in the bicycle industry, Taiwan has availed of the opportunity to create a unique bicycle cooperation structure and to grow from practising production for foreign companies into being able to produce for its own brand. Distinct from other studies on Taiwan's bicycle industry, we focus on entrepreneurship as the protagonist in sketching the development of Taiwan's bicycle industry and analyse how a latecomer firm can evolve into a leading international market player.

We stipulate that four characteristics of Taiwan's bicycle industry help pinpoint why Taiwan has been able to become the kingdom of the bicycle. First, a parallel network, consisting of parts producers, assemblers and foreign buyers, creates a collaborated system, which proves to be so efficient as to out-compete foreign competitors. Second,

having numerous entrepreneurial firms allowed Taiwan to transfer favourably from OEM to OBM. Third, a supportive government with modest but timely intervention bodes well for the development of Taiwan's bicycle industry. Fourth, close relations with Japan and the USA provide not only a large market but also technology transfer for Taiwan's bicycle industry development.

In the case study, we delineate how King Liu manifested his entrepreneurship perspective in Giant Bicycle Corporation. King Liu's vision for the bicycle industry, his pioneering urge to standardise the specifications for Taiwanese bicycles in the earlier stage, and his impetus for establishing an own brand at the latter stage demonstrate the importance of the entrepreneurial mindset for the growth of the firm. Giant's strategy on global deployment helps geographic diversification, while internal organisation reengineering enhances its capability. Both help bring about Giant's continuous competitive advantage. Although the high-tech industry has been the focus of latecomer firms to catch up with advanced countries, we demonstrate that a labour-intensive or non-high-technology industry can be selected as a development strategy. This signifies that for wealth creation and the growth of the firm, what really matters is entrepreneurship.

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Notes

- 1 The dominant design of today's bicycles was institutionalised in the 1890s, and most of the bicycle components have had defined interfaces for over 50 years, making the bicycle industry one of the oldest industries to have international standards for its components. See Galvin and Morkel (2001).
- 2 OEM refers to making products which are sold abroad and bear the brand name of another company. ODM is similar to OEM except that the producer also designs for the buyers, and OBM refers to producing and selling products with the firm's own brand.
- 3 Taiwan's success has inspired many studies on the causes of its growth. A general assessment of the Asian economic miracle based on the neoclassical model can be found in World Bank (1993). In Thorbecke and Wan (1999), an overwhelming number of papers, such as government policy, export promotion policy, human capital creation, *etc.*, contributing to Taiwan's economic success is included.
- 4 According to the Small and Medium Enterprise Administration (SMEA, 2004), in 2003 there were 1 171 780 enterprises (including large firms and SMEs) in Taiwan. With a population of 23 million, every 20th person owns a company.
- 5 Stan Shih founded Acer Corporation with his associates in 1976 and is regarded as the father of Taiwan's PC industry. BenQ was spun off from Acer in 2001, and its chairman and chief executive officer, K.Y. Lee, used to work for Acer. BenQ is a big computer maker, with products including LCD monitors, mobile-phone handsets, digital cameras and notebook computers.
- 6 Specifically, Chu (1997) provides three reasons of why Taiwan has become the leading bicycle producer in the world – namely, the learning capability accumulated from the import-substitution policy adopted by the government in the 1960s–1970s; a favourable environment resulting from the industry's ability to quickly respond in terms of production capability and entrepreneurship; and the globalisation of production resulting from the numerous SMEs helping the network development of the parts suppliers.
- 7 Chu and Li (1996) show that in 1991 in Taiwan's bicycle industry, there were 92 assemblers and 1215 parts producers and most of them had less than employees 100; while in South Korea, there were four assemblers and 62 parts producers. Since 1971, Taiwan's export ratio of all bicycles was over 90% while in South Korea it was less than 50%; Taiwan's parts export ratio was 50% while South Korea's was only 10%.
- 8 The crucial period occurred in the late 1980s when both Japan and Taiwan were confronted with currency appreciation (see the last column of Table 1). While Taiwan's bicycle industry has succeeded in keeping its export markets by means of foreign direct investment (China and Southeast Asian countries) and product upgrades, Japan's bicycle industry has retreated from overseas markets.
- 9 Latecomer firms usually refer to those firms from developing countries whose technology is a laggard behind developed countries. (See Mathews (2002).) Regarding the economic development policy, Amsden and Chu (2003) argue that the government can play an important role through intervention that possibly promotes high-tech firms. Hu and Mathews (2005) further suggest strategies for latecomer countries to catch up to the technological leaders.
- 10 Langlois (2005) argues that Kirzner (1973) is about discovery, about alertness to new opportunities; Knight (1921) is about evaluation, about the faculty of judgement in economic organisations; and Schumpeter (1934) is about exploitation, about carrying out new combinations and creative destruction. Shane and Venkataraman (2000) contend that to date the phenomenon of entrepreneurship lacks a conceptual framework although entrepreneurship has become a broad concept under which a hotchpotch of research is housed. There continues to be a lack of consensus regarding what constitutes entrepreneurship theory and no generally accepted theory of entrepreneurship has emerged. See also the arguments in Alvarez (2005) and Ucbasaran *et al.* (2001), among others.

- 11 Smilor (1997) remarks that entrepreneurs learn from customers, suppliers and especially competitors; they also learn from employees and associates, and other entrepreneurs; and they learn from what works, and more importantly, from what does not work.
- 12 The Austrian market process theory emphasises that normally a market is not in equilibrium. It is through the entrepreneur who discovers the profit opportunity and through his profit-exploiting process that a market can move towards equilibrium. See Kirzner (1973).
- 13 With the endeavour of the Austrian economists, theories linking entrepreneurship with the firm have been blooming since the 1990s. Yu (1999), Lewin and Phelan (2000), and Foss and Klein (2004), among others, all present a similar or at least a conformable theoretical Austrian view, although with differences in stress.
- 14 Tangible assets refer to the fixed and current assets of an organisation that have a fixed long-run capacity. Intangible assets include intellectual property such as trademarks and patents as well as brand and company reputation, company networks and databases. Essentially, capabilities encompass the skills of individuals or groups as well as organisational routines and interactions through which all the firm's resources are coordinated.
- 15 Alvarez and Busentiz (2001) stipulate that resource-based logic has tended to focus on heterogeneity of resources while entrepreneurship theory has tended to focus on heterogeneity in beliefs about the value of resources.
- 16 Ireland *et al.* (2001) predicate that entrepreneurial actions are a behaviour of firms by which they move into new markets, seize new customers, and/or combine (existing) resources in new ways; while strategic actions are taken to select and implement the firm's strategies.
- 17 Ma and Tan (2006) attempt an eclectic account of the poorly defined theory of entrepreneurship and offer the 4-P (perspective, pioneer, practice, and performance) framework to help understand the essence of entrepreneurship. Each P practically matches two entrepreneurial characters, such as purpose and policy, passion and perseverance, persuasion and pursuit, and profit and people, respectively.
- 18 The five bicycle brands and assemblers were Fei-Hu in Nankang (northern Taiwan), Wu-Lien Industrial in Panchiao (northern Taiwan), Freedom in Tainan (southern Taiwan), Fu-Lu in Kaohsiung (southern Taiwan) and Wu-Shun in Taipei. Wu-Lien Industrial was founded by Hsu Shao in 1953.
- 19 In 1953, Taiwan's government started to launch medium-term (usually four-year) plans for national development. Each medium-term plan provided the ensuing infrastructure necessary for the economy as it went through more advanced stages of development. As to knowing how government policies affected Taiwan's economic growth, see Kuo (1999).
- 20 A senior CEO of one Taiwanese bicycle company recalled the common sight of a sign that read 'No sales or servicing of bicycles made in Taiwan' hanging in front of bicycle specialty stores in the USA during that era.
- 21 Taiwan gained the welding technology for BMX through the assistance of the Metal Industries R&D Center. By the 1970s, Taiwanese bicycles were lighter than US bicycles and to protect its domestic market, US customs imposed import bicycle tariffs by weight (under 36 pounds were imposed 5.5% and over 36 pounds were imposed 11%). It gave Taiwanese and Japanese bicycles a chance to penetrate into the US market with lightweight bicycles. At that time, some US dealers wanted to buy BMX from Japan, but the Japanese failed to commit to the promise in the small unorthodox bikes, and an extremely profitable future market was passed on to Taiwan.
- 22 Merida (www.merida.com), one of the leading bicycle companies in Taiwan, was founded in 1972 by D-H. Tseng. The trademark 'Merida' has been registered in 15 countries since 1990. Yuh-Jiun Industry Corporation (www.yuhjiun.com, also called Asama Bicycle, a Japanese name) was established in 1972 by M-T. Fang.
- 23 On average, Taiwan accounted for over 60% of total bicycle imports to the USA during the 1980s. In 1986 the USA became the primary export destination for Taiwanese bicycles with 79% of total exports (see Table 1).

- 24 Shimano Industrial Corporation was founded in 1921 by Shozaburo Shimano and mainly produced the bicycle freewheel. Currently, its product lines include cycling components, fishing tackle and snowboarding equipment. In 2005 the company's total sales were US\$1.4 billion and 75% were from bicycle components. A detailed company profile of Shimano can be found at <http://www.shimano.com>.
- 25 The central part of Taiwan mainly consists of Taichung and Changhua counties, where 44% of assembly firms and 70% of component firms are located in this area. See the analysis in Cheng (1998).
- 26 With decades of experience at OEM, many firms have accumulated the capability to practise ODM. Although ODM is a stage needed before transforming to OBM, it is vague to see when and how the transformation from ODM to OBM can be clearly divided. In reality, both OEM and ODM serve to produce products for other companies' brands. The difference is that ODM shows a higher capability of the firm that has the ability to do the design.
- 27 Table 2 shows that the number of filed patents of Taiwan's bicycle and key components grew in a stable trend, particular for the frame segments. In 1993 the total filed patents surpassed 200, and another surge started in 2000 when it reached over 300. Chang (2004) suggests that Taiwan's filed patents are not concentrated in a few big companies. Instead they show a pattern with wide dispersion, which indicates that R&D has taken root broadly inside the industry.
- 28 Sun Race Inc. (www.sunrace.com) was founded in 1972 by Tony Hsu and specialises in producing the derailleur and gear. KMC Chain Industrial Corporation (www.kmcchain.com) was established in 1977 by Robert Wu and the bicycle chain is its major product.
- 29 The two projects were both run by Taiwan's Ministry of Economic Affairs. For the first project, an executive team called Center Satellites System was established in 1984 to enhance the development of high-value-added products and to help resolve firms' financial problems. The second project focused on developing new materials, which was executed by Materials Research Laboratories (MRL), part of the Industrial Technology Research Institute (ITRI), and involved a two-year project on carbon-fibre bicycle frames from 1985 to 1987.
- 30 The Industrial Technology Research Institute's (ITRI) medium-high end research outcome of key components, like the derailleur system, has gradually transferred to derailleur-specialised manufacturers such as Falcon and Sun Race. Therefore, the import-dependence ratio was significantly reduced to about 35% since 1994.
- 31 In his study of searching out the reason for why Japan's whole bicycle industry has faded away, Sato (1998) explains that Shimano's fierce competitiveness in the international market allows it to survive and become the leading derailleur producer and designer. Conversely, the other parts producers and assemblers confined themselves to the domestic market and eventually lost their competitiveness.
- 32 Mikkola (2002) stipulates that the history of the technological development of the bicycle, since the 1890s to 1990s, illustrates that the bicycle industry has experienced two cycles of disaggregation-concentration. Industry concentration refers to the concentration of the competition in the product category and therefore is an important determinant of vertical integration, while industry disaggregation refers to a horizontal structure and it tends to create fierce, commodity-like competition within an individual niche. Today, the bicycle industry is concentrated around Shimano components, comprising nearly 47% of the bicycle market worldwide.
- 33 As for Giant's success, two other key persons' contributions were involved. One was due to King Liu's elder sister, Yue-Chiao Liu, who constantly offered financial support to help Giant weather its own financial crises; the other was the assistance provided by Anthony Lo, whom Liu met in the second year after Giant was founded. He has been considered to be the best partner that King Liu had with his deft ability to negotiate in international trade (Wei, 2005). For brevity, in this paper we shall focus on King Liu.
- 34 See Giant's company profile at www.giant-bicycles.com.

- 35 In 2003 Giant's brand name was valued at US\$217 million, while in 2004 Giant's brand name was valued at US\$242 million, an increase of 12.7%.
- 36 The name of the company, Giant, was inspired by Taiwan's junior-league baseball team, the Giants, which had just won the world championship.
- 37 Founded in Chicago in 1895, Schwinn grew to become a dominant brand in the US bicycle industry through most of the 20th century. In 1992 Schwinn filed for bankruptcy, and after changing hands in 2004 it was acquired by Dorel Industries, a Canada-based corporation.
- 38 With the persistent endeavours of Antony Lo, Giant's key international salesman, Giant was able to persuade Schwinn's executive vice general manager, Al Fritz, to abandon the perception that Taiwan's products were of low quality.
- 39 At the insistence of King Liu, Schwinn in the end compromised by cooperating with Giant to establish a new company to promote a new brand, whereby Schwinn insisted on holding 80% of the equity in the new company. However, Schwinn backed off in the end (Wei, 2005).
- 40 The annual expenditure on marketing and R&D in Giant is unusually high when compared with other Taiwan's bicycle companies. Giant spends roughly 5% of its annual turnover on worldwide marketing expenses and 2% of annual revenues.
- 41 In the 1993 showcase of excellence of Taiwan's products, the carbon-fibre composite bicycle was awarded a prize as one of the five runner-ups. Currently, Giant is the largest supplier of carbon-fibre bicycles in the world.
- 42 Giant was praised together with Intel's Pentium II, Porsche's New Model and Nokia's Palm Digital Assistant (PDA).
- 43 In 2003, Giant invited its domestic archetypal opponent, Merida, with Taiwan's 11 bicycle parts companies to form the A-Team, with the purpose of increasing the general competitiveness of Taiwan's bicycle industry. The A-Team was intended to take advantage of the collective resources to jointly develop new and high-quality bicycle parts and bike-model-upgrading plans, and to shorten the design and delivery time. With the A-Team's buoyant success, currently there are 21 bicycle parts companies that have participated, and foreign companies such as Trek and Specialised also serve as sponsors.
- 44 One of the reasons is the disadvantage of the 'liability of foreignness' – little knowledge of the local language, culture, laws, business and marketing practices, or customs – which occurs frequently.
- 45 Giant has six manufacturing centres, 11 marketing centres and four R&D centres spread around North America, Europe and Asia. See Giant's company profile at the website, <http://www.giant-bicycle.com/tw>.