

The Rise and Fall of Eyeglass Industry and Population Decline in Fukui Region

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Keywords: Industrial Agglomeration, Regional Innovation, Diamond model, International Competitiveness, Declining birthrate and aging population, Technology transfer, Leader companies

1. INTRODUCTION

In recent times, eyeglasses have assumed a significant role not merely as vision correctives but also as elements of fashion. Serving as manifestations of personal style and accentuations of individual distinctiveness, they have acquired a pivotal presence for a multitude of individuals. The notion of fashionability exhibits substantial variation contingent upon elements such as design intricacies, frame configurations, and chromatic selections. Furthermore, an extensive array of brands and designers are engaged in the production of eyeglasses that espouse their distinctive styles and prevailing trends. The selection encompasses a diverse spectrum of frame materials, hues, dimensions, and configurations, affording the opportunity for personalized preferences in accordance with facial morphology. Moreover, the lens morphology, specialized treatments, chromatic tints, and analogous considerations also wield substantive influence over the augmentation of sartorial allure. With the increasing awareness of fashion, eyeglasses have become an indispensable item for many people, not only as a tool for correcting vision but also as a tool for self-expression and enhancing individuality.

This paper examines the eyeglass industrial agglomeration of Fukui/Sabae

which is one of the world's famous eyeglass production areas. It had been increasing demand around the world because they have the value of Made in Japan (Made in Sabae), along with regional innovation. Analyzes what is necessary to maintain the industrial agglomeration in this region where the population continues to decline. And considering whether it can be maintained by imitating the eyeglass industry agglomeration in other regions (Italy) etc. Section 2 explains the history and current status of Fukui/Sabae region's Eyeglass industry agglomeration. Section 3 uses the diamond model proposed by Michael E. Porter and summarizes information through interviews on the competitive advantage of a country for winning international competition. Section 4 analyzes the diamond model and pick them up presents the problems and challenges from it. Section 5 summarizes proposals that can contribute to the future development of eyeglass industry agglomeration.

2. The History and Present Situation of the Eyeglass Industry in the Fukui and Sabae Regions

The Fukui and Sabae region which is known as Japan's eyeglasses production area. There is an agricultural area with no special natural resources. In the past, it was a representative area without employment specially in the winter season. In the Meiji period, Formers went out to work outside of Fukui area, such as brewing sake at Nada, Hyogo Pref. and Fushimi, Kyoto Pref. area in the wintertime. However, Goemon Masunaga (later established Masunaga Optical) who had an entrepreneurship, he had started making structure for eyeglasses production that can provide work throughout the year. It is said that the reason why he chose production of eyeglasses is that he paid attention a small initial investment. It is said that the agglomeration of eyeglass manufacturing in the Fukui and Sabae regions began. Eyeglass craftsmen were invited from Osaka where eyeglasses manufacturing was thriving at the time. And the craftsmanship began to be passed on to the local people. Yohachi Yoneda, an eyeglass craftsman, was invited from Osaka to produce "brass-framed" glasses, and Kotaro Matsushima was invited as craftsman from Tokyo. He

produced “Silver Green-frame” glasses and “Red copper-frame” glasses successfully.

The production of eyeglasses requires skilled technique, such as the assembly of detailed parts. The young farmers were trained by eyeglass craftsmen invited from Osaka to Fukui. Therefore, Masunaga succeeded in increasing the number of suppliers who had completed training and get their own shops. It called “Choba system”¹². Once this system works well, each expertise, technology, and scale were able to harmonize well. And regional industrial eyeglass agglomeration emerged expanding and forming a network.

Gozaemon Masunaga who possessed an entrepreneur spirit, established “Masunaga Optical” and expanded the production of eyeglasses through the relationship between independent craftsmen. Masunaga himself may not have imagined that what he originally began as a search for a wintertime job would later develop into a center of the eyeglass industry. But he contributed to the region significant and deserves recognition.

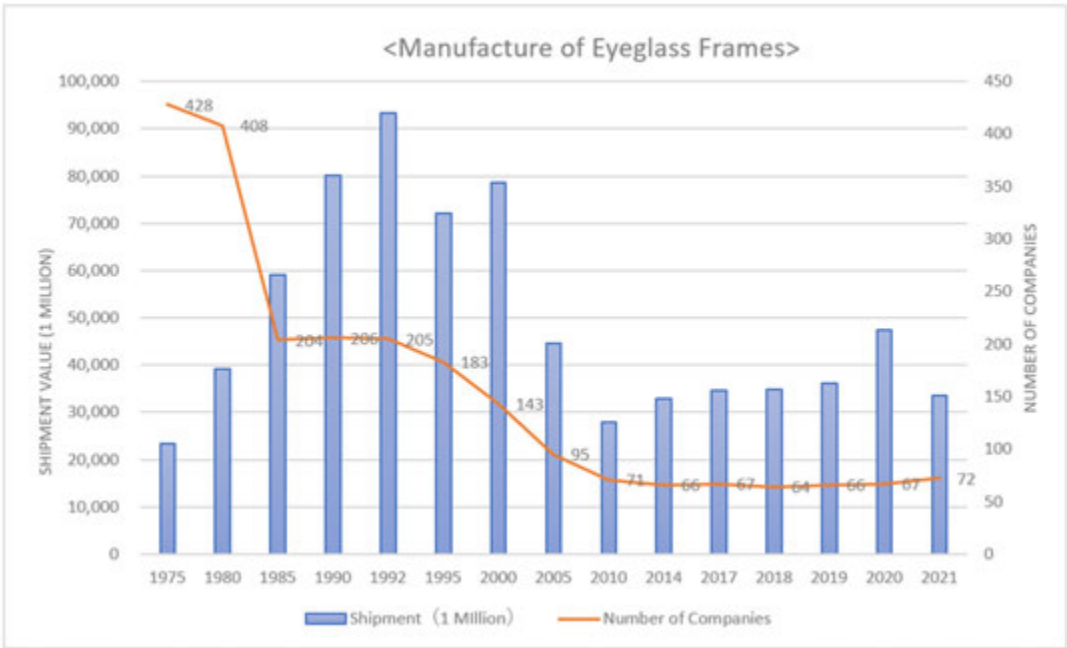
After the World War II, there was a period of rapid economic growth in Japan. At that time, fashion was less influential than it is today. And there were many demands for eyeglasses that corrected vision, durable and long-lasting. So, the company produced to meet that demand. However, after peaking in 1992, the number of businesses in the Sabae area declined significantly due to the bursting of the bubble economy in Japan and the increasing demand for inexpensive eyeglasses as made in China. As a result, increasing number of companies are going out of business without passing on their skilled techniques to the next generation. Companies established as the “Choba system” tended to experience natural attrition due to aging. And there were lot of small and micro companies that were unable to operate.

During Japan’s high-growth period, numerous products were primarily geared towards the domestic market, and their superiority in the domestic sphere persisted. However, the advent of low-priced eyeglasses from overseas diminished the competitive advantage of domestically manufactured glasses.

¹² A manufacturing system in which a craftsman group is created with the “first generation Masunaga” as the master (responsible person), and apprentices are placed under it.

As depicted in Chart 1 below, the value of frame shipments and the number of business establishments reached their peak in 1992, after which they exhibited a declining trend. Since 2017, the number of companies has stabilized at approximately 70. Despite temporary fluctuations in demand around 2019 due to the spread of the Covid-19 pandemic, overseas markets rebounded at a faster rate than Japan. Nevertheless, there has been minimal change in the number of companies, and it is evident that the volume of orders received increased by just one company.

Chart 1: Shipment Value of Eyeglass Frames and Number of Companies



Source: Excerpts from the results of the Fukui Prefectural Industrial Statistics Survey Compiled by the author

3. Diamond Model Analysis

3-1. What is the Diamond Model?

Michael E. Porter is an American business scholar and authoritative researcher in the field of competitive strategy. In 1985, in his book

“Competitive Advantage”, he proposed the Diamond Model.

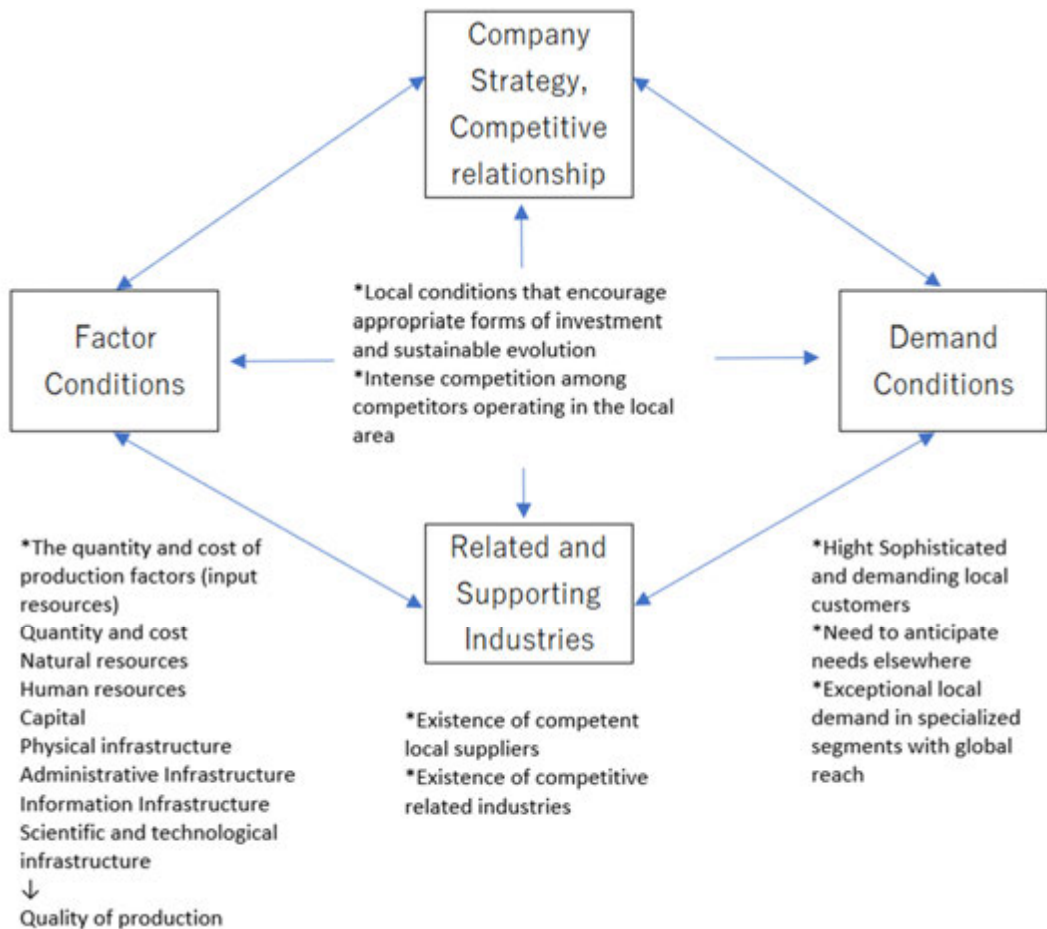


Figure 1: Diamond Model (Michael E. Porter)

Source: Competitive Strategy II Michael E. Porter

The Diamond Model constitutes a sophisticated analytical instrument employed to discern the distinctive competitive advantage of a specific country or region. It elucidates the four factors that engender competitiveness in both domestic industries and the international arena. These interconnected elements collectively shape the distinctive attributes and industrial framework of the region. The explicatory exposition of the four facets of the diamond model showcases how a country's competitive advantage is fostered through a dynamic process of innovation, continual evolution, and strategic collaboration.

(1) Factor Conditions

In order for a specific industry to flourish, it is imperative to possess suitable foundational conditions, encompassing labor, resources, technology, and infrastructure. A region's competitive advantage stems from its possession of the requisite elements, meticulously tailored to cater to the unique demands of that particular locale.

(2) Demand Conditions

The caliber and magnitude of demand exert a formative influence on the competitiveness of enterprises operating within a region. Elevated levels of domestic demand necessitate firms to uphold stringent benchmarks, culminating in the provision of competitive goods and services. This, in turn, elevates the international competitiveness of these enterprises.

(3) Related and Supporting Industries

For the progressive evolution of a specific industry, the presence of interrelated sectors, including suppliers and ancillary industries that mutually reinforce each other, assumes paramount significance. This factor constitutes a pivotal determinant in establishing international competitiveness.

(4) Company Strategy and Competitive relationship

Competition, particularly emanating from rival enterprises within the same region, constitutes a pivotal determinant in molding a company's competitiveness. Heightened competition compels companies to enhance their efficiency and explore innovative strategies to bolster their competitive edge.

Factor conditions, demand conditions, Related and supporting industries, and company strategy/competitive relationship - these four elements interplay with one another and coalesce to engender the genesis of competitive advantage on a national scale. The diamond model encompasses two prominent self-reinforcing attributes, geographic concentration and domestic competitors. In

essence, the accessibility of resources, such as a skilled workforce, reliable suppliers, and pertinent information, within a given region, constitutes a salient factor that amplifies the productivity growth of an industrial agglomeration.

But this diamond model also has some weaknesses.

* Difficulty in capturing the dynamics of competition

Though beneficial for comprehending the competitiveness of an industry or region at a specific juncture, it is essential to acknowledge that the competitive landscape and its constituent factors remain in perpetual flux. This phenomenon arises due to the influence of market dynamics and technological evolution, leading to the alteration of competitive factors over time. Consequently, conducting an analysis at a singular point in time might prove insufficient in accurately predicting future competitiveness.

* Ignoring macro-economic conditions

The primary focus lies on assessing the competitiveness of industries and enterprises within a specific country or region; however, it neglects to encompass the influence of international macroeconomic conditions. External variables, such as exchange rates, economic growth rates, and trade policies, have the potential to impact competitiveness; nonetheless, these aspects remain unaccounted for within the model.

* Lack of industrial interdependence

Porter's model accentuates intra-industry connections, yet it omits consideration of the interdependence prevailing among diverse industries. In the contemporary economy, inter-industry linkages and dependencies are on the rise, potentially influencing the determinants that mold competitiveness.

* Ignoring cultural and social factors

The Diamond Model emphasizes economic factors, yet it overlooks non-economic factors encompassing cultural, social, and other elements. These additional factors can significantly impact the competitiveness

of both companies and industries.

* Oversight of geographical factors

The model does not incorporate geographic factors, such as geographical location and climatic conditions. Nevertheless, these factors may exert a considerable influence on the competitiveness of both industries and companies.

Due to the aforementioned limitations, it is imperative to be cognizant of the constraints of the diamond model when employing it and to subject it to comprehensive analysis from a broader standpoint.

3-2. The diamond model of the eyeglasses industry agglomeration in Fukui and Sabae Regions

Derived from an autonomous examination of the eyeglasses industry agglomeration in Fukui and Sabae Regions, the author has constructed a diamond model to comprehend the prevailing state as of 2023 (Figure 2). Although the author managed to conduct interviews with related and supporting industries, interactions with companies were constrained by the author's limited position. Consequently, the analysis findings encompass both the author's discoveries and independent observations.



Figure 2: Diamond Model (Fukui/Sabae Eyeglasses Industry agglomeration)

Source: Michael E. Porter, Diamond Model, edited by the author

<Factor conditions>

The paramount determinant within Fukui and Sabae region's industrial agglomeration resides in the presence of adept artisans possessing advanced proficiencies. Despite a historical backdrop, a distinct count of proficient laborers contributes to every phase encompassed in the production of eyeglasses, a domain encompassing over 200 intricate stages. While mechanization uniformly advances across diverse industries, the realm of eyeglass fabrication diverges in this regard; mechanized advancements have not kept pace as with their counterparts in other sectors. Although the enterprise's fiscal predicaments cannot be entirely discounted, a pivotal catalyst lies in the intricately meticulous operational sequences resistant to mechanization's embrace. It is judicious to posit that this confers a competitive edge, as the complexity discourages facile emulation by foreign contenders. Nevertheless, the present juncture bears witness to an aging workforce within numerous enterprises, hampering the seamless transference of technological expertise.

Titanium¹³ and alloys is a specialty in Japan, and they have advanced technical capabilities. This is a strength for winning out in international competition, but China's technology is also improving remarkably. It is not clear whether the technology was acquired from Japanese products or from Japanese engineers, but it must be said that the technology is equivalent to that of Japanese products.

Few companies can complete the entire process on their own, and most companies perform partial processing and manufacturing. When production volume increases, delivery management is key. So, cooperation with partner companies is important.

<Demand conditions>

A distinctive feature of Fukui and Sabae region's eyeglass industry agglomeration is its OEM production of a wide range of products from low-priced to high-priced items. It does more business overseas than domestically. In other words, the past history of the company has allowed it to increase its value in the domestic market and assume a position of competitive advantage. As a result, it has been able to increase its competitiveness overseas. In fact, while the expansion of Chinese production has had an impact, the value of Japanese-made products (made in Sabae) has been recognized by many overseas customers who are particular about Japanese-made products. Although this overlaps with the Factor conditions, it can also be said that the value is recognized in work that can only be done by highly skilled craftsmen.

The Fukui-Sabae region distinguishes itself from other industrial sectors by virtue of its distinctiveness in promptly rebounding demand, consequent to the rapid resurgence of global economic vitality, alongside its elevated degree of Original Equipment Manufacturer (OEM) engagement with international clientele. Given the predominance of OEM-driven manufacturing, intrinsic challenges arise in efficaciously overseeing production volumes and intricate

¹³ Titanium is a material that is resistant to salt and does not easily cause skin rashes. It is relatively easy to use even for people with metal allergies.

workflows internally, oftentimes precipitating constrictions. Hence, for enterprises enmeshed in a diverse gamut of product categories, collaboration with cooperative suppliers emerges as the pivotal linchpin. However, it's noteworthy that these very suppliers are concurrently entrusted with orders from other corporate entities, engendering complexities in exercising command over them. As the count of eyeglass-related establishments dwindles within Sabae, Fukui, labor reservoirs have reached a state of depletion.

In recent years, the demand for products made from cellulose, a natural fiber called acetate has been increased. Acetate is easy to dye and can create vivid colors, so it is becoming more popular for eyeglasses which is a fashion item. However, while demand has increased in Europe and the United States, where the post Covid-19 recovery was quick, it has been impossible to maintain a balance between supply and demand, and it is taking a considerable amount of time before products can be shipped.

<Related and supporting industries>

One of the contributory elements fostering the agglomeration of the eyeglass industry resides in the voluminous assemblage of corporate entities within the vicinity. To buttress these companies, the Fukui Optical Industry Association encompasses the Fukui Optical Industry Association and the Fukui Optical Wholesalers Association under its organizational purview. The association diligently undertakes endeavors that bolster the eyeglass sector. Concretely, these endeavors encompass the facilitation of overseas eyeglass exhibitions¹⁴ and the dissemination of intelligence pertaining to machinery imperative for eyeglass fabrication. Furthermore, aiming to augment the augmented value of Sabae-originated eyeglass, the cooperative institution orchestrates stratagems designed to heighten recognition of the Sabae brand. Illustrative instances encompass optical boutiques, the proprietary Sabae label “THE291,”¹⁵ eyewear museums, and eyeglass festivals.

¹⁴ The Silmo exhibition will be held in Paris, France in the fall, the Mido exhibition will be held in Italy before spring, and other eyewear exhibitions will be held in Tokyo and other Asian countries.

¹⁵ The production area unified brand is a collection of original and house brands of each company in

There is also a movement toward industry-academia collaboration. We have been collaborating with Kanazawa College of Art ¹⁶ on design development for more than 20 years. And hold a design contest as an event. Among universities in Fukui Prefecture, the Fukui University of Technology ¹⁷ has a study group that is interested in the design of eyeglasses. In addition, we are collaborating with an optician vocational school in the Chubu region. Students are often interested in fashion rather than eyewear knowledge, and it can be imagined that there will be a gap between what they want to do and what they want to do in the eyewear industry agglomeration of Fukui and Sabae where there are many OEMs. However, there are companies that manufacture and operate their own brands without relying solely on OEMs. As a company whose strength lies in its design, it is benefiting from the efforts being made through industry-academia collaboration.

Although not directly related to the eyeglass industry, the Fukui Living Working Support Center¹⁸, under the jurisdiction of the Fukui Prefecture Department of Industry and Labor, has an office with the function of mediating I/U turns as a countermeasure for the declining population and aging society with fewer children. The main function of the center is to introduce jobs to people who are returning to Fukui or coming to Fukui.

Another strength is that although the number of companies is decreasing, the speed with which information is collected and communicated is a major advantage because companies in the same industry are concentrated in the same region.

<Company strategy and Competitive relationship>

Fukui. Only products that have passed the screening process to be certified as "THE291" under the strict rules as a production area can call themselves a unified production area brand.

¹⁶ An art university located in Kanazawa City, Ishikawa Prefecture. There are multiple departments such as Japanese painting, product design, and industrial design.

¹⁷ A university located in Fukui City, Fukui Prefecture. A comprehensive university with not only an engineering department but also a management information department.

¹⁸ Located in a shopping mall in front of Fukui Station. This organization is commissioned by Fukui Prefecture. They support for I/U tune.

As noted above, the number of companies is decreasing every year. Among them, there are strong competitors. The presence of competitors in adjacent areas creates pressure on each company to innovate and improve, such as by lowering each other's costs and improving quality and service. And the competition for human resources and technical excellence, as well as business factors, make them more competitive.

However, the number of companies has decreased by half over the past 20 years, and if the current situation continues, there is a possibility that competitive advantage will not be maintained due to the lack of competitors. Since the materials (resources) needed to manufacture eyeglasses are not available in Fukui/Sabae. The company procures them from outside of Fukui/Sabae through suppliers. It is important to work closely with suppliers and subcontractors. In addition, it is important to strengthen partnerships with other companies through a system of collaboration, but this too is becoming difficult to sustain due to the decrease in the number of companies.

I believe that each company needs to formulate a growth strategy in management strategy. And a mechanism to support companies that incorporate and implement personnel training, product innovation, and investment activities are necessary. However, while we cannot rule out the influence of Covid-19, the fact, shipment volumes have not changed much since 2010. It makes difficult to conclude that each company is successfully or steadily implementing growth strategy.

4. Problems and Challenges of the Eyeglass Industry agglomeration in Sabae and Fukui Regions

There are two main problems that can be identified in the Diamond Model. The first is a delay or lack of awareness of the need for continuity of industrial agglomeration. And the second is an imbalance of cooperation between neighboring companies and supporting industries. The two problems have in common a lack of shared understanding of regional characteristics and continuity of industrial structure which are the foundation of the diamond

model for necessary to maintain a competitive edge in international competition. These two problems, continuity and imbalance in coordination, are inseparable, and I will explain for the reason.

The number of companies also declined as production peaked in the 1990s. Companies that were able to continue production after that time due to uninterrupted demand from customers. The generation that was running the company at that time is assumed to be in their 40s to 60s. The decline in demand worsened in the 2000s, and since 2010, the volume of shipments has been about one-third of the peak volume.

This was due to the rapid import of cheap goods from China. It can be said that the growth in China was not the result of the country's own technological development, but rather the transfer of technology from Japan to China. The reason for this is that while there are several eyeglass companies in Fukui and Sabae that have expanded into China. Some are still operating as factories, but some companies have withdrawn from the market due to lack of profitability. Under these circumstances, it is possible to read the fact that there are a certain number of local personnel with skills taught from Japan. And that technologies with high difficulty of imitation were handed down within China. In addition, it cannot be ruled out that the transmission of technology was interrupted in Japan during the period from entering China to withdrawing. Considering that the period around 2000s was also the ice age for employment when it was impossible to hire new personnel. It can be said that this was a time when even the personnel to carry on the traditions of the company were in short supply.

Chart 2: Changes in shipment value of eyeglass frames

(Million JPY)

Year	Shipped Amount
1975	23,320
1980	39,154
1985	59,178
1990	80,073
1992	93,327
1995	72,161
2000	78,598
2005	44,528
2010	27,980
2014	32,971
2017	34,674
2018	34,898
2019	36,146
2020	47,297
2021	33,588

Source: Excerpt from the results of the Fukui Prefectural Industrial Statistics Survey Compiled by the author

From 2010 onwards, companies that implement strategies based on their competitive advantage will contribute to the continuation of the concentration of the eyeglass industry agglomeration. One concrete measure is to train skilled workers and pass on skills, which is factor condition of the Diamond Model. Also, since mechanization is considered slow in the eyeglass industry, process innovation can reduce the number of processes and improve efficiency. Related firms in the neighborhood can increase their competitive advantage within the region by implementing their own innovations. The generation that was running the business in the early 2000s is a 50s to 70s in the 2010s, and it is thought that there has been a polarization between companies that have completed business succession and those that have not. It is true that some owners are thinking of closing the company in their own generation. There could be various reasons behind this, such as the lack of a successor, the

failure to train successor, or lack of funds to invest in new innovations. But it has not been confirmed whether the company would also like to explore collaboration or partnership with other companies at the neighborhood in the same industry.

The Fukui Optical Association is also aware of the current state of industrial agglomeration in Fukui and Sabae. The collaboration with neighboring universities and vocational schools is commendable for approaching the younger generation who are interested in eyeglasses. For example, it may be possible to build a partnership between the business community as well as activities to create a mechanism to boost the eyeglass industry together with the local community by holding eyeglass festivals. Students from the above-mentioned universities and vocational schools also participate in this glass festival¹⁹. And it is held in collaboration with industry and academia.

In the past, Sabae City has worked on projects to boost the concentration of the eyeglass industry. It was named the “Vigor Revitalization Project”, and about 10 members from different industries were put in to formulate and implement a plan from concept planning to branding of Sabae’s eyeglasses. The mayor at that time also clearly stated that “what the government can do is to get started and continue it.” Incorporating the research and trends of young people’s fashion, it is transmitted from Sabae where it is actually produced. And the mayor himself becomes the originator and participates in collaboration with the popular apparel industry in Tokyo Girls Collection. Starting with building the existence value of eyeglasses produced in Sabae, the company actively implemented activities through the media to reach younger generations other than students.

On the other hand, there is an “NPO L Community”²⁰ based in Sabae City which is conducting activities for regional revitalization. As a representative activity, NPO L Community is implementing measures to establish

¹⁹ An annual eyeglass-related festival held in the vicinity of the Megane Kaikan in Sabae City. However, due to corona infection, the festival could not be held for several years.

²⁰ A non-profit organization represented by Miki Takebe

an educational system for children related to IT such as programming. Although it is now common to have programming classes starting in elementary school, the origin of this practice is said to be a case in which Sabae City established a programming education system with a major IT company and L Community that aims to revitalize the community. This NPO already has a case where a child who learned programming as students. They grew up and now teaches programming and contributes to the community. Author feels the need for the companies that make up the eyeglass industry agglomeration to grow by adopting innovations that can create such a human resources cycle.

The reason for the decline in the number of companies in the Fukui-Sabae region is the declining birthrate and aging population, which is a problem throughout Japan. Low fertility and an aging population are the result of a declining birth rate and an increasing proportion of elderly people in the demographic structure of a region or country. This is characterized by a decrease in the number of children due to declining fertility rates and a concomitant increase in the proportion of elderly people. The main factors are as follows.

- Declining fertility rate : Due to modernization and economic growth, educational standards are improving and women are becoming more active in society, and there is a growing tendency to postpone marriage and childbirth. Another factor is that couples are less willing to have children due to economic reasons and lifestyle changes.
- Lengthening of life : Advances in medical technology and improvements in living conditions have increased the average life expectancy of the elderly. This has resulted in an increase in the proportion of the elderly population, while at the same time decreasing their participation in the labor force and economic activities.

Chart 3: Population trends by age group in Fukui Prefecture, Fukui City, and Sabae City

	2007		2022		推移			
	Fukui Prf.	Fukui+Sabae City	Fukui Prf.	Fukui+Sabae City	Fukui Prf.	Ratio	Fukui+Sabae City	Ratio
under 9	76,209	32,259	57,106	25,742	(19,103)	-25.1%	(6,517)	-20.2%
10 to19	85,725	33,752	70,634	31,206	(15,091)	-17.6%	(2,546)	-7.5%
20 to 21	81,072	35,844	61,926	28,401	(19,146)	-23.6%	(7,443)	-20.8%
30 to 29	108,139	47,475	75,031	34,230	(33,108)	-30.6%	(13,245)	-27.9%
40 to 49	99,230	40,895	98,165	43,994	(1,065)	-1.1%	3,099	7.6%
50 to 59	120,645	48,409	99,103	43,423	(21,542)	-17.9%	(4,986)	-10.3%
60 to 69	97,423	40,478	96,305	38,965	(1,118)	-1.1%	(1,513)	-3.7%
70 to 79	88,489	33,865	103,084	42,693	14,595	16.5%	8,828	26.1%
80 to 89	47,520	17,539	61,181	25,143	13,661	28.7%	7,604	43.4%
over 90	10,258	4,161	19,790	7,625	9,532	92.9%	3,464	83.2%
unknown age	1,488	1,202	10,651	5,357	9,163	615.8%	4,155	345.7%
Total	816,198	335,879	752,976	326,779	(63,222)	-7.7%	(9,100)	-2.7%

Source: Excerpt from Fukui Prefectural Control Survey Results Aggregated by the author

As the birthrate declines and the population ages, various social and economic challenges may arise. Labor shortages which could result in a future supply of labor that is in short supply because of fewer children. This will be an important factor affecting economic growth and social welfare systems. Next is the burden of social security with the increasing burden on the social security system including pensions, medical care, and nursing care, as the number of elderly people increases. It contributes to the economic burden and sustainability issues of the system. Finally, the exodus of young people to cities and the increase in the number of elderly people could lead to the decline of local communities in rural areas. This could hamper regional revitalization.

Important measures to deal with the declining birthrate and aging population include support measures to improve the birth rate, measures to promote the social participation of the elderly, and work style reforms to secure a labor force. It is necessary to promote comprehensive measures in local communities and the whole country.

To Summarize the above issues and challenges,

<Issue>

- Delayed or weak recognition of the continuity of industrial agglomeration
- Imbalanced of cooperation between neighboring companies and supporting

industries

<Challenge>

- Lack of measures to counter the decline in the number of skilled workers due to the aging of skilled workers and delays in training
- Slow progress of process innovation
- Inconsistency between movements of supporting industries and movements of each company (lack of coordination)
- Although a bridge between the government and the eyeglass industry has been established, the linkage is weak (not sustainable).
- The number of workers is decreasing due to the falling birthrate and the aging of society.

From those, I conclude that the eyeglasses industry agglomeration is declining.

5. Analysis and proposals for the continuation of the eyeglasses industry agglomeration in Fukui and Sabae Regions

Before analyzing the continuation of the eyeglass industry agglomeration in Fukui and Sabae Regions, a comparison will be made with the Belluno region, the largest eyeglass industry agglomeration in Italy.

There are many studies comparing the agglomeration of the eyeglass industry in Japan and Italy. Among them, Koyama (2022) ²¹ explains the difference in strategy between Charmant in Japan and Luxottica in Italy which are the top manufacturers in both regions. The article examines the Japanese company Charmant and the Italian company Luxottica, which took the opportunity of the cheap Chinese offensive in the 2000s to adopt a different strategy, based on the “Path dependence, Path destruction, and Path creation” theory.

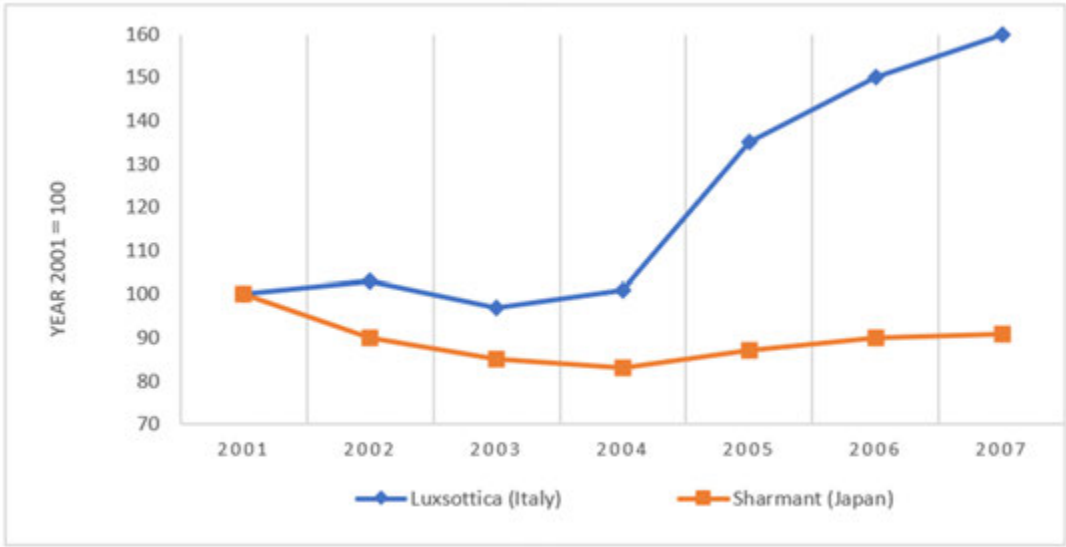
Charmant in Japan established a wholesale company in Japan and overseas to

²¹ “Fundamental Issues of Japanese SMEs in Industrial Agglomeration - Suggestions from the Italian Mountains - Partial excerpt from Toshiyuki Koyama (2022) ”

develop business with eyeglass chains and control manufacturing and sale in-house instead of relying on existing wholesalers. This is defined as the destruction of path dependence and the new market development pathway as path creation. However, it faced a slowdown in growth due to the entry of low-priced products and the termination of licensed production. The company fell behind in the development of overseas markets which was factor in its remaining a local representative.

On the other hand, Luxottica in Italy which had existed through licensing agreements for brand-name glasses. Became a global champion with a luxury brand under its umbrella when it entered the US Market. Not only maintaining the existing manufacturing and sales system, but also breaking down and creating new routes to develop new markets and through the integration, they were able to develop a series of global markets. It can be said that this was an innovation that made eyeglasses into fashionable.

Chart 4: Changes in sales of the largest companies in both regions



Source: Excerpt from Comparative Study of Industrial Clusters in Japan and Italy, Toyama (2009), edited by the author

Chart 5: Business structure of eyeglass-related companies in the Sabae and Belluno regions

	Company in Sabae	OEM	Original	Licensed	Company in Belluno	OEM	Original	Licensed
Middle sized company	Company A	50%	40%	10%	Company J	0%	100%	0%
	Company B	70%	25%	5%	Company K	65%	35%	0%
	Company C	5%	20%	30%				
Small sized company	Company D	99%	1%	0%	Company L	0%	100%	0%
	Company E	100%	0%	0%	Company M	0%	100%	0%
	Company F	100%	0%	0%	Company N	0%	100%	0%
	Company G	100%	0%	0%				
General trade company	Company H	85%	15%	0%	Company O	0%	100%	0%
	Company I	50%	50%	0%	Company P	0%	0%	100%

(Note) Ratio by sales amount. Not included Brand licence in EU and US region.

Source: Excerpt from Comparative Study of Industrial Clusters in Japan and Italy, Toyama (2009), edited by the author

The eyeglass industry agglomeration in the Belluno region of Italy originated from the emergence of specialized subcontractors and the formation of a foundation for the division of labor and mutual complementation between companies specializing in specific processes. Production processes were decentralized and companies specializing in a process formed a network among themselves. Small and medium-sized craftsmen and subcontractors maintained complementary relationships with large companies, and production know-how spread and permeated within the production area. Small and micro companies focused on manufacturing while large companies developed relationships with the market ²².

The Fukui and Sabae region's eyeglass industry agglomeration and the Belluno region's eyeglass industry agglomeration have different historical backgrounds, but they have something in common in terms of the division of labor. However, the different strategies taken in each region have greatly affected the continuation of industrial agglomerations. In both regions, titanium eyeglass frames and distribution control are the production of new products and the development of new markets, respectively. However, another

²² Excerpt from Lessons learned from Belluno, Italy's eyeglass production area (Hiromi Oki 2015)

fashion itemization achieved by Belluno region in Italy is different from the innovation of the Fukui and Sabae regions. This innovation is a change of practice trajectory, a discontinuous innovation as defined by Schumpeter, an Austrian-born economist, and we believe that this innovation is what made the decisive difference in the subsequent development of the two production areas.

We wonder if there is continuity in the eyeglass industry agglomeration in the Fukui-Sabae Regions by conducting fashion innovation in the same way as in the Belluno area in Italy, I think that is not the case. The reason is that it is not possible to respond to the changes of the times only by imitation. A symbolic of the changing times is the development of eyeglass industry agglomeration in China. In China, not only the price but also the quality, the glasses are becoming comparable to those made in Sabae, Fukui. Based on the analysis of the current problems and issues in the previous chapter, this section discusses the sustainability of the eyeglass industry agglomeration. Using the Diamond model, I have summarized the complementary points that need to be addressed in order for the region to become an industrial agglomeration. Explain what should be complemented for each of the four elements. In addition to the four elements, I added the presence of leading companies. This assumes not only one company but multiple companies.

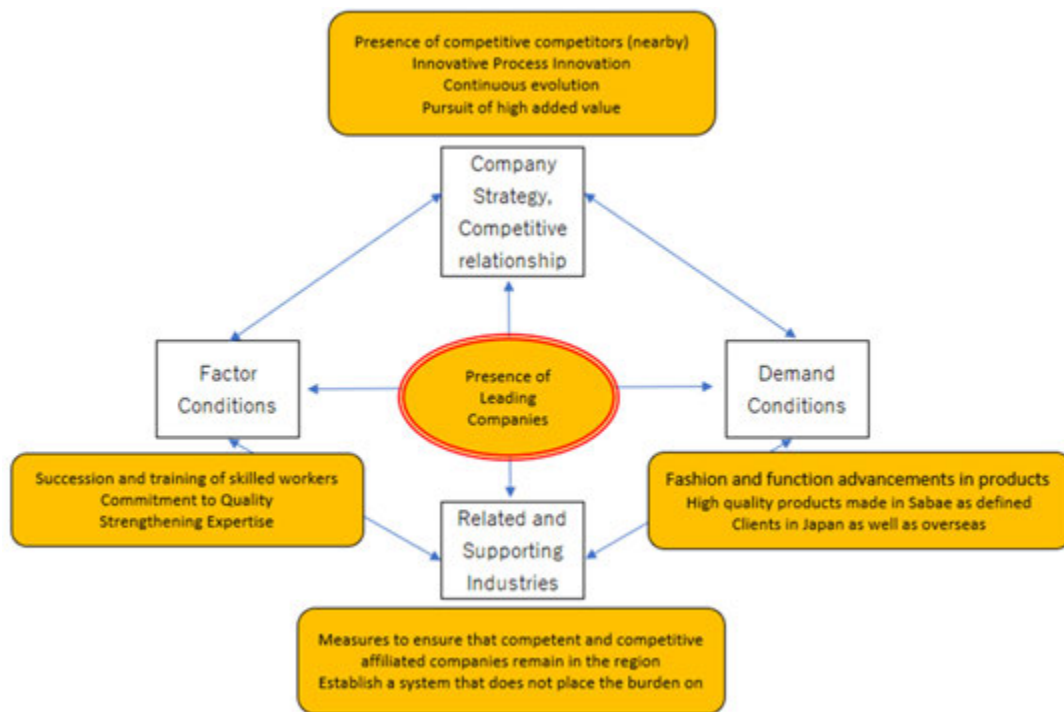


Figure 3: Points to be complemented by the diamond model

Source: Michael E. Porter, Diamond Model, edited by the author

<Factor conditions>

We believe that it is an urgent task to pass on and train skilled workers who are the source of our competitive advantage and technological strength. Due to the declining birthrate and aging population, the aging of employees has become an issue at the workplace of each company. The number of skilled workers in the “Hiring ice age” generation (40–50 years old) is very small. By promoting the transfer of technology to this generation or younger, this will lead to the continuation of technology succession in the future.

<Demand conditions>

Fukui and Sabae Region’s eyeglass industry agglomeration is based on OEM production, but we believe that it has the potential to develop into product innovation through customers by working on the development of fashion and functions. In addition, the high quality of eyeglasses made in Fukui and Sabae

Regions is already recognized not only in Japan but also overseas. But we can also provide the defined high quality by made in Fukui and Sabae. For example, the towel industry agglomeration in Imabari, Ehime pref. has established a manual for towel quality standards and certifies towels after confirming that they meet the standards. Under this system, certified companies can call themselves “Imabari Towel”. As a side note, the Fukui Glasses Industry Association has also implemented similar efforts in the past, and a group of Imabari towel industry visited the Fukui Glasses Association in Sabae. Then they studied the efforts of the Optical Association and brought it back. Subsequently, the company institutionalized an evaluation system that it still uses today. The number of processes involved in eyeglass production and towel production are completely different, so whether or not it is possible to institutionalize them, it is important to recognize the reality that Imabari Towel was faster in promoting innovation.

<Related and supporting industries>

This element is related to all other elements, and I feel the need to make measures for securing human resources and building a corporate structure. It goes without saying that experienced management is necessary for formulating corporate strategy, but at the same time, it is necessary to carry out a development process that encourages management participation from mid-level management. However, it is assumed that there are many companies that have not been able to implement this plan due to a lack of middle-class personnel. If this happens, it will shift to the younger generation with less experience, but it can be considered that the burden on the younger generation will only increase, and it may have a negative impact on job satisfaction.

Although the declining birthrate and aging population are factors, there have been cases of U-turns who have moved from Fukui Prefecture to urban city. The generations returning are mostly those in their 30s and 50s. There are various reasons, but there are two main patterns. those who are around 30s, they want their children to be educated in Fukui which has a lot of nature rather than raising children in the Big city. And those who are around 50

years old who feel the need to take care of their parents after they have finished raising their children. However, the reality is that many families give up on moving due to the difference in salary levels between the big city and regional cities.

Since there are organizations that support the employment of U-turns and I-turns workers in various age groups, I believe that the entire eyeglass industry-related companies can contribute to securing human resources by collaborating with each other rather than with individual companies.

<Company Strategy and Competitive relationship>

As mentioned earlier, the number of companies is on a downward trend due to an increase in the number of companies that are experiencing difficulties in continuing their operations, including business succession issues. Following the current trends, it is likely that consolidation will accelerate in the future as well as closure of businesses. In the diamond model, it is proposed that the presence of competitive competitors can increase competitiveness by allowing them to compete with each other on cost and technology, consolidation may allow one company to complete the entire eyeglass production process. However, this may not be enough to maintain its function as an industrial agglomeration. Companies that are able to integrate should not only have their own growth strategies, but also form production networks and maintain complementary relationships with supplier and subcontractors. This seems to be the same as the current industrial agglomeration, but the big difference is that large companies that can be integrated become the leading companies in the industrial agglomeration area.

Below is definition of a leading company.

- Innovation and progressiveness

Focus on bringing innovative ideas and technologies to the market and industry, and develop new approaches and products.

- Customer orientation

Focus on understanding customer needs and providing products and services

to meet them. Build loyalty and differentiate themselves from competitors.

- Emphasis on human resources

Focuses on acquiring and developing human resources. Emphasis is placed on bringing people with excellent leadership skills into the organization and enabling them to reach their full potential.

- High organizational ability

Strong organizational skills with efficient processes and flexibility to adapt quickly to change.

- Social responsibility

Adopt a business strategy that considers social impact, focusing on sustainability and social contribution rather than just pursuing profit.

The important point is the creation of a system that not only implements the company's own growth strategy, but also collaborates with competitors and can complement operations with neighboring small and medium-sized companies, and the need for a company that can ensure social responsibility by demonstrating strong leadership that can maintain industrial agglomeration. While I do not deny the need for competition among competitors, I believe that institutionalizing a system of cooperation and information sharing with suppliers that exist in neighboring regions can be a strength of industrial agglomeration. So that they can recognize and cooperate with each other. Although the diagrammatic representation of the line structure is more complex than the diamond model. It shows that the leading firms are involved with respect to all four elements. Each of the leading companies are strong competitor which is also a factor that makes industrial agglomeration stronger.

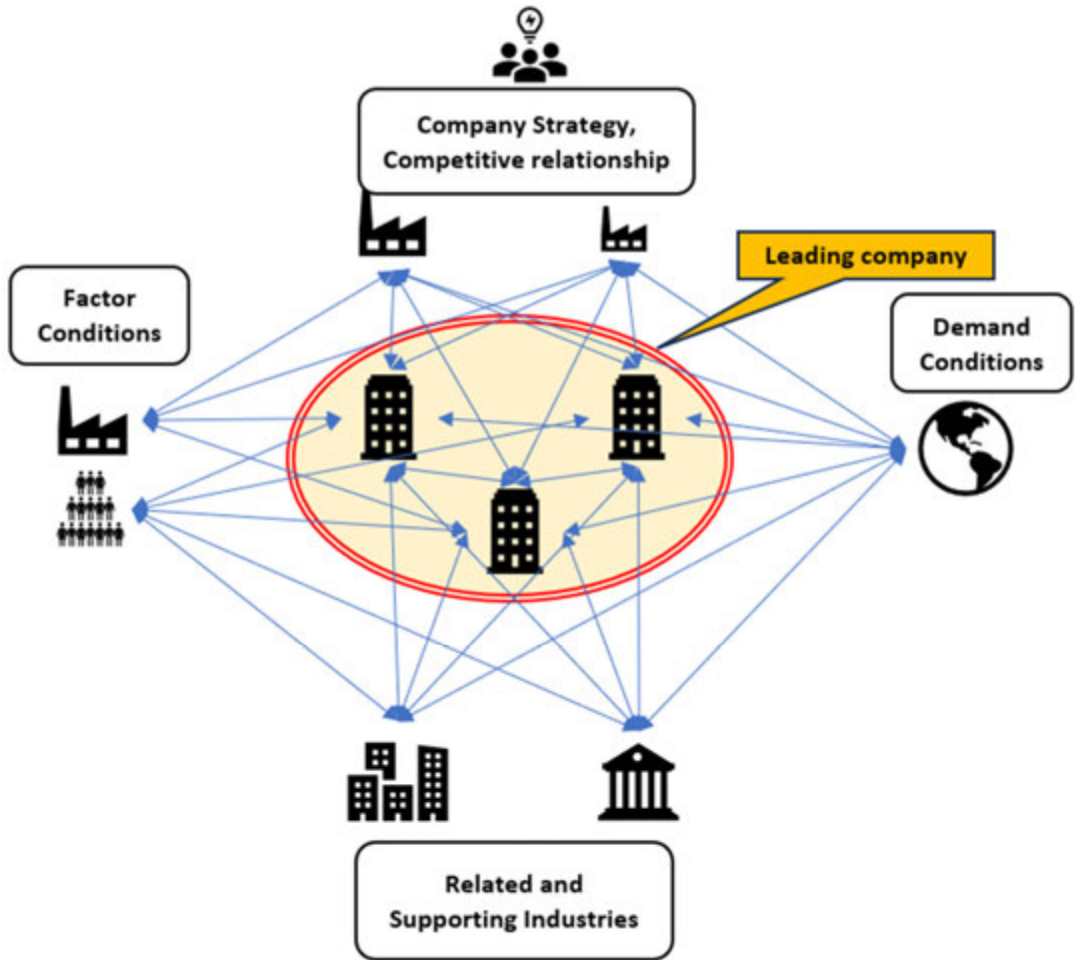


Figure 4: Correlation chart of Leading companies

Source: Created by the author

6. Summary

As described above, I have identified the problems and issues that need to be addressed in order for the eyeglass industry agglomeration in Fukui and Sabae Regions, to continue to thrive and have proposed a new concept of “Leading Company” based on the diamond model and regional innovations.

Due to the historical background, the nature of industrial agglomeration changes over the times. I believe that it is necessary to develop and implement measures to ensure the continuation of industrial agglomeration, not by asking

support industry and governments to develop strategies to maintain complementary relationships with small and medium-sized companies that compete on cost and quality and divide labor among competitors in neighboring areas which is a characteristic of industrial agglomeration as well as each company, but rather by taking measures to ensure that leading companies which are more likely to take leadership and can continue to operate in the industrial agglomeration.

On the other hand, although Fukui and Sabae Regions are eyeglass industrial agglomeration with OEM productions. There are also companies that design, manufacture and sell their own products. One company that comes to mind is “Kaneko Optical.”

In 2006, we established a manufacturing division with the aim of “Inheritance and development of manufacturing culture” of Sabae, with the aim of becoming a creator himself. The company has three factories in Sabae City, and while the division of labor by specialized factories is common in the production area, the company has established an integrated in-house production system by manufacturing almost all processes in-house with determination and conviction. In the future, we aim to further globalize our operations and establish a supply chain management system from production to sales, which is pioneering in the eyewear industry.

Source: Quoted from the Kaneko Optical website

Although Kaneko Optical is based in Sabae which is an industrial agglomeration, it has not only established an integrated design and production system but has also realized an integrated system from manufacturing to sales, including marketing strategies. From an academic point of view, this can be said to be a management innovation that incorporated all the elements of innovation.

In the quotation from the Kaneko Optical website, there is the word “Determination and conviction”. Behind these words is the resolve to become independent from collaboration and complementary connections as an eyeglass

company located in an industrial agglomeration and the belief in formulating a strategy to build an integrated production system in-house in anticipation of the decline of the eyeglass industry agglomeration. Although it is only within the scope of the author's idea, it can be highly evaluated that he has carried out management innovation using his own design.

Due to the author's position, it was not possible to conduct interviews with companies in this survey, so issues remain regarding the fact that the author was not able to ascertain the full reality in the area of corporate strategy and competitive relations factors. In addition, from the perspective of regional innovation, it remains to be seen how interviews with a larger number of active organizations could have introduced more examples of regional revitalization.

The challenges to the continuation of the eyeglass industry agglomeration in Fukui and Sabae area in the future, include the succession of skills (training of skilled workers), the presence of competitors in the neighborhood (many companies) and the establishment of leading companies. The author is also involved in the eyeglass industry, I would like to continue our case studies and contribute to the continuation of the eyeglass industry agglomeration in Fukui and Sabae.

[Acknowledgments]

I would like to express my gratitude to Associate Professor Hiroyuki Hashimoto of the Graduate School of Social Sciences, University of Hyogo, for his enthusiastic suggestions and guidance during the writing of this article. In addition, Shimamura-san, secretary general of the Fukui Optical Association, Takebe-san, representative of the NPO L Community, Miyakoshi-san, general manager of the Fukui Living Support Center, and Fukui Industry Labor Department Labor Policy Division Industrial Human Resource Office Manager Endo-san spared her precious time and received a great deal of cooperation. Thank you from the bottom of my heart.

I would also like to thank my family for their constant support and everyone in the Regional Innovation Course, Department of Business Administration,

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