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Sustainable Management of a Korean Firm: Transformation of the Value Chain in *Cheil* Industries Inc.

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By using a new conceptual model of 'Smile Curve', this research strives to examine how *Cheil* Industries Inc. (CI) has been transforming its value chain to create its competitive advantage. According to the results, CI's value-added structure in the past (conventional industrialization economy) was heavily reliant on the manufacturing sector, and therefore, the profit graph shaped an 'Upside-down Shape of U' indicating that production and manufacturing are the most value-added fields. However, CI's current (knowledge-based economy) graph shows a 'U with Fluent Curve' indicating that R&D, human resources, corporate culture, firm infrastructure, manufacturing, logistics and marketing are simultaneously creating value-added for the company. This implies that CI's value-added source is more diversified to fit with knowledge-based economy.

Keywords: *Cheil* Industries Inc., Competitive Advantage, Knowledge-based Economy, Korean Firm, Samsung, Smile Curve, Sustainable Management, Value-added, Value Chain

I. INTRODUCTION

The ultimate goal of an organization is to pursue sustainable management by creating competitive advantage in a rapidly changing business environment. As the source of firms' competitiveness is perpetually changing with the development of the info-communications industry and technology, companies will be confronted with crises unless they deal with them strategically.

Since the late 20th century, modern society, going through the age of deindustrialization, has been transformed into a knowledge-based economy. As the age of industrial capitalism is converted to a knowledge-led de-capitalism, knowledge is emerging as a new source for the competitiveness of nations and enterprises. While the 20 century was characterized by an industrial society, where capital and labor were the core of production factors, the 21st century is of one of knowledge as the most important production factor.

With this change in the global economic environment, the OECD and the World Bank declared in the late 1990s that the upcoming new social system would be knowledge-based, with a knowledge-led economy. The OECD (1996) defined a 'knowledge-based economy' as economies which are directly based on the production, distribution and use of knowledge and information. Knowledge is now recognized as the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance.

As illustrated in figure 1, most developed countries' value chain has been changed and become more specialized in knowledge-intensive, high value-added activities. Specialization in more traditional cost-based industries and activities is no longer a viable option for most developed countries. For example, the United States' total employment in manufacturing sector in 1970 was around 23%, and it had decreased to 11% by 2003. This implies that the de-industrialization process in manufacturing sector changed rapidly, and that the demand of employment shifted to other industries, such as services, knowledge-related industries, etc.

FIGURE 1. SHARE OF MANUFACTURING IN TOTAL EMPLOYMENT

Kim *et al.* (2009) defined knowledge management to be a management means to enhance a firm's competitiveness by securing and utilizing both external and internal knowledge assets. These authors emphasized the importance of a correlation between existing activities for innovation and knowledge management, as applied to such fields as production, marketing, R&D, human resources affairs and planning.

With the advent of the knowledge-based era, Korea's leading business groups, recognizing that knowledge will be a new source for creating competitive advantage in the future, are quickly preparing for a knowledge-based management. SK and E-Land may be good examples. SK has constructed Knowledge Management System (KMS) and is advocating knowledge management on a group level. E-Land successfully introduced Knowledge Certification System (KCS) and Balanced Score Card (BSC) to carry out knowledge management.

Until recently, a number of studies have been undertaken in the areas of competitive advantage on the one hand and those of knowledge-based economies, knowledge-based industries, and knowledge management on the other hand. However, there has been less work integrate these two areas, while most studies have been carried out with a separate focus. In addition, few studies have been done to identify how Korean firms have been changing their value chain to create, develop and sustain their competitiveness. Addressing the above sets of arguments, this paper attempts to examine i) how a Korean firm has been striving to date to create sustainable competitive advantage by transforming its value chain, and ii) whether or not its current value-added structure is appropriate in a knowledge-based economy. For this purpose, this paper adopts a case study: *Chai Industries Inc. (CI)*, one of the main affiliated companies of Samsung Group.

This paper consists of five sections including this first part, which is the introduction. The structure of the rest of this paper is as follows. The second section reviews previous literature on the changing process of the source of a firm's competitive advantage. The section will also present a theoretical model and construct a research framework. The third section will examine the research and data collection methods used in this study. The fourth section presents an analysis of the data and the results. Finally, the fifth section explores some implications and limitations.

II. LITERATURES AND THEORETICAL MODEL

The ultimate goal of any organization is to create competitive advantage through strategic management. The earliest theories of strategic management were influenced by Simon (1976, 1979) and Cyert and March (1963), who emphasized

the importance of the decision-making process and the role of the manager. Then, theories shifted from inside to outside, and back to the inside of an organization again, emphasizing human resources, core competence, capability, corporate culture, knowledge, etc. Since then, people have started to pay special attention to knowledge, and it has become one of the most important elements that produce a firm's competitive advantage.

To construct a research framework, this section reviews previous literature on the source of the firm's competitive advantage, and how the sources were changed to date, from an industrialized society, through to deindustrialization and to a knowledge-based society.

1. Competitive Advantage in Conventional Industrialization Economy

The roots of competitive advantage can be found in FDI theory. The theoretical base of competitive advantage in FDI theory began with Hymer (1960) and Kindleberger (1969), who used the phrase 'monopolistic advantage'. Dunning's (1980) eclectic theory identified that a firm will engage in FDI if the following three conditions are satisfied: ownership-specific advantage (O), location-specific advantage (L) and internalization (I).

In the mid 1980s, Porter (1985) argued that the source of a firm's competitiveness springs from its specific competitive advantage, which exhibits one of two possible basic types: low cost and differentiation. These two basic competitive advantages originate from a firm's activities and linkages within the value chain. Through optimization, configuration and coordination within the value chain, a firm is able to achieve low cost and differentiation advantages.

As the source of competitive advantage is continuously changing, global management strategy theory presents the concept of a firm's strategic management in a changing environment. Kogut (1985) established a global management strategic theory by combining comparative advantage (i.e. a country-specific advantage) with competitive advantage (i.e. a firm-specific advantage). Bartlett and Ghoshal (1998) looked at multinational enterprises which used integrated networks perspective as a means of building competitiveness. By using integrated networks (networks with each specialized unit linked to the others worldwide), a firm can achieve the multidimensional strategic objectives of efficiency, responsiveness, innovation and competitive advantage.

Since the 1980s, people have started to pay attention to the internal resources of a firm, and this has stimulated the emergence of resource-based theory. The idea of looking at firms as a broader set of resources goes back to Penrose (1980), who saw a firm as 'flesh and blood', consisting of human and non-human resources under administrative coordination and communication. Barney (1991)

argued that a firm's resources must have four attributes for creating sustainable competitive advantage: value, rareness, imitability, and substitutability. Mahoney and Pandian (1992) also looked at the concept, arguing that a firm's distinctive competence can create competitive advantage. Johnson *et al.* (2005) went further with unique resources and core competences to see the concept of competitive advantage for a firm. Unique resources are those which critically underpin competitive advantage, whereas core competences are activities or processes which critically underpin a firm's competitive advantage. Enz's (2008) case study suggests that firms, in order to sustain competitive advantage, must manage and blend the following resources together: financial resources, physical resources, human resources, organizational knowledge and learning, and general organizational resources.

2. Competitive Advantage in Knowledge-based Economy

With the advent of knowledge-based society, there have been active studies to analyze a firm's new source of competitive advantage: investment in R&D, intellectual capital (Kefela, 2010), discriminatory knowledge (Toffler, 2006), and differentiated technology, premium brand, and strong corporate culture (Song, 2011), etc.

The term 'knowledge-based economy' was coined by the OECD in 1996, and this was reflected in the trend in OECD economies towards growth in high-technology investments, high-technology industries, more highly-skilled labor and associated productivity gains. According to the OECD (2005), investment in knowledge (comprising expenditure on R&D, software and higher education) in the OECD area reached around 5.2% of GDP in 2001, compared to around 6.9% for investment in machinery and equipment. In 2003, Sweden had the highest R&D intensity (4% of GDP), followed by Finland, Japan and Iceland (all over 3% of GDP).

Alvin Toffler (2006), in his work of 'Revolutionary Wealth', emphasized that the wealth in the 21st century would be possessed by individuals, nations, or enterprises that could occupy discriminatory knowledge which enables them to create customer value. According to what Toffler said, knowledge is the key foundation for wealth creation, and it will overcome the limitedness of supply, transforming itself into a gigantic and powerful economic resource. The importance of knowledge was also suggested by Kefela (2010), who claimed that new ideas or intellectual capital are the new keys to prosperity and to the wealth of nations. In addition, Song (2011) emphasized the importance of differentiated technology, premium brands, and strong corporate cultures. Here, 'The Law of Increasing Returns' can be applied to knowledge-related

industries, while ‘The Law of Diminishing Returns’ can be applied to the conventional industrial economy.

Table 1, provided below, summarizes the previous literatures on the source of competitive advantage, and it shows how the sources have changed over time.

TABLE 1. THE EVOLUTION OF STUDIES ON COMPETITIVE ADVANTAGE

Author (s)	Theory	Main Arguments
Hymer (1960); Kindleberger (1969); Dunning (1980); and Wells (1983)	FDI Theory	<ul style="list-style-type: none">- Monopolistic advantage- The ability to differentiate products, marketing skills, retail price maintenance, superiority of management and economies of scale- Ownership-specific advantage (O), location-specific advantage (L), and internalization (I)
Porter (1985)	Generic Strategy Theory	<ul style="list-style-type: none">- Generic strategies (low cost, differentiation)- Value chain (optimization, configuration, and coordination)
Kogut (1985)	Global Management Strategy Theory	<ul style="list-style-type: none">- The combination of comparative advantage and competitive advantage
Bartlett & Ghoshal (1998)		<ul style="list-style-type: none">- Utilizing integrated networks
Penrose (1980)	Resource-based Theory	<ul style="list-style-type: none">- A firm is “flesh and blood”, consisting of human and non-human resources.
Barney (1991)		<ul style="list-style-type: none">- Value, rareness, imitability and substitutability
Mahoney & Pandian (1992)		<ul style="list-style-type: none">- Distinctive competence
Johnson <i>et al.</i> (2005)		<ul style="list-style-type: none">- Unique resources & Core competences
Enz (2008)		<ul style="list-style-type: none">- The combination of five resources (financial, physical, human, organizational knowledge, and general organizational resources)
OECD (1996)	Knowledge-based Theory	<ul style="list-style-type: none">- Knowledge has always been central to economic Development (The driver of productivity)
		<ul style="list-style-type: none">- Means of achieving vision- The characteristics of knowledge : invisibleness, limitless, borderless, co-existence, and non-aging
<ul style="list-style-type: none">- An era of time, space and knowledge- Limitless of knowledge supply		
SERI (1999)		<ul style="list-style-type: none">- Intellectual capital is the new keys to the wealth of nations (and firms)- Knowledge becomes the key driver of competitive advantage, and economic development.
Toffler (2006)		<ul style="list-style-type: none">- Smart management based on knowledge- The need of differentiated technology, premium brand, strong corporate culture, etc.- Increasing returns (e.g. BT, NT, IT, CT, etc.)

3. Theoretical Model

A number of studies have been carried out to identify the source of a firm's competitive advantage, and the sources gradually changed over times. Based on the previous literature, this study adopts the 'Smile Curve' model, as a theoretical framework, to examine how CI has changed its value chain to generate its competitive advantage.

A 'Smile Curve or Complete Shape of U' is an illustration of value-adding potentials of different components of the value chain in an IT-related manufacturing industry. Since the shape of this graph looks like a human's smile, it is called 'Smile Curve'. This concept, then, is widely extended later by many scholars to describe the distribution of value-adding potentials in various industries, and to justify business strategies aimed at higher value-adding activities. This model indicates that R&D, technical development, strong human resources, unique corporate cultures, and marketing activities are creating more value-added rather than manufacturing and production.

FIGURE 2. THEORETICAL MODEL: SMILE CURVE CONCEPT

To clarify the research objectives, this paper assumes that CI's value-added structure in the past was heavily depend on the manufacturing sector, showing an 'Upside-down Shape of U' indicating that production and manufacturing are the most value-added areas. Then, the shape of value-added grape will show progressive changes, showing a 'Straight Line', and finally 'U with Fluent Curve' which indicates that R&D, human resources, corporate culture, manufacturing, firm infrastructure, and marketing/service are creating value-added simultaneously.

III. RESEARCH FRAMEWORK

1. Research Objectives

Despite many studies on competitive advantage and its relevant areas, there has been less work to examine a firm's change in value chain to produce and sustain its competitiveness. Moreover, less work has been done to investigate how a firm transforms its strategy, policy or structure to fit with the knowledge-oriented society.

With this in mind, this research strives to investigate how CI has been striving to date to create sustainable competitive advantage by transforming its value chain, and to examine whether its present value-added structure is suitable for the modern knowledge-based society. This paper, therefore, explores a new area of management studies by including an integrated insight into the areas of competitive advantage and the knowledge-based economy.

2. Method

This paper adopts a case study. The case study entails the detailed and intensive analysis of a single case (Bryman, 2004). It, therefore, has strength in conducting the process of research on particular organizational and strategic changes (Van de Ven, 1992).

By applying the 'Smile Curve' model, I examined longitudinally how CI has been changing its value chain until today to create and intensify its competitive advantage. There are several reasons to choose the aforesaid firm for this research. First, the company has been achieving significant success to date by transforming its organization, line of business and value chain since its foundation in 1954. Second, the company provides an adequate package for research, for example, its management system, business scale, strong brand power, relationship with Samsung Group, etc. Third, the firm is one of the Korean companies listed on the Korea Stock Exchange, and it ranked 49 (total market value base) in KOSPI out of 200 items as of July 10, 2012, recognizing it as one of the recommended firms in which to invest. (Korea Stock Exchange, 2012)

As a result, an examination of the CI case is appropriate both to better understand Korean business groups' endeavor for sustainable management, and to suggest the guideline how other firms can formulate their management strategies under the knowledge-driven societies of today.

3. Data

Data for this research are derived from secondary materials. Secondary analysis

offers numerous benefits to researchers carrying out a research projects – saving cost and time, providing high quality data, giving an opportunity for longitudinal analysis, enabling subgroup analysis, etc. (Bryman, 2004).

Within this research setting, I examined large volumes of archival documents including annual and quarterly reports, internal reports and periodicals, financial statements, statistical and historical data issued by CI. Data have also come from various books, newspaper articles, journal articles, and research reports released by private research institute, such as Samsung Economic Research Institutes (SERI), POSCO Economic Research Institute (POSRI), etc. CI's financial data were obtained also from DART (Data Analysis, Retrieval and Transfer System) provided by Korean Financial Supervisory Service.

IV. ANALYSIS: A SHIFT OF VALUE CHAIN CURVE

Every firm is a collection of activities that are performed to design, procure, market, deliver, and support its product, and all these activities can be presented using a value chain (Porter, 1985). The value chain is a basic tool for diagnosing competitive advantage and finding ways to create and sustain it. This section reviews and analyzes how CI has changed its value chain until today.

Since its foundation in 1954 with a fabric business, CI has been accomplishing remarkable business success by transforming its organization and entering into new businesses, such as fashion business in the 1970s, chemical business in the 1980s, and electronic material business in the 2000s.

Starting with a US\$100 million Export Tower in 1989, CI was awarded, selected, or won various prizes and certificates. To list some examples, the company was selected as one of the 100 Best Quality Manufacturers in 1997; won the World Best Award by the Korean Management Association in 2000; received ISO14001 Certification for its Environmental Management System in 2004; won the Grand Prize in the Korea Marketing Awards in 2005; recorded the Best Business Performance in 2006; accomplished 19 times of no-disaster goal (37,950,000 hours) in 2008; and received IR52 *Jang Young Shil* Award for 'PDP Electrode Photo-sensitive Paste' in 2011, respectively.

As of December 2011, CI's total assets were KRW4.93trillion (equivalent to about US\$4.28billion), total sales were KRW5.58trillion (equivalent to about US\$4.85billion), and gross profit was KRW3.99trillion (equivalent to about US\$3.47billion).

In this section, by applying the 'Smile Curve' model, I attempt to analyze CI's business transformation process for developing its competitiveness, and examine how its value chain curve has been shifted to date.

1. The 1st Phase (1950s~1970s): Focusing on Worsted Wool Spinning and Synthetic Fiber

In September 1954, CI was established in the name of *Cheil* Woolen Fabrics Industries with a capital KRW100million. The company, in May 1956, produced the first ejected yarns, which were a one-thread ply yarn and a two-thread ply yarn of a metric 18-yarn count. The company, back then, exported its first batch of 8,000 pounds of carded wool to Hong Kong in 1961, and it obtained a Korean license for Wool Mark in 1965, respectively. By diversifying its line of business into spinning, weaving, wool carding and dyeing, the company focused on worsted wool business by the end of the 1960s. (*Cheil* Industries Business Report, 2011)

From the end of the 1960s to the early 1970s, CI transformed to an assorted fibers manufacturer, and it began business operations in synthetic fibers and clothing products. This was because that the concept of business diversification became common due to the slow growth of the global woolen fabrics industry. From the end of the 1960s, the company started to produce chemical fibers made of polyester and rayon, and at the same time it launched a clothing business by producing various brands for students, such as Elite, Eston and Lala. (*Cheil* Industries Business Report, 2011).

Meanwhile, it is essential to understand Korea's general economic environments at the time of the 1960s and the 1970s. Korea's rapid economic growth began after the launch of the military government headed by *Park, Chung Hae*. After his inauguration, the government immediately concentrated on the national economic development as its priority. With a preferential treatment by the government, Korean *Chaebols* were able to achieve quantitative expansion and diversification during the period of Five-year Economic Development Plan (1962~1981). In particular, there was an impetus in the early 1970s for the accelerated growth of Korean *Chaebols* with the government's policy emphasis on heavy and chemical industries. During the third Five-year Economic Development Plan (1972~1976), Park's government tended to achieve economies of scale. It, therefore, focused on a small number of the *Chaebols* with preferential financial assistance, and it designated heavy and chemical industries (e.g. steel, petrochemicals, machinery and shipbuilding) as 'strategic industries'. From 1975 to 1979, the Korean government allocated 70% of its economic development funds to these industries. According to Chang (2003), the Korean government allocated licenses to only a few *Chaebols* in order to achieve economies of scale. As a result, from 1971 to 1979, the proportion of heavy equipment and chemical industries to total manufacturing shipments increased from 39% to 55% while the proportion of exports to GNP increased from 16% to 36%.

Following this economic trend, the Samsung group launched petrochemical

business, and Samsung Petrochemical Co., Ltd. was established in 1974. Since then, CI was more able to focus on synthetic fiber and clothing businesses by receiving stable raw materials from Samsung Petrochemical Co., Ltd., and it achieved a remarkable business growth.

Putting data and information together, CI's value-added structure on its value chain in the 1st phase was heavily reliant on manufacturing sector, focusing on worsted wool spinning and synthetic fiber, rather than R&D, brand power, technical innovation, effective logistics or marketing. The figure 3 given below outlines these profit structures.

2. The 2nd Phase (1980s):Diversifying into Non-fiber Sectors

Entering the 1980s, CI recognized the necessity of business diversification into non-fiber fields as the synthetic fiber industry encountered limitations of its further growth. The company, therefore, organized a new business team in 1987 for beginning the chemical industry. Since then, the company derived momentum for growth in chemical sector with a clear-cut vision, well-systemized organization, and strong leadership.

On June 1987, CI had reached a contract with Mitsubishi Rayon, Japan to adopt ABS (Acrylonitrile Butadiene Styrene) resin technology, and, on December at the same year, adopted PS (Polystyrene) resin technology from Mitsubishi Monsanto, Japan. The aggressive investment in chemical sector continued since then. The chemical R&D center was founded in 1988, and chemical plant was established in *Yæsu* Petrochemical Complex in 1989, respectively. By taking advantage of its cutting-edge technologies, CI has continued its R&D activities to create new values, thereby becoming a leading resin manufacturer, producing various functional chemical resins, such as ABS, PS, SAN, EPS and EP. The company, as a result, was awarded a US\$100million Export Tower in 1989 from the Korean government.

In the 2nd phase, almost like in the 1st phase, CI's main value-added source on its value chain was manufacturing sector. Although CI diversified its business into non-fiber sectors in this period, the effect of aggressive investment in new technology adoption and R & D had not impacted the CI's value-added structure within the short period of time. As a result, the curve of value chain in the 2nd phase showed almost identical shape as in the 1st phase.

FIGURE 3. THE CURVE OF THE 1st AND 2nd PHASES

NOTE: The value chain curve in the 1st and 2nd phases (1950s~1980s) was not based on the CI's factual financial data, but relied on the non-financial data (e.g. a handbook of 'corporate history') as the author was not able to obtain CI's old financial data.

3. The 3rd Phase (1990s): Rebuilding Organization : From Corporate Culture through Management Infrastructure to Businesses

The overall environment in the early 1990s was unfavorable to business firms both internally and externally. As the economic conditions of Korea had been worsening due to sluggish domestic demand, poor exports, and full-scale trade pressure from developed countries, Chairman Lee conceived the idea of innovation in the Samsung group, including CI, in order to become a global leader. He called out all executives together in Frankfurt, Germany, and announced a 'New Management', also called 'Frankfurt Announcement' on June, 1993, asking all employees to change their thinking, attitude and behavior. At that time, he imprinted his famous words on people's minds: "Change everything except for your wife and children." After Lee's announcement, the 'New Management' program was implemented omni-directionally throughout the Samsung group.

From the corporate culture perspective, the Samsung group, including CI, adopted an early attendance to the office system, also called '7.4 system' in order to reform the existing working culture, which had been traditionally dominating across the business firms, societies, and nations. Lee also emphasized the necessity of 'Knowledge-based Management/Talented-person Management' by recruiting highly qualified persons not only from domestic but also from foreign countries. Then, the HRM team strategically managed human resources by classifying them as two groups: S (Super) and H (High Potential) classes. (Lee *et al*, 2002).

From the management infrastructure perspective, Samsung group exerted to establish business infrastructure for the cost-effective management. Samsung

Electronics, for example, invested approximately KRW700billion from 1993 to 2001 for the successful completion of Enterprise Resource Planning (ERP) system, which integrates internal and external management information across the entire organization, embracing manufacturing, finance, human resource, logistics, etc. In order to walk in step with the group's policy, CI also introduced ERP system in 1999 ties with Supply Chain Management (SCM), Customer Relationship Management (CRM), and Product Data Management (PDM). The successful adoption of ERP system (SAP R/3) enabled CI to facilitate the free flow of information between/among all business units, and all employees became used to sharing real-time information within the organization.

From the business activities perspective, CI started to invest in new business areas for the next century. First, based on its extensive experience and knowledge accumulated in the textile business, CI diversified its business into fashion sector by launching its first men's wear named 'Bean Pole' in 1989. Since then, in the 1990s, CI established a fashion R&D center in conjunction with Samsung Corporation, and started full-fledged investment in the fashion business by diversifying its business portfolio into various fields: casual wear, ladies' wear and sporting wear, aiming at 'Total Brand' that covers all fashion sectors. In addition, as a part of its business restructuring program, CI, as the first Korean firm in fashion industry, adopted the Just-in-Time (JIT) system, and it significantly facilitated production efficiency by reducing lead time (from product planning through purchasing to production) in the entire manufacturing process. Second, CI also invested in Electronic Chemical Material (ECM) business in 1996 with the development of Epoxy Molding Compound (EMC), which is a protection material of a semiconductor's circuit from various external environments. Then, CI expanded its electronic materials into display materials, material for secondary batteries, and functional materials.

TABLE 2. CI's SALES AND R&D ACTIVITIES IN THE 3rd PHASE

		(Unit: KRW million)		
		1999	1998	1997
Sales	ECM	26,966	18,487	13,024
	Chemical	552,162	559,228	443,737
	Fashion	535,782	251,540	318,389
	Fiber	193,290	141,672	234,074
	Others	13,617	1,191	609
	Total	1,321,817	972,118	1,009,833
R&D	R&D Expenditure	24,467	17,431	17,818
R&D Organization (1999)	Name	No. of Researcher		Contents
	General Research Institute (RI)	128		- New product/technology development
	Production & Technology RI	29		- Product analysis
				- Production process development
	Fashion RI	15		- Fashion trend analysis - Market survey

SOURCE: DART

In the 3rd phase, CI's value-added source was much diversified into other areas as compared to the 1st and the 2nd phases. In 1999, the ECM business accounted for 2.04%, chemical business took 41.7%, and the fashion business represented 40.5% out of total sales. Notably, the share of fiber business has dropped considerably, and it accounted only for 14.6%. The total R&D expenditure was KRW24,467million, and there were four research institutes as of 1999.

Investment in R&D and human resources, reformation of corporate culture, and establishment of the firm's infrastructure did not visibly and immediately impact the corporation's value-added element. However, it is widely assumed that these corporate transformations have not only have secured CI's competitiveness in the long-term but have also become a base of its future potential profit or its value-added element. As a result, the situation of the 3rd phase can be illustrated as figure 4, showing the curve was slightly changed from the previous one.

FIGURE 4. THE CURVE OF THE 3rd PHASE

4. The 4th Phase (2000~2007): The Period of the Second Jump-up

Entering the 21st century, CI officially changed its main business lines to chemical products and Electronic Chemical Materials (ECM) from fiber products. One of the major reasons for changing the business line was that the sales volume of the chemical products at that time was accounted for nearly 50% of the firm's total sales. The sales of chemical products in 2007, for instance, accounted for 49.8%, followed by fashion (36.0%) and ECM (14.2%).

CI considered the era of new millennium as a second take-off period based on well-balanced business portfolio: chemical, fashion and ECM. The first attempt of CI was to build a digital world by constructing a mass-production factory for ECM in Gumi on January 2002. CI's ECM business unit, then, acquired KOSDAQ-listed firm of Ace Digitech in 2007, and began a polarizing film

business, which is a core component of Liquid Crystal Display (LCD) panels. In order to secure a competitive edge for the company along with next-generation profit sources, CI decided to invest in a new business area of ECM with a foresight of growth potential of the IT industry.

CI also tried to enhance its brand power in fashion sector through strategic marketing activities. Having consistently led Korean fashion market, Bean Pole, for example, pursued a differentiated marketing strategy with a high-quality and unique design (Joo, *et al* 2008). Not having age/gender limitations, ranging from teenagers to the age of 50s, Bean Pole introduced various sub-brands, such as Bean Pole men's wear, ladies' wear, golf wear, jean and kids, and became a family brand with strong brand power in domestic market which was creating a new lifestyle. FUBU, a brand launched in the U.S.A in 1992, has become one of the famous global brands, and it is currently sold in around 60 countries worldwide. As a result, CI won the high-end brand award (for its Bean Pole brand), and the high-end design award (for its Galaxy brand) at the Korean Marketing Awards held on May 2006.

While transforming its main business lines, CI placed special emphasis on the importance of innovation activities. CI continuously sharpened its competitive edge through a variety of innovation activities such as 6-sigma and Total Productivity Management (TPM) in order to sustain its competitiveness. CI, for instance, adopted the 6-sigma system in 2002, and employees were implementing approximately 550 missions per year, achieving around KRW60billion in annual financial results. The *Yosu* chemical factory successfully completed the 7th step of TPM in 2007, and the *Gumi* ECM plant adopted the new TPM system and aimed at achieving a 50% reduction in unit expenses, doubling its productivity along with improving the quality of its 6-sigma program. In addition, by connecting 6-sigma and Process Innovation (PI), CI built an innovation infrastructure in 2007 to enhance Supply Chain Management (SCM), Manufacturing Execution System (MES) and R&D systems. Thanks to these activities, CI's financial results of innovation initiatives in 2007 accounted for KRW97.8billion. (*Cheil Industries Business Report*, 2011).

In order to strengthen SCM, logistics and transportation sector, CI adopted RFID (Radio-frequency Identification) technology in 2005 to improve work efficiency and overcome the weakness of the existing barcode system. RFID is technology of a wireless non-contact system that uses radio-frequency electromagnetic fields to transfer data from a tag attached to the products, for the purpose of automatic identification and tracking. For instance, attaching RFID tag on each piece of clothes in Bean Pole outlets, this system can make it possible to get hold of the amount of stocks for each floor and of stocks moved between floors using a portable reader and provide better service to customers through product searching service.

By implementation of RFID system, CI was able not only to manage the supply chain, distribution centers, warehouses, outlets and inventories concurrently, but also to shorten working time of the products' warehousing and delivering. Thanks to this, CI received the Presidential Prize in RFID on April, 2009 (*Maeil* Economic Newspaper, 2009).

In the beginning of the new millennium era, CI's value-added source was much diversified into other areas with the well-balanced business portfolio: chemical, fashion and ECM, even changing its main business lines. In addition, CI constructed an innovation infrastructure for accomplishing considerable cost reduction and quality improvement. The curve in the 4th phase can be illustrated as figure 5, moving to the reverse direction from the 3rd phase.

5. The 5th(2007~):Aiming at being a Global Leader

Since the middle of the 2000's, CI has jumped into the knowledge-based society by utilizing all of its capabilities such as R&D, strong human resources, core competence, logistics, management infrastructure, and marketing activities. It denotes that CI's value-added structure is much more diversified into other areas as compared to the past

TABLE 3. CI's SALES, R&D AND INNOVATION ACTIVITIES IN THE 5th PHASE

		(Unit: KRW million)		
		2010	2009	2008
Sales	Chemical	2,230,499	1,827,197	1,773,482
	ECM	1,409,756	1,209,398	815,108
	Fashion	1,298,437	1,141,556	1,047,706
	Others	79,902	82,945	91,487
	Total	5,018,594	4,261,096	3,727,783
R&D	R&D Expenditure	131,111	107,070	89,021
R&D Organization (2010)	Name	Number of Researcher		Contents
	Chemical Research Institute (RI)	186		- New product/technology development
	Process Material RI	175		- Semi-conductor material development
	Film Material RI	141		- Film material development
	Fashion RI	11		- Fashion trend planning
				- Fashion Market survey
	Others	69		
		(Total 582)		
	Area	Number		Remarks
	Domestic	1,530		
Patent (2010)	Overseas	450		- Innovation Activities
	Total	1,980		
	Area	No.		Remarks
Trademark (2010)	Domestic	73		
				- Innovation Activities

SOURCE: DART

As indicated in the table 3, CI's, in particular, investment in R & D has been increasingly grown in the 5th phase, amounting KRW131,111million (equivalent to about U\$120million) in 2010, KRW107,070million (equivalent to about U\$97million) in 2009, and KRW89,021million (equivalent to about U\$81million) in 2008, respectively. The number of personnel in research field in 2010 was 582, which has increased by 216% compared to 1999 (i.e. 184). The number of patent and trademark, which is highly associated with innovation activities in CI's value chain, obtained both in domestic and international market was 1,980, and 320, respectively. It implies that CI's value-added structure is much more diversified into other areas as compared to the past.

As a result, in the 4th and 5th phases, the value chain graphs show quite different shape from those in the 1st and 2nd phases. In the 1st and 2nd phases (i.e. conventional industrialization society), the graph showed an 'Upside-down Shape of U' indicating that such fields as production and manufacturing are the most value-added fields. On the contrary, in the 4th phase, the graph shows a straight line, then, in the 5th phase (i.e. knowledge-based society), the curve shows a 'U with Fluent Curve' indicating that R&D, technical innovation, strong human resources, unique corporate culture, firm infrastructure, manufacturing, logistics and marketing are creating value-added simultaneously.

FIGURE 5. THE CURVE OF THE 4th AND 5th PHASES

Considering the characteristics CI's business lines, the shape of value-added graph, however, will not show a 'Complete Shape of U or Smile Curve' in the future, because the concept of the smile curve was originally been developed to explain the value-adding potentials in an IT-related industry; therefore, it

is widely used in many industries. For this reason, there would be a structural limit of showing the ‘Smile Curve’ for manufacturing-oriented firms like CI. Even though CI’s value chain graph may not take a ‘Complete Shape of U’ in the future, it seems that the structure of value-added has already been formed appropriately for the knowledge-based economy.

V. CONCLUSION

This paper uses a new conceptual model of the ‘Smile Curve’ to better understand how a Korean firm has been transforming its value chain to create its competitive advantage across the decades until today. The model is illustrated through a comprehensive analysis of CI, one of the main affiliated companies of the Samsung group.

The case analysis result shows that CI’s value-added structure in the period of the conventional industrialization economy relied heavily upon the manufacturing sector, showing a graph of ‘Upside-down Shape of U’ in its value chain. However, in the period of knowledge-based economy, CI’s value-added structure became much more diversified into other sectors: R&D, human resources, corporate culture, firm infrastructure, manufacturing, logistics and marketing, showing a graph of ‘U with Fluent Curve’. Although the shape of CI’s value chain curves may not exactly accord with reality, the result of this study shows the changing trend of CI’s value chain as time passed. One notable thing is associated with CI’s emphasis on R&D, HRM, reformation of corporate culture, and establishment of firm infrastructure. Even if investment in these sectors may not impact on CI’s value-added structure immediately, such investment may lead CI’s international competitiveness in long-term perspective.

In conclusion, CI has been changing its value chain successfully and strategically over time from manufacturing through business diversification to R&D, technical innovation, infrastructure building and marketing activities. As a result, CI’s current value-added structure seems to have a great potential that enables it to generate its own competitiveness in the knowledge-base economy.

1. Implications

Substantial data and information about CI have been examined in the literature and the secondary data. As a result, this paper makes several contributions to the field of sustainable management, and some implications may be observed as follows.

First, based on the earlier theories on firm’s competitive advantage, this paper uses a new framework to better understand how a firm has been obtaining its competitive advantage since its foundation. There is an academic meaning

in this study because this paper longitudinally reviewed how a firm has changed its source of value-added through strategic management, while most existing studies simply reviewed the source of competitiveness at a particular time.

Second, there are a number of existing studies on the source of a firm's competitive advantage undertaken with various perspectives: generic strategy, FDI, resource, global management strategy, and most of these studies were focused more on the conventional industrialization economy than on the present knowledge-based economy. However, this study reviewed the source of competitiveness with a new framework to identify how a firm develops its value-added in the knowledge-based.

Some practical implications may be derived for business managers of other firms. Korea has been achieving a remarkable economic growth to date since the 1960s by catching up the same route of developed countries' economic development. However, as the future puts the emphasis on the importance of knowledge, originality and creativeness, Korean business firms will not be able to secure competitive advantage any longer if they imitate those changes in developed countries or follow the same methods. If any firms are fully equipped for a knowledge-based society, they will be able to succeed in markets, and to utilize the opportunity of 'Winner-Take-All.' However, if these firms fall behind the competition in a knowledge-based society, then they, as late-starters, will not be sure of their survival. This study, therefore, offers working-level implications in order for business managers to realize that the source of competitive advantage is continuously changing.

2. Limitations and Future Research Directions

There have been some limitations during this study and the following topics are recommended for future research.

First, this paper began with the intention of examining the process of CI's value chain transformation, and thus, this research objective called for vast amounts of factual data for the company. However, with difficulties obtaining CI's internal data, this paper had no choice but to rely on corporate reports released to the public. More profound studies with various data sources are recommended.

Second, the shape of CI's value chain curves illustrated in figures 3, 4, and 5 may not exactly correspond with reality. This is because of difficulty in gathering data associated with CI's investment in HRM, corporate culture, and marketing activities that explain CI's transformation of the value chain to fit into the smile curve. As the main purpose of this study is to examine the changing trend of CI's value chain, from the exploratory view on the basis of secondary data, there would not be any problem presenting the general status even though the moving pattern of the graph does not exactly correspond with the actual financial performance. For these reasons, further studies adopting more precise

methodologies are recommended.

Despite the limitations mentioned, this paper provides organizational scholars with case evidence of how a Korean firm creates its competitiveness in the knowledge-based era, and the study thus motivates them to consider subsequent research in this area

REFERENCES

- Barney, J. 1991. Firm Resource and Sustained Competitive Advantage. *Journal of Management* 17(1): 99-120.
- Bartlett, C. A. and Ghoshal, S. 1998. *Managing Across Borders: The Transnational Solution*. Harvard Business School Press.
- Bryman, A. 2004. *Social Research Methods*. 2nd Ed. Oxford University Press: 201-205.
- Chang, S. J. 2003. *Financial Crisis and Transformation of Korean Business Groups: The Rise and Fall of Chaebols*. Cambridge University Press.
- Chai Industries Business Report. Various years.
- Cyert, R. M. and March, J. G. 1963. *A Behavioural Theory of the Firm*. Prentice Hall.
- DART (Data Analysis, Retrieval and Transfer System). Korea.
- Dunning, J. H. 1980. Toward an Eclectic Theory of International Production: Some Empirical Tests. *Journal of International Business Studies* 11(1): 9-31.
- Enz, C. A. 2008. Creating a Competitive Advantage by Building Resource Capability: The Case of Outback Steakhouse in Korea. *Cornell Hospitality Quarterly* 49(1): 73-78.
- Hymer, S. H. 1960. *The International Operations of National Firms: A Study of Direct Foreign Investment*. The MIT Press.
- Johnson, G., Scholes, K. and Whittington, R. 2005. *Exploring Corporate Strategy*. Prentice Hall.
- Joo, I. K., Oh, S. J., Chang, D. R., Park, Y. R., Jung, S. H., Choi, S. K. and Park, S. J. 2008. *Corporate Competitive Strategy in Global Era*. Yonsei University Press. (in Korean).
- Kefela, G. T. 2010. Knowledge-based Economy and Society has become a Vital Commodity to Countries. *International NGO Journal* 5(7): 160-166.
- Kim, Y. S., Kim, S. S. and Noh, J. B. 2009. *The Knowledge Management Model of Korean Firm*. Samsung Research Institute: 377 (in Korean).
- Kindleberger, C. P. 1969. *American Business Abroad*. Yale University Press.
- Kogut, B. 1985. Designing Global Strategies: Comparative and Competitive Value-added Chains. *Sloan Management Review* 26(4): 15-27.
- Korea Stock Exchange, 2012.
- Lee, B. G., Kang, H. C., Lee, I. W., Cho, J. H., Kim, S. T., Lee, S. K. and Jung, J. Y. 2002. *Samsung Rising*. Hankyung Economic Newspaper (in Korean).

- Maail* Economic Newspaper. 2009. *Cheil Industries Won the Presidential Prize in RFID/USN*. April 23, 2009 (in Korean).
- Mahoney, J. T. and Pandian, J. R. 1992. The Resource-based View within the Conversation of Strategic Management. *Strategic Management Journal* 13(5): 1-18.
- OECD. 1996. *The Knowledge-based Economy*. General Distribution, OECD/GD (96)102: 7.
- OECD. 2005. *OECD Science, Technology and Industry Scoreboard 2005*.
- OECD. 2007. *Moving up the Value Chain: Staying Competitive in the Global Economy*. 19.
- Penrose, E. T. 1980. *The Theory of the Growth of the Firm* 2nd Ed. Oxford: Basil Blackwell.
- Porter, M. E. 1985. *Competitive Advantage* The Free Press.
- Simon, H. A. 1976. *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization*, 3rd ed. The Free Press.
- _____. 1979. Rational Decision-making in Business Organizations. *The American Economic Review* 69(4): 493-513.
- Song, J. Y. 2011. *Smart Management*. 21st Books (in Korean).
- Toffler, A. and Toffler, H. 2006. *Revolutionary Wealth* Knopf Doubleday Publishing Group.
- Van de Ven, A. H. 1992. Suggestion for Studying Strategy Process: A Research Note. *Strategic Management Journal* 13: 169-88.
- Wells, L. T. 1983. *Third World Multinationals: The Rise of Foreign Investment from Developing Countries*. The MIT Press.