

The Structural Transformation and Strategic Reorientation of Japanese Textile Businesses

by M. Asli COLPAN*, Takashi HIKINO**, Masahiro SHIMOTANI***

and Atsushi YOKOYAMA****

I Introduction

Japan's textile industry, with its inexpensive and high-quality labor, enjoyed a competitive advantage for many years over other countries. As a result of the appreciation of yen as well as the growing competition from emerging economies since the 1970s, however, the Japanese textile industry lost its international competitiveness. Imports began to exceed exports starting in 1986, and Japan became a net importer of textile products. In this period, the Plaza Accord of 1985 marked the final transformation of Japan's base of textile businesses into an import industry.

In this historical and economic context, this paper aims to examine the historical and contemporary role of the textile industry in the economic development of Japan, and also to provide the basic analysis of the current process of restructuring taking place within the industries. Furthermore, the paper in the end explores certain strategic solutions for the survival and transformation of Japanese textile businesses, which are of four folds: (1) an increase in knowledge intensity and the enhancement of high technology manufacturing, (2) the expansion of global manufacturing and marketing operations, (3) diversification, particularly for the large enterprises, into non-fiber operations, and (4) organizational adjustments through mergers, acquisitions and strategic alliances among the businesses in the textile chain.

In the paper, the textile industry of Japan is examined in six parts. Following the introductory part, Part 2 examines the historic role of the textile industry in the economic development of Japan. Part 3 aims to investigate the transformation of textile businesses in Japan since World War II. Subsequently, Part 4 discusses why the textile businesses in Japan have faced the current depressed situation, while the other industries have survived and grown in a similar macroeconomic environment. Part 5 aims to revise the possible competitive strategies for the recovery and sustainable growth of the Japanese textile businesses. Finally, Part 6 concludes the paper with an analysis of the schemes for the revival of the textile businesses in Japan.

* Research Associate, Graduate School of Advanced Fibro-Science, Kyoto Institute of Technology.

** Associate Professor, Graduate School of Economics, Kyoto University.

*** Professor, Graduate School of Economics, Kyoto University.

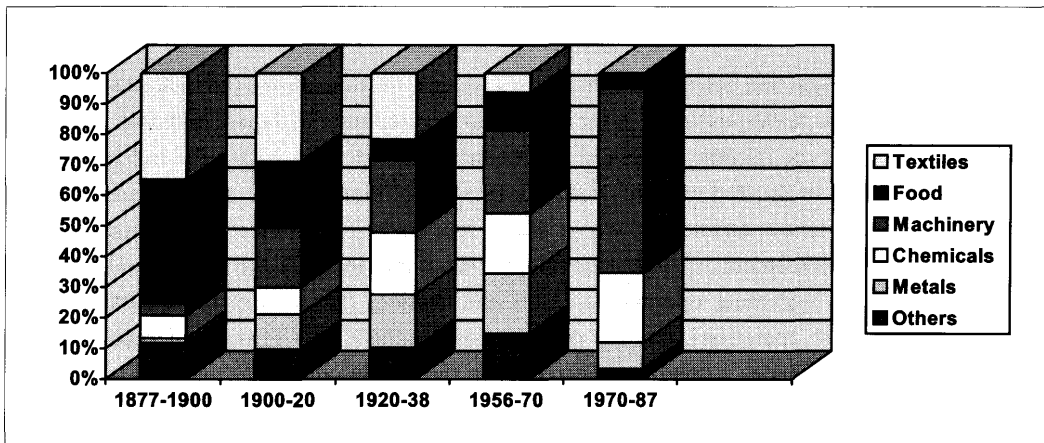
**** Associate Professor, Graduate School of Advanced Fibro-Science, Kyoto Institute of Technology.

II The Role of Textiles in the Economic Development of Japan

The textile industry has usually been the leading sector of nations, which embark upon their industrialization processes, as was certainly the case of Japan. The modern economic growth of Japan commenced in the Meiji Period, while social and economic reforms had started before the Meiji Restoration of 1868. Japan thus began its modernization late with a lower standard of living, compared to today's other industrialized nations [1].

Economic growth of Japan was led by light industries, particularly modern textiles, in the pre-World War II period, and subsequently since the late 1920s by heavy and chemical industries. A secular change from light to heavy industries becomes evident when the industry sectors' relative contributions to manufacturing growth are considered. Figure 1 illustrates the major industry groups' relative contributions to manufacturing growth in Japan. It represents that the textile industry actually had a contribution of as much as 35 percent of the industrial growth before 1900.

Figure 1. Major Industry Groups' Relative Contributions to Manufacturing Growth in Japan

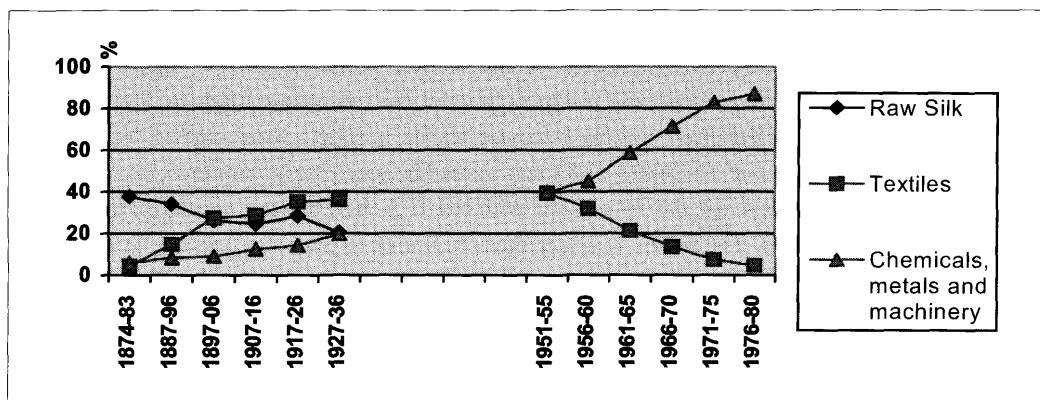


Source: Compiled and calculated from Minami, Ryoshin (1994). *The Economic Development of Japan, A Quantitative Study*, The MacMillan Press Ltd., London, p.100

Note: The figures are for the increase in the real output of respective industry groups divided by the increase in the total real output of all manufacturing industries.

The development of the manufacturing industry in Japan had originally begun with the silk and then cotton spinning industries in the early phases of industrialisation. In its early years of economic development, raw silk was an important commercial export item and a major source to earn foreign exchange for Japan. Moreover, between the years 1874 and 1883, 40 percent of the country's total export earnings were attributable to its raw silk exports (Figure 2).

Figure 2. Japan's Exports of Raw Silk, Textiles, Chemicals, Metals and Machinery



Source: Compiled and calculated from Ippei Yamazawa. *Economic Development and International Trade*, East-West Center, Hawaii, 1990, p.8

Nevertheless, it was not the silk industry to become the driving force of Japan's economic growth, which was due to the limits in domestic demand for luxury silk products, in technological progress, and also in scale economies [2]. It was in fact the cotton textile industry, particularly its upstream spinning branch, which was the first manufacturing industry with large scale operations and the Western technology that played the central role in the economic growth of the country.

The massive importation, adaptation and improvement of the Western technology led the way to the economic development of Japan and the textile industry of the country. The first Western-style cotton spinning mills, such as Kagoshima, Sakai and Kashima Mills, all purchased their machines from England and commenced their operations in the 1860s. Similarly, the first modern weaving technology was imported from France in 1873, which was then improved in Japan [3]. In addition, the leading company in the Japanese cotton textiles, Osaka Spinning, started its operations in 1883 also by importing machinery and equipment from Platt Brothers of Oldham, England. Therefore, the Japanese textile industry achieved the competitive levels of cost and quality through the adaptation and subsequent improvements of transplanted spinning and weaving processes [4].

Once the large-scale textile businesses were established, the import of cotton yarn and cloth started to be substituted by domestic production as early as in the 1880s. Subsequently, the domestic production exceeded imports, and Japan became a net exporter of textiles: in 1900 for cotton yarn, in 1905 for cotton fabrics, and then in the early 1920s for both spinning and weaving machinery [5].

On the other hand, having started its large-scale cotton textile production in the 1880s, Japan began to establish its regenerated fiber (rayon) manufacturing facilities in 1918 to substitute the large imports mainly from Courtaulds of the UK. It was Teijin (Teikoku Jinzo Kenshi) to be the first company to commence the large-scale commercial production in the country, which was then followed by Nobeoka Ammonia Fiber (later Asahi Kasei), and Toyo Rayon (Toray),

established in 1926 and 1931, respectively.

As a result of its drastic growth, in 1933, Japan outperformed the U.K., and was already the leading exporter of the world in textile products. As a consequence of its impressive expansion and extensive participation in world textile trades, some countries began to design protectionist policies to restrict Japanese products to enter their domestic markets. Hence, by the mid-1930s, in 40 of 106 national markets Japanese textile products were curbed [6]. In 1935, then the first voluntary export restraint (VER) was agreed between Japan and the U.S. Nevertheless, neither the restrictions nor the agreement with the U.S. was adequate enough to limit the Japanese textile shipments. The textile industry thus continued to play a major role in the overall growth of the manufacturing sector of Japan until the beginning of World War II.

World War II and its aftermath seriously and adversely affected Japan's textile industry. The war with the U.S. and others meant the acute shortage of imported raw cotton and rayon pulp, on which the Japanese textile industry critically relied. In addition, since the companies were compelled to transform their production to wartime requirements, the total capacity of textile businesses decreased dramatically. For instance, the number of spindles decreased from 13 million in 1941 to 2 million in 1945. In the process of the war, then the manufacturing facilities of textiles got physically damaged. Subsequently, the restructuring of the industry was difficult particularly as a result of poor domestic demand in the post-war years. Nonetheless, with the Korean War of 1950 and the boomed demand for cotton and rayon textiles, the industry survived through military procurement by the UN forces fighting on the Korean Peninsula [7].

Accordingly, Japanese businesses in general gradually recovered in the 1950s and again became serious competitors for the United States and other economic powers. As a result, it was as early as in 1953 that Japan regained its position as the world's leading exporter of textiles. Nevertheless, due to its increasing exports, particularly to the U.S. from two million square yards of cotton material shipment in 1951 to 140 million square yards by 1955, pressures to restrict Japanese imports increased. In 1957, then U.S. industry's pressure escalated and consequently a second VER in the post war was agreed, which limited the Japanese cotton textile exports to the U.S. for five more years [8].

III The Transformation of the Japanese Textile Industry Since World War II

After World War II, the emphasis of Japan's industrial policy gradually shifted from labor- to capital-intensive industries. This change in industrial structure had actually escalated during the war years mainly to produce weapons. Hence, the share of industrial output of the capital-intensive industries (metal, machinery and chemicals) increased from 34.6 percent in 1930 to 76.8 percent in 1945 [9]. The implication of post-war policy reorientations for textile businesses was the promotion of the rapid development of the capital-intensive synthetic fiber manufacturing industry, which was initiated in 1949 by the Ministry of Commerce and Industry, predecessor of MITI. The greater foreign exchange earning potential of synthetic fibers and their expectation to substitute natural and artificial fibers were the factors considered at that time, as there was then just a few countries that could be competitors in this new product field. In addition, for the supply of feedstock necessary for the emerging industry along with the growing demand from

the other chemical-user industries such as automobile manufacturing and electronics, MITI also promoted the development of the petrochemical industry of the country [10].¹⁾

In its 1949 meeting, Ministry of Commerce and Industry permitted only two companies to operate in the synthetic fiber industry. This was due to the government's policy to prevent excessive competition from the beginning of the new industry. Whereas Toray was selected for the manufacturing of nylon, Kuraray, which was originally established in 1926 as a subsidiary of Kurashiki Cotton Spinning, was designated to develop vinylon. As the Ministry's policy favored the original entrants, it eventually created a monopolistic structure for the industry. By the 1960s, however MITI loosened its entry control, and other companies gradually commented their manufacturing of synthetic fibers.²⁾ As a result, the monopolistic structure of the synthetic fiber industry initially changed into a duopolistic one by the entrance of Nippon Rayon and Dainippon Boseki into nylon and vinylon, respectively. Subsequently, Kanebo, Teijin, Toyobo and Asahi Kasei followed suit and diversified into the nylon fiber industry [11]. On the other hand, whereas Toyobo, Kuraray and Nippon Rayon were the companies to pursue the two original entrants Toray and Teijin, in the case of polyester fiber; Toray and Kanebo were the newcomers in acrylic fiber after the three initial entrees Toyobo, Mitsubishi Rayon and Asahi Kasei.

The transformation of the monopolistic and oligopolistic structure into a more competitive one led the way to a rapid increase in the supply of synthetic fibers,³⁾ and consequently prices began to fall. With the economic recession of 1965, the situation became a serious problem. To raise cost competitiveness, the major synthetic fiber enterprises integrated into domestic production of basic raw materials such as xylene and benzene, and adopted the new strategies such as extensive export activities to Asian markets as a substitute to the domestic market. Nonetheless, Japan's synthetic fiber industry could not achieve the stable growth through these strategic reorientations due to the worsening circumstances throughout the 1970s.

The first turning point to Japan's textile industry was another restriction of the Japanese exports to the U.S. in 1971. Similar to cotton textile-export conflicts of the 1950s, the synthetic-exports became a significant international issue. Consequently, Japan was compelled to restrict its exports, which was also due to a political compromise in exchange for the return of the Okinawa Islands to Japan [13].

Second was the currency realignment of 1971 and the transition to a floating exchange rate system. The resulting appreciation of the yen meant that prices of Japanese products in international markets increased, as they were usually contracted in dollars [14].

Third wave of shocks came one after another from the Oil Crisis of 1973 and 1979, which substantially raised the cost of various raw materials energy. Even though the Crisis critically affected the financial performance of the entire textile enterprises in the industry, it was of particular concern to the synthetic fiber industry. Not only because their raw material prices were boosted, but also with the emergence of the First Oil Crisis, the synthetic fiber companies in Ja-

-
- 1) The rising imports of basic chemicals, as their demand couldn't be met at reasonable prices by the coal-based industry, should also be considered for this decision of MITI
 - 2) The expiration of the original patents, and the development of alternative processes for the same synthetic fibers by the European and American companies were the crucial factors to facilitate the entry of a number of Japanese firms.
 - 3) The year 1966 signaled that the production of synthetic fibers exceeded the production of artificial fibers in the country. One year later, the production of synthetic fibers was also higher than that of cotton yarn [12].

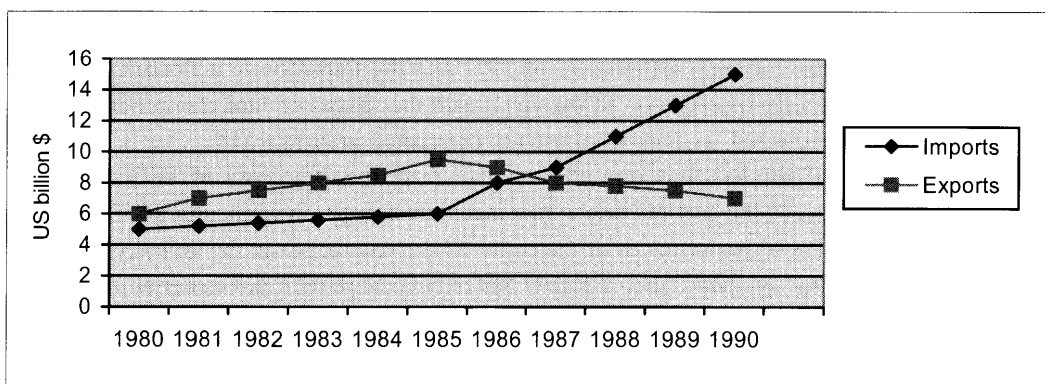
pan increased their productions to respond to speculative demand occurred together with rapidly increasing consumer prices. Nevertheless, the disappearing demand beginning as early as in 1974 caused a drastic oversupply, which was the commencement of the fundamental troubles of the industry.

Besides the general yet critical changes in the macroeconomic environment, another crucial issue for Japan's textile industry in the 1970s was the expanding textile production, and hence growing competition from the newly industrializing countries of East Asia, such as South Korea and Taiwan.

As a result, even though Japanese textile businesses took precautions to survive in the depressed situations, none of the strategies were adequate enough to prevent the further decline in competitiveness in textiles caused by the Plaza Accord in 1985. At the firm level, in response to the impact of strong yen that the international agreement aimed, a common solution for many export-oriented industries such as automobiles and electronics goods was to relocate the production facilities out of Japan. Textile enterprises certainly followed this strategy. In 1988, the number of overseas investments of the textile businesses were already more than three times of the number of investments in 1985 [16]. Furthermore, the major textile companies started to reduce their workforce dramatically as a cost cutting measure, while they introduced new labor-saving technologies and advanced automation. For example, Toray cut its workforce by almost 50 percent from 19,108 employees in 1975 to 10,000 in 1987 [15].

On the other hand, the Plaza Accord, at the economy level, signaled the historic beginning of Japan's permanent transformation to a net importer of textiles (Figure 3). From \$2.4 billion in 1970, Japanese exports of textiles increased to \$6 billion in 1980 and to \$7 billion by 1990. At the same time, the annual value of imports increased from \$1.2 billion in 1970 to \$5.5 billion in 1980 and jumped to \$15.4 billion by 1990 [17]. Hence, from a position of exports being twice imports, imports became around twice the level of exports in a 20-year period.

Figure 3. Japan's Textile and Clothing Trade, 1980-1990



Source: Ministry of Finance, JAPAN

IV Causes and Consequences of Struggles: The Significance of Capital and Knowledge Intensity

Given the macroeconomic and industry-specific troubles that Japan's textile industry faced particularly since the Plaza Accord, an appropriate question to be considered is why the textile businesses have suffered from the chronic depressions, while other industries such as automotives, electric appliances and electronics have survived and grown. The basic nature of problems within the broad textile industry is different depending on the nature of specific industry segments.

The trouble with the conventional textile businesses, which is less knowledge- and capital-intensive among significant industries in a modern economy, is the decline in competitiveness in terms of labor costs, which is the major advantage of emerging economies. The problematic situation concerning the relatively labor-intensive downstream business of apparel and mid-stream businesses of weaving is therefore similar. On the other hand, the circumstances in the upstream fiber and yarn industries, which have also long been struggling to survive against the intense competition from emerging economies, are more complicated. For the natural fiber spinning businesses, this is to some extent comprehensible, as the labor cost advantage is still the main factor for the competitiveness of newly industrializing countries. Nevertheless, the situation is different for the highly capital-intensive manufactured fiber segment.

For the commodity manufactured fiber production, the advantages of the growing Asian businesses arise from the relatively lower capital costs; geographical advantages, that is being close to the large Asian downstream textile businesses; and scale economies in production. The latter is because the emerging nations have established their manufactured fiber businesses after Japan with a larger scale of production. As the capacity stretching is very difficult in the manufactured fiber industry, a newer and larger scale investment by the newly industrializing economies such as South Korea and China meant lower average unit costs compared to those of the Japanese businesses.

In contrast to the commodity large-scale productions, the high knowledge-intensive and non-commodity segments of not only the manufactured fiber businesses such as high-performance fibers, but also textile products including specialty fabrics, have been financially profitable for the Japanese industry. As a result, knowledge intensity (intangible capital) more than labor and capital intensity (physical capital) has become a critical factor to determine Japanese textiles' competitiveness. Although Japan has lost its international cost competitiveness in the labor-intensive segments of textile businesses and even struggles in some of the capital-intensive ones such as the commodity manufactured fibers, it certainly is performing well in the highly knowledge-intensive ones. This means, that the higher the knowledge intensity in non-commodity, high-tech and differentiated products in the textile industry, the more competitive textile businesses in Japan can be in the world markets.

V Strategic Policies for Recovery and Sustainable Growth

As Japan's textile businesses gradually started to lose their international competitiveness, MITI started to come up with some 'Visions' for the recovery of the textile industry. Advisory councils, or shingikai, under the aegis of MITI, formulated the programs with the objective to inform the industry leaders and to give suggestions on the direction that the industry should take. Following with MITI's latest revitalization scheme for the textile businesses, the strategies to adapt to the changing global environment and new market dynamics can be summarized in terms of four major strategies [18].

The first strategy is distinctive product innovations and the usage of sophisticated technology. The Japanese technological superiority means shielding the country's products away from the effects of price competition. This strategy implies the shifting of manufacturing towards knowledge-intensive, proprietary and high functional product categories, such as acrylic deodorizing fiber (by the trademark "seiketsu kazoku") by Toyobo and highly moisture-absorptive nylon filament (by the trademark "quup") by Toray. Thus, by conceptual originality and excellent technological performance, the Japanese textile industry aims to break down the barrier of prices in the global market and survive against the intense competition from the newly industrializing and developing countries.

Second, geographical expansion, which implies the shifting of production sites and the strengthening of marketing organizations throughout the world, has been another significant strategy considered by the businesses. This signifies the relocation, to a large extent, of the labor-cost sensitive segments of textile businesses to low-cost countries, in order to secure a manufacturing base to supply Japanese markets. Having operations in low-cost countries ensures that Japan is able to continue its participation in the general growth in the global markets. Furthermore, companies have also been considering innovative ways to expand their businesses in developed economies such as the U.S. and the U.K. where market needs are different from Japan or Asian countries.

The third strategy, particularly for the large enterprises, is the refocusing and diversification of businesses into product fields with higher margins such as specialty plastic materials and pharmaceuticals, matching changing set of market needs. Large corporations have long been diversifying into technologically related businesses, such as resins and films to achieve cost advantages and produce high value-added products, particularly through the transference of their polymer technology and fiber manufacturing know-how originating from the synthetic fiber businesses. For instance, the companies' diversification into the electronics businesses such as electronic product components including semiconductor coatings and health-care related businesses, such as hollow fiber artificial kidneys and contact lenses are of particular notice. Table 1 illustrates the relative shift from fiber to non-fiber businesses and decline of the textile sales in the total sales of the largest ten corporations.

Table 1. Ratio of textile sales to total sales of the largest 10 textile corporations, 1975-2000

Company	Ratio of textile sales to total sales					
	1975	1980	1985	1990	1995	2000
Toray	77.6%	74.5%	63.2%	55.3%	48.2%	41.0%
Asahi Kasei	58.8%	38.2%	27.6%	17.2%	14.5%	12.0%
Teijin	69.5%	69.7%	71.3%	64.5%	53.7%	53.0%
Kanebo	73.9%	68.8%	56.9%	51.5%	44.8%	30.0%
Toyobo	97.0%	89.2%	82.2%	75.7%	68.8%	56.0%
Kuraray	71.8%	73.0%	69.3%	45.3%	36.6%	31.0%
Unitika	92.0%	80.9%	78.8%	66.4%	51.2%	47.0%
Mitsubishi Rayon	79.5%	60.6%	45.6%	48.0%	46.8%	33.0%
Nisshinbo	81.0%	74.0%	76.0%	67.0%	61.0%	49.0%
Kurabo	91.4%	91.0%	88.8%	76.6%	73.2%	65.0%
Total 10	79.3%	72.0%	66.0%	56.7%	49.9%	41.7%

Source: Compiled and calculated from data file provided by Japan Chemical Fibers Association.

Fourth, and the last, is the structural change, particularly mergers and acquisitions among the enterprises in the textile industry. This may be among large enterprises or small companies, or large and small firms in a horizontal or vertical manner in the textile chain. The main objective of this scheme is for companies to achieve more effective production systems, reduce manufacturing costs and spend more on their R&D activities, and as a result, achieve competitiveness in the global environment.

VI Summary and Concluding Remarks

Cost leadership and product differentiation play the major role for the competitive advantage of firms within a particular nation [19]. Needless to say, cost leadership or cost advantages are achieved when a company becomes a low-cost producer thanks to low labor costs and/or high productivity. On the other hand, as product differentiation becomes an advantage when a firm and its product stand unique in the market, there are non-price factors to be considered, such as product innovation.

For the present textile businesses in Japan, the low cost strategy has no longer been pertinent. This implies the four basic schemes, following MITI's revitalization policies. The production of knowledge intensive, that is proprietary, differentiated and high value-added products such as specialty fibers, high-tech filament textiles and versatile nonwovens, is the basic policy advocated. Nevertheless, since the markets for such specialty products are relatively small, businesses have also been turning their strategies into other directions. While they have been investing in overseas nations and strengthening their global operations, they have also been diversifying into high value-added non-textile businesses such as plastic materials and pharmaceuticals.

On the other hand, structural organization may also be one of the crucial means to

restructure Japan's textile industries. Nevertheless, whereas such horizontal or vertical external growth efforts among large enterprises or big and small companies may generate positive financial results, the competitiveness from such strategy solely among the small firms, most of which are associated with larger firms, would be doubtful devoid of their connections with the large corporations.

In accordance with one of Japan's widely read journals, *Bungei Shunju*, only a numerous number of Japanese businesses seems to survive against the severe global competition [20]. This implies that the Japanese companies that do not take the necessary precautions will gradually disappear from the business arena. Accordingly, in the context of the textile industry, the long run success of Japan seems to depend on a combination of the strategies including strengthening of corporate strategies towards knowledge-intensity, intensification of international operations and effective structural organizations. On the other hand, diversification into non-fiber operations is doubtlessly another crucial path for the survival of the Japanese textile businesses, if not for Japan's textile industry.

References

- [1] Minami, Ryoshin (1994). *The Economic Development of Japan, A Quantitative Study*, The MacMillan Press Ltd., London, UK.
- [2] Yamazawa, Ippei (1990). *Economic Development and International Trade*, East-West Centre, Hawaii, USA, pp.8-64
- [3] Minami, Ryoshin (1994). *The Economic Development of Japan, A Quantitative Study*, The MacMillan Press Ltd., London, UK.
- [4] Francks, Penelope (1993). *Japanese Economic Development Theory and Practice*, Mackays of Chatham PLC, Kent, UK, p.42
- [5] Minami, Ryoshin (1994). *The Economic Development of Japan, A Quantitative Study*, The MacMillan Press Ltd., London, UK.
- [6] Dickerson, Kitty G. (1999). *Textiles and Apparel in the Global Economy*, Prentice-Hall Inc., USA.
- [7] Odagiri, Hiroyuki, Goto, Akira (1996). *Technology and Industrial Development in Japan Building Capabilities by Learning, Innovation and Public Policy*, Clarendon Press, Oxford, pp.110-132
- [8] Argy, Victor, Stein, Leslie (1997). *The Japanese Economy*, MacMillan Press Ltd., London, UK, p.218
- [9] Morikawa, Hidemasa (1999). 'Japan: Increasing Organizational Capabilities of Large Enterprises, 1880s-1980s' in Chandler, Alfred D., Amatori, F., and Hikino, Takashi, eds. *Big Business and the Wealth of Nations*, Cambridge University Press, USA, p.313
- [10] Hikino, Takashi, Harada, Tsutomu, Tokuhisa, Yoshio, and Yoshida, James A. (1998). 'The Japanese Puzzle: Rapid Catch-up and Long Struggle' in Arora, Ashish, Landau, Ralph, and Rosenberg, Nathan, *Chemicals and Long-Term Economic Growth Insights from the Chemical Industry*, John Wiley & Sons, Inc., New York, p.124

- [11] Suzuki, Tsuneo (1999). 'Industrial Policy and the Development of the Synthetic Fiber Industry Industrial Policy as a Means for Promoting Economic Growth', in Miyajima, Hideaki, Kikkawa Takeo, and Hikino Takashi (eds.), *Fuji Conference, Series 3: Policies for Competitiveness Comparing Business-Government Relationships in the Golden Age of Capitalism*, Oxford University Press, Oxford, p.84
- [12] Suzuki, Tsuneo (1994). 'Toray Corporation: seeking first-mover advantage', in Yuzawa, T.(ed.), *Japanese Business Success the Evolution of a Strategy*, Routledge, New York, USA, pp.81-86
- [13] Odagiri, Hiroyuki, and Goto, Akira. (1996). *Technology and Industrial Development in Japan Building Capabilities by Learning, Innovation and Public Policy*, Clarendon Press, Oxford, pp.110-132
- [14] Taniguchi, F. (1991). 'The Economic Outlook for Textiles and Clothing in the 1990s: Developments in the Textile and Clothing Industry in Japan', *Journal of the Textile Institute*, 82, No.2, pp.195-198
- [15] International Directory of Company Histories, Volume 5 (1990)
- [16] Ministry of Finance Statistics
- [17] McNamara, Dennis L. (1995). *Textiles and Industrial Transition in Japan*, Cornell University Press, New York, USA, p.5-62
- [18] MITI Publications, Summary of the Report on the 'Vision of Japan's Textile Industry and Ideal Policies for the Industry' (1998)
- [19] Porter, Michael E. (1985). *Competitive Advantage, Creating and Sustaining Superior Performance*, Collier MacMillan Publishers, London, UK, p.3
- [20] Bungei Shunju, November (1999). 'Reorganization of Japan: Only These Companies Can Survive', in 'Strategies of Japanese Corporations Facing Global Competition: The Cases of Sony and Toray' at <http://project.iss.u-tokyo.ac.jp/kikkawa/iss-6.pdf>, pp. 94-106

Acknowledgement: The authors of the paper, particularly its lead author, Asli Colpan, are grateful to Iwao Nakamura of Japan Chemical Fibers Association for his valuable comments and inspiring criticisms on the earlier drafts of this paper. They also appreciate the assistance and comments given by: Fumikatsu Makino at Toray Industries Inc., Osamu Hasegawa at Kanebo Ltd., Junichi Matsui at Kyoto Institute of Technology, and David Hart at Opus Business Consulting and the University of Leeds.