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# Beyond Marshallian Agglomeration Economies: The Roles of the Local Trade Association in a Meiji Japan Weaving District (1868–1912)

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## Abstract

Recent studies have shown that economic development based on industrial districts or clusters is common not only in the Western nations but also among many developing countries, as Marshall might have anticipated. Similarly, in the development process of modern Japan, many industrial districts developed in various industries. Interestingly, they were much more organized and institutionalized than Marshall described. This article demonstrates that local trade associations had an important role in enhancing Marshallian externalities by facilitating joint actions for the supply of public goods, such as the creation of “local district brands” and provision of technological and market information. In this article, we consider the case of Kiryu, which was one of the oldest and best-known silk weaving districts in modern Japan.

Keywords: industrial district, industrial cluster, weaving industry, local trade association, joint action, modern Japan

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## 1. Introduction

Many studies have attempted to explore why small enterprises under decentralized production systems have not only survived but also prospered in many industrial districts. As is well known, Alfred Marshall identifies three advantages of industrial districts, which consist of small enterprises in a small region: information spillover, specialization and division of labor among enterprises, and the development of a skilled labor market.<sup>1</sup> According to Tetsushi Sonobe and Keijiro Otsuka, these agglomeration economies are present in contemporary developing economies.<sup>2</sup> However, there seems to be no guarantee that such advantages, called agglomeration economies, were generated spontaneously and maintained automatically. Indeed, historical research in Europe focuses on the role of diverse production organizations in supporting the industrial districts.<sup>3</sup> As Francesca Carnevali points out, the trust and cooperation needed for market transactions are maintained by trade associations.<sup>4</sup> In Japan, local producers in industrial districts have made many efforts to internalize Marshallian externalities through local trade associations [*dogyo kumiai*]. Such efforts have been conducive to sustaining the competitive advantages of industrial districts in this country.<sup>5</sup>

It is interesting to note that this concept of internalizing externalities is closely related to what Hubert Schmitz calls “collective efficiency.” This state arises from “external economies” and “joint action,” with Schmitz regarding the former as related to “passive” and the latter as related to “active” collective efficiency.<sup>6</sup> Schmitz refers to the local trade association as one of the central institutions that facilitates joint action, as verified by the findings of many studies in contemporary developing economies.<sup>7</sup> In Emilia-Romagna, as Sebastiano Brusco describes, the establishment of associations made it possible

for small entrepreneurs to overcome their lack of knowledge about commerce and their weak bargaining power in obtaining raw materials and credit. More important, associations covering entire regions also established technical consultancy offices, consortia for marketing, and co-operatives, all of which provide guarantees for bank loans at the lowest possible rate of interest.<sup>8</sup>

In this article, we aim to show that the activities of local trade associations enhanced and supported Marshallian agglomeration economies for the sustainable growth of industrial districts in Meiji Japan (1868–1912).<sup>9</sup> We examine the important functions of the local trade associations in the weaving districts, which are beyond the scope of Marshallian agglomeration economies. In short, joint action helped in supplying public goods; that is, local trade associations functioned not only as providers of technical and market information but also as quality control institutions in order to build the reputation of the local brand name. The development process of Kiryu, which was one of the most advanced silk weaving districts in modern Japan, serves as the best example to demonstrate joint action since Kiryu achieved sustained growth with a wide lineup of products for the domestic market and became a pioneer in exporting *Habutae*, or plain silk fabric. The district's success required continuous improvement of production methods and products while simultaneously creating and maintaining its reputation as a high-quality producer.<sup>10</sup> Without establishing a local trade association, Kiryu could not have maintained its position as the most popular silk weaving district in Japan. More interestingly, while Kiryu's growth was based on developing a putting-out system with a large number of small enterprises, local producers also jointly established large factories, with some financial support from the central government, in order to benefit from economies of scale in the throwing, dyeing, and finishing processes.

The operation of this industry serves as an example of the joint action that Marshall envisaged as necessary for realizing the division of labor.

In the second section of this article, we provide an overview of the silk weaving industry development in Meiji Japan and explain how important it is to explore the case of Kiryu. We will also review increases in the number of local trade associations and in the development of a supporting legal system. At the same time, we investigate how the government of Gunma prefecture, where Kiryu is located, developed a legal system to support the local trade association. The third section explores to what extent the trade association maintained and enhanced the conventional Marshallian agglomeration economies and the extent to which the joint establishment of large firms contributed to the development of flexible specialization while enabling scale economies. The fourth section examines how actively local public goods were supplied by the association. The final section provides conclusions and implications drawn from comparative historical views.

## 2. The Development of Silk Weaving Industry in Meiji Japan

### 2.1. An overview

Table 1 shows the changes in the real value of production in major silk weaving prefectures in 1895, 1900, 1905, and 1910. Although fluctuating, production values increased in many prefectures. In addition, particularly rapid growth occurred in the prefectures that produced *Habutae* for export.<sup>11</sup> In 1895, the production values were noticeably high in Kyoto (Nishijin-district), Gunma (Kiryu and Isesaki-districts), and Fukui. While Kyoto and Gunma were traditional weaving districts, Fukui was newly developing. Fukui's production

grew rapidly, and at the turn of the century, Fukui's ranking became 2<sup>nd</sup>, exceeding that of Kyoto in 1905.

< Table 1 here>

Silk weaving districts can be roughly divided into two groups, as shown in Figure 1: domestic-market-oriented districts and export-oriented districts. Districts like Tsuruoka, Kawamata, and Fukui, which appear as striped circles on the map, were typical *Habutae* export-oriented, newly growing districts. Other districts produced mainly *kimono* or *obi-sash* for domestic markets. Distinctly rapid growth occurred in the export-oriented districts (see the growth rate shown in the last column of Table 1). More interesting, these two groups maintained quite different organizations of production within the district. Domestic-market-oriented silk weaving districts are more directly relevant to Marshallian agglomeration economies since they need more complicated processes for production, based on division of labor, than export-oriented districts do. The variety of products in the domestic market-oriented districts was generally far wider than that of *Habutae* export-oriented districts, in which semi-finished material for piece dyeing was produced. In other words, producers in these districts tried to facilitate the division of labor in various ways within the district.

<Figure 1 here>

Kiryu was one of the best-known districts whose production was intended for domestic market. Figure 2 shows Kiryu's long-term trend in the value of

production since 1878. From the end of the 1870s to the middle of the 1880s, its value of production sharply declined. This is partly because of economic recession and partly because of the inferior quality problem that will be discussed later. After the late 1880s, the district experienced rapid recovery and growth until the end of the 1890s. We hypothesize that we can link the trends shown in Figure 2 with changes in the structure of production and institutions in the Kiryu district: establishment of a local trade association and development of the division of labor, such as a putting-out system.<sup>12</sup>

<Figure 2 here>

A historical review of the Tokugawa Period (1603–1867) will help in understanding not only the whole process of the development of the silk weaving industry in Japan but also local producers' movements to reorganize the institutional structure of the weaving district after the Meiji Restoration. At the beginning of the Tokugawa Period, silk fabrics were exclusively luxurious because only a few privileged people were allowed to wear them—for example, emperors, samurai, court nobles, and Buddhist priests. Thus, Nishijin in Kyoto had been the most important silk weaving district since the end of the medieval period because Kyoto had been the center of politics, religion, and culture, surrounded by the most advanced commercial and industrial areas in Japan. In fact, after the center of politics was moved to Edo (now Tokyo) in the early 17<sup>th</sup> century, the privilege of importing raw silk from China was granted only for producers in Nishijin because their customers were noble people.

With the economic development in the middle of the Tokugawa Period, wealthy merchants and rich people began to wear silk fabrics. Hence, silk

weaving districts prospered in the countryside, especially in eastern Japan—that is, Kiryu, Ashikaga, Yonezawa, and Hachioji, as shown in Table 1. Kiryu had a long history of silk weaving from ancient times, but it rapidly grew after the technology of yarn-dyed fabrics and looms was transferred from Nishijin in the mid-17<sup>th</sup> century.<sup>13</sup> As a result, fabric markets developed not only in western but also in eastern Japan. After the opening of the ports in the mid-19<sup>th</sup> century and as soon as the silk products began to be imported from the West, the Japanese people became absolutely fascinated with their vivid colors, designs, and textures. Many weaving districts—especially those close to Edo, which was one of the large markets, and to Yokohama, a major port—tried to launch substitutions for imports by using imported dyestuffs, imitating their designs, and introducing thin, machine-made cotton yarns as weft. Above all, Edo became a mature market and the center of fashion as weaving districts developed in nearby areas—namely Kiryu, Ashikaga, and Hachioji.<sup>14</sup>

After the Meiji Restoration in 1868, further major changes came to the industry. Traditional guilds were dissolved due to a new policy advocating freedom of trade; and, as a result, the number of new entrants increased in the industry. Thus, an increasingly large quantity of products of unknown quality rapidly flooded the market. This development caused market disorder so that production declined in the early 1880s (see Figure 2). Producers and traders in the traditional industrial districts were trying to organize institutions to substitute for the traditional guilds in order to regain their reputations.<sup>15</sup> In the next section, we will again discuss their trial-and-error process of building local trade associations as new organizations to provide solutions for the above problems.

In spite of the confusion and disorder in the market, the weaving industry became increasingly more prosperous with the introduction of Western



technologies. The use of jacquard manufacturing mechanisms with the addition of machines for the finishing process—for example, calendars—significantly improved design, textures, and luster. The introduction of synthetic dyestuffs not only reduced cost but also made it possible to produce yarns and fabrics with more vivid colors. Since synthetic dyestuffs were originally used for Western textiles, the application of this new technology to traditional products resulted in a deterioration in the quality of products in the weaving industry, even though the original intention was to manufacture products that could compete with Western products in the domestic market. Even so, the new technology gradually made Japanese products more fashionable. Consequently, for many weaving districts, design and fashion were the most important factors for competition with other districts.<sup>16</sup> Thus, how to assimilate new foreign technology and improve the products became crucial for every district.

After international trade was liberalized in the mid-19<sup>th</sup> century, export markets were also opened to silk fabrics. Japan's silk export, including both raw silk and silk fabrics, grew rapidly. Kiryu, which had been engaged in producing traditional goods for the domestic market, became the first exporter of *Habutae* silk fabric since 1877, which was a new product. In the 1880s, the principal silk product for export shifted very quickly from handkerchiefs to *Habutae*. As shown in Table 1, *Habutae* export grew rapidly with the launching of production in Fukui, a newly leading district of *Habutae* export.

## 2.2. Establishment of the legal system for a local trade association

Due to the freedom of trade that led to the demise of the Japanese guild [*kabu nakama*] after the Meiji Restoration, new entrants in many industries caused rapid increases in production and distribution, especially in traditional

ones that used simple technologies. Tetsuji Okazaki defines *kabu nakama* as “a group composed of members who have *kabu*,”<sup>17</sup> or a business license granted by the public authorities. Therefore, the demise of *kabu nakama* encouraged new entrants to engage in merciless competition by new entrants under the freedom of trade principle. However, extreme confusion, fraud, and cheating in trade also followed, thereby resulting in an inferior quality problem. Such undesirable tendencies appeared in both domestic and export markets. As a result, many districts gained a bad reputation.

To solve this problem, local trade associations were organized, not as a revival of *kabu nakama* but as the new center of joint action for the survival of industrial districts. Prior to developing legal systems for local trade associations, local producers voluntarily established such collective organizations in their industrial districts in order to compete with other districts, to establish efficient production organization by small producers, to restore their reputations, and to build successful local brands. However, this approach proved unsustainable because they had no legal basis for imposing sanctions.<sup>18</sup> In the case of the weaving industry, the spread of inferior-quality fabrics became a nationwide problem.<sup>19</sup>

The Ministry of Agriculture and Commerce, which regarded the principle of freedom of trade as important, maintained a cautious stance regarding the revival of *kabu nakama*. Producers and merchants, however, had a strong desire to reestablish collective organizations, and the Meiji government wished to promote export industries. Therefore, the Ministry of Agriculture and Commerce enacted the Rules of Trade Association [*Dogyo Kumiai Junsoku*] in 1884. Although this rule was not compulsory, it was important for local trade associations established by merchants and producers to fall in the jurisdiction of

the Ministry of Agriculture and Commerce. Since the Ministry of Agriculture and Commerce did not know the details of problems that each trade association faced, it introduced the permission system in 1891, in which prefectural governments prepared the plans for the regulatory rules of local trade associations that produced important commodities and submitted them to the Ministry for approval. Consequently, by 1896, the Ministry had approved the rules for 78 local trade associations in 18 traditional industries.<sup>20</sup> Such cases increased to about 700 in 1909 and to 1029 in 1915, of which the weaving trade associations numbered 134.<sup>21</sup> In 1900, the Law of Local Trade Associations Producing Important Commodities [*Juyo Bussan Dogyo Kumiai Ho*] was enacted. This law was important because all the producers and merchants in the same district had to be members under this law.

Let us review the impacts of the legal system by examining the case in Kiryu as an example.<sup>22</sup> After the Meiji Restoration, new entrants produced inferior quality goods by using newly imported dyestuffs. This resulted in the destruction of reputation, not only for new entrants but also for the whole Kiryu district. In 1875, weavers in Kiryu, who were feeling the crisis, in vain requested the local government to make regulatory rules. A retail shop of silk products in Tokyo put up a big sign over its door: “We do not deal in the products of Kiryu.” Driven by a shared sense of crisis, 171 local producers and traders in Kiryu established the Kiryu Company [*Kiryu Gaisha*<sup>23</sup>] in 1878 for collective quality control, which was one origin of the local trade association in Kiryu. They started making serious efforts to recover their reputation in the market by creating quality certification labels. Such private initiatives in Kiryu were known to be quite active. Similar companies were established in other silk weaving districts not voluntarily, unlike Kiryu, but based on suggestions by local

governors.

In 1882, the Kiryu Company changed its name to the Kiryu Commodity Company [*Kiryu Bussan Gaisha*] and expanded its membership. Some members, however, refused intervention from this collective organization, arguing that such an organization violated the principle of freedom of trade. Finally, the Kiryu Commodity Company collapsed in 1890 due to conflicts of interests among its members. Thus, Kiryu district again faced a critical situation regarding the quality control of its products. In 1892, local producers organized the Kiryu Commerce and Industry Association [*Kiryu Shokogyo Kumiai*] under the Rules for Trade Associations by the Ministry of Agriculture and Commerce (enacted in 1884) and set up rules for inspecting products in both export and domestic markets in order to eliminate low-quality products and to recover their reputation. Furthermore, in 1894, the Gunma prefectural government enacted the Rule of the Local Trade Association for Weaving in Gunma Prefecture [*Gunmaken Orimono Dogyo Kumiai Kisoku*], which required producers in diverse activities in the district to become compulsory members.<sup>24</sup> Thus, merchants dealing with raw materials, like dyestuffs and yarns; producers engaged in a preparation process; and reed producers, who had not been members previously, became the association's members. In 1898, the Kiryu Trade Association for Commodities [*Kiryu Bussan Dogyo Kumiai*] was subject to the Local Trade Association Law for Important Export Goods, which was enacted by the Ministry of Agriculture and Commerce in 1897. Weaving-related producers who engaged in scouring, rolling, and dyeing were also required to become members. In 1905, the Kiryu Trade Association for Commodities was reorganized into the Kiryu Trade Association for Weaving [*Kiryu Orimono Dogyo Kumiai*: KTAW henceforth] under the Law of Local Trade Associations Producing

Important Commodities. Changing the name from “Commodity” to “Weaving” was an advertizing strategy because the former did not signify the activities of the association.<sup>25</sup> The articles of partnership in the association were also changed, excluding dyers, dyestuff merchants, and cotton yarn merchants from the membership, none of whom were directly related to silk production. In other words, this change encouraged limited membership within a district and strengthened the leading role of weaving producers or merchant manufacturers in the association. In all likelihood, such a development of legal systems by central and local governments strengthened the function of local trade associations. In the next section, we will explore how division of labor in Kiryu was facilitated by the trade associations.

### 3. Development of the Division of Labor in Kiryu

In this section, we will focus on the specialization and division of labor among enterprises that constituted the three sources of Marshallian agglomeration economies because this topic is highly relevant to the roles of local trade associations. It must be also pointed out that the extent of the development of a skilled labor market and the number of information spillovers are not measurable. In fact, the development of a putting-out system with an increasing number of out-weavers brought about increases in the value of production in the late 19<sup>th</sup> century, as shown in Figure 2. Specialization also advanced, especially in dyeing, twisting, and finishing processes, which are subject to economies of scale.

#### 3.1. Putting-out system development in Kiryu

In the putting-out system of the weaving process in Kiryu, weaving producers or manufacturers put out yarns as raw materials to out-weavers, who usually worked in their homes in rural villages. The producers usually pre-dyed the distributed yarns and completed other preparation processes, such as warping and winding. Weaving producers or manufacturers visited out-weavers to distribute yarns, to pick up fabrics later, and to pay them a processing fee. Originally, the wives and daughters of farmers became out-weavers primarily in a slack agricultural season. The prefectural government made good reports on the development of the putting-out system after the 1880s. However, unfortunately, no statistical data are available until the turn of the century. According to the data surveyed from the prefectural government, the number of weaving manufacturers was 724 in 1901 and 468 in 1904, and the number of out-weavers was 3796 and 2751, respectively.<sup>26</sup> The average number of out-weavers per putter for four years was 5.5. However, as shown in Figure 3, its increasing trend is apparent toward the early 1910s.

There is an interesting survey by Nishijin producers on other weaving districts including Kiryu, titled “Weavings in Eastern Japan” (1914). The aim of this survey is clearly identified: “to determine why new weaving districts such as Kiryu, Ashikaga, Isesaki, and Hachioji experienced rapid growth.”<sup>27</sup> Nishijin was proud of its position—namely, as the leading, the most traditional, and the best-quality silk weaving district in Japan. However, Nishijin producers were feeling considerable pressure from the growth of “the developing districts.” According to this survey, collective cohesion was particularly strong in the eastern weaving districts, and the number of full-time out-weavers who had sufficient skills was increasing in Kiryu because putters increasingly focused on high-quality products. In the early 1910s, the number of out-weavers per putter

was at least between 20 and 30, which was much higher than the number in Nishijin, and it climbed to 400 to 500 during the peak season.<sup>28</sup> These numbers are much larger than the prefectural government reported, presumably because the Nishijin producers visited large putters. Statistical data from the local government shows an increasing trend in the number of out-weavers until the mid-1910s.<sup>29</sup> As shown in Figure 2, it is likely that the development of the putting-out system brought about increasing production.

The conventional historical consensus has been that the putting-out system as a way of organizing production was destined for demise and that the factory system would take its place. When the number of factories increased from the late 1910s, accompanying the introduction of power-loom, out-weavers dropped dramatically in the 1920s in Kiryu.<sup>30</sup> However, recent studies argue that this development relates not to the transition from one organization to the other but, rather, to the choice between organizations.<sup>31</sup> It is true that, when the production of high-quality figured fabrics was dominant in Kiryu, weaving producers chose manufacture or factory production. However, their choice was not because a centralized production system could realize higher productivity, but because the producers were trying to prevent imitation of their important designs by out-weavers. Therefore, they relied on out-weavers only for producing ordinary fabrics without special designs and color combinations. In fact, weaving producers in Kiryu used the putting-out system when the market demand for relatively simple products increased in the 1880s.<sup>32</sup>

<Figure 3 here>

### 3.2. Specialization and sub-contracting in Kiryu

Within the Kiryu district, not only the putting-out system for the weaving process but also the specialization of other processes developed. According to the articles of partnership for the Kiryu Trade Association for Weaving (1905), the association membership was diverse, including weaving producers,<sup>33</sup> fabric merchants, scouring producers, silk-yarn merchants, dyers, dyestuff merchants, and cotton-yarn merchants. Besides the above members, there were a lot of miscellaneous producers and traders in Kiryu, who specialized in particular processes that were needed for producing silk fabrics. Figure 4 shows the activities of weaving producers (merchant-manufacturers) (left) and the specialized processes carried out by subcontractors (right) in Kiryu around 1910. Many processes were carried out by specialized subcontractors, in which weaving producers had an organizational role. Weaving producers had originally engaged in the whole production process, from preparation to weaving, except for finishing. However, as is shown by the double-headed arrows in the figure, many processes became outsourced, such as throwing, dyeing, design, weaving, and finishing. Earlier, weaving producers had carried out the dyeing process as one of the preparation processes until synthetic dyestuffs, which needed scientific knowledge, were introduced. Responding to a significant increase in the number of dyers, the prefectural government included the dyeing industry in its annual statistical survey after 1915.<sup>34</sup>

<Figure 4 here>

The statistical data collected by KTAW show how dense the agglomeration was in Kiryu.<sup>35</sup> In 1900, there were 853 weaving producers, 37



fabric merchants, 16 scouring and finishing producers, 62 raw silk merchants, 18 dyers, 14 dyestuff merchants, 6 cotton-yarn merchants, 12 designers for jacquard machines, 25 reed producers, 115 warping [*hata-goshirae*] producers, and 6725 out-weavers.<sup>36</sup> It is clear from these data that many of the processes formerly carried out by weaving producers, such as design, dyeing, and warping, had shifted to outsourcing.

### 3.3 Development of specialization by joint facilities

It is important to note that specialization, as described above, further developed through the establishment of large-scale joint facilities. This is consistent with the theory of the division of labor by George Stigler, who argues that as the size of the market expands, the specialization of firms in specific processes increases.<sup>37</sup> The joint facilities were established with support from the central government, but critically important also was the enthusiasm and commitment from the leading members of KTAW.<sup>38</sup> Previously, each weaving producer had individually outsourced many processes, as is shown in Figure 4. However, the large-scale operation of throwing, dyeing, and finishing processes, when carried out with advanced machineries, became more efficient and could enjoy scale economies.<sup>39</sup> The purchase of such machineries, however, required investment funds that individual producers could not afford to finance. By jointly establishing new facilities, small weaving producers gained flexible specialization. Let us examine the case of two large-scale firms in Kiryu closely.

In 1902, the central government implemented a policy to promote and develop the silk weaving industry by leasing advanced machines. In order to qualify for leasing a machine from the government, local producers and merchants had to establish a joint-stock company in the district. Therefore,

leading members of KTAW discussed and attempted to establish a joint-stock company [*Kiryu Nenshi Gaisha*] with modern throwing machines in 1902—namely, the Kiryu Throwing Company. Kiryu became one of the six selected districts for this policy, and the company was then the largest throwing company in Japan. In this company, there were 10 throwing machines made in France and leased by the Ministry of Agriculture and Commerce, and 12 other advanced machines owned by the company. In 1906, there were 12 male workers and 126 female workers in the company with 2 steam engines (40 HP). It grew rapidly, employing as many as 19 male workers and 180 female workers, and was equipped with 3 steam engines (110 HP) in 1910.<sup>40</sup> The product—that is, thrown silk yarn—was sold not only within Kiryu district but also in other districts. In 1910, this company became the first exporter of thrown silk yarn in Japan.<sup>41</sup>

Ryomo Preparation and Finishing Co. Ltd [*Ryomo Seishoku Kabushiki Gaisha*], established in 1907, was also important for the development of specialization in Kiryu. Establishment of this company was also supported by the industrial promotion policy of the central government to improve the finishing process for export fabrics. In those days, many defects in exported fabrics were reported by the Japanese consular in the West. One of the causes for serious defects was an inappropriate finishing process.<sup>42</sup> To recover the reputation of its exports, the central government decided to support the establishment of a finishing company either in Kiryu or in neighboring Ashikaga (a silk and cotton weaving district). The average share of export of silk fabric in Kiryu climbed to around 30% in 1900.<sup>43</sup> There were, however, only a few factories equipped with Western-style finishing in Kiryu, so producers and merchants felt that they needed more. Therefore, the leaders of KTAW launched

a big campaign to build the needed company in Kiryu. Fortunately, Kiryu was chosen and Ryomo Preparation and Finishing Co., Ltd., was established, with 14 advanced finishing machines leased from the Ministry of Agriculture and Commerce, and began operations in 1908. In the beginning, it engaged in dyeing and finishing for export fabrics and later started production of silk fabrics. Though there were only 60 male workers and 30 female workers with one steam engine (28 HP) in 1908, it grew rapidly and employed 112 male workers and 114 female workers in 1910.<sup>44</sup> In this company, various processes were mechanized, including dyeing, scouring, calendaring, and lustering.

In sum, both companies discussed above were much different from other preparation or finishing factories regarding technology and scale. For example, in 1904, there were only four factories (more than 10 workers) for preparation or finishing in Kiryu, all of them smaller than these two.<sup>45</sup> However, the number of finishing, dyeing, and scouring companies that were members of KTAW grew rapidly after the establishment of these two companies: there were 18 in 1906, 24 in 1910, and 83 in 1920.<sup>46</sup> It is likely that former workers from these large companies quit their jobs to become independent as owners of small companies. While the central government partially supported the establishment of these factories, it is clear that private initiatives by KTAW and the development of organized specialization by weaving producers played an important role in promoting such factories.

#### 4. Local Trade Association as a Supplier of Public Goods

According to a study by Takanori Matsumoto, which summarizes the common features of local trade associations in modern Japan, the associations

had six functions: product inspection, marketing research, public awareness, advertisement, infrastructure building, and joint projects.<sup>47</sup> While the functions of local trade associations were varied, it is clear that these functions were closely related to the supply of public goods. In the case of Kiryu, we should note that the local trade association had a role in introducing new technology and knowledge from the West, such as synthetic dyestuffs, and in creating and maintaining Kiryu-brand by quality control. Obviously, the association performed many tasks, such as collecting samples of foreign products for members, carrying out statistical surveys in the district, sending members abroad for field research, promoting market expansion, protecting property rights for design, and encouraging out-weavers and workers by means of incentives.<sup>48</sup> In what follows, we explore joint action by local trade associations in depth.

#### 4.1. Introduction of new technology from the West

In the early Meiji Period, Kiryu was well known as the advanced district in which local producers aggressively introduced new Western machines—for example, Western looms, such as the flying shuttle, jacquard, and finishing roll machines. This district played an important role in diffusing new technologies and knowledge to other districts in Japan. In other words, it was a conduit of new technologies and knowledge from the Western countries.<sup>49</sup> Synthetic dyestuff was one of the new technologies that required a knowledge of chemistry. As Tomoko Hashino points out, while many weaving districts aggressively introduced synthetic dyestuffs in the early Meiji Period, inferior quality in fabrics, caused by inappropriate ways of dyeing, became a nationwide problem. One of the reasons was lack of scientific knowledge of dyeing methods.<sup>50</sup>

Though some producers tried to learn chemical dyeing methods

individually, they generally failed to master it. This problem was so serious in Kiryu that, in 1876, the prefectural government sent a lecturer on chemical dyeing methods to Kiryu for seventy or eighty local producers.<sup>51</sup> Kiryu Company, formerly KTAW, sent several young students to a prefectural medical school to study chemistry in 1878. After graduation in 1880, they started diffusing improved dyeing methods for using synthetic dyestuffs. However, an institute of dyeing built by Kiryu Commerce and Industry Association succeeded in widely promoting diffusion of better chemical dyeing methods in the Kiryu district. The Kiryu Institute of Dyeing invited Mr. Jiro Yamaoka, an engineering official in the Ministry of Agriculture and Commerce who had once learned chemistry in the West, to teach at the institute. From 1884 to 1886, Yamaoka taught improved practices as well as the theory of chemical dyeing to local producers in Kiryu. In 1896, this institute became Kiryu Town's Textile School [*Choritsu Kiryu Orimono Gakko*]. It is obvious that the local trade association was a conduit for new technology and knowledge, which was critically important for the supply of local public goods.<sup>52</sup>

#### 4.2. Creating Kiryu-Brand by collective quality control

Carrying out collective quality control and introducing new technology and knowledge were important functions of the local trade association as a supplier of public goods. In general, local trade associations organized by producers made strict rules for production quality throughout Japan. For examples, with regard to fabrics and papers, local trade associations set rules for dimensions (width, length, and weight) and for materials used in their products. In order to maintain a standard quality for products, they also had to set rules for methods of inspection and grades quality certification.<sup>53</sup> As explained earlier,

when the Kiryu Trade Association for Commodities was reorganized into KTAW, it amended the articles of partnership, clearly defining the rights and obligations of members, inspection methods, and quality standards for the members. Referring to the above articles of KTAW, we would like to show how inspections were carried out to keep a high quality of products and to obtain trust for their quality certification labels from the market.<sup>54</sup>

KTAW set rules for issuing six types of quality certificate labels according to products: that is, fabrics for the export market, silk fabrics for the domestic market, mixed (silk and cotton) woven fabrics for the domestic market, cotton fabrics for the domestic market, woolen fabrics and linen fabrics, and thrown silk for materials. Different colors of labels indicated the grades. For example, in fabrics for export market, five grades carried gold, silver, red, green, or purple labels. Labels for silk and cotton fabrics for domestic market had three grades, and inspectors seem to have been more careful when inspecting export products than those for domestic markets.<sup>55</sup> As shown in Figure 4, all fabrics were subject to inspection before fabric merchants could buy them. A quality certificate label was attached to the inspected fabric, which weaving producers needed when they sold their fabrics to merchants. Besides, weaving producers had to place their own stamps on the certificate label. Another article states that KTAW required producers and merchants to be honest about their materials and production methods in order to maintain trust for Kiryu-brand in the market. Producers had to note the raw materials, weight, and dimensions of the fabric on their products with precision. False declarations concerning the above items and the trading of defective goods, even due to negligence, were strictly prohibited.

The rules were both explicit and detailed regarding the required

inspection methods for both fabrics and thrown silk as material. The checklist for fabrics included the following six items: (i) producer's stamp or dealer's name, (ii) width, length, and weight, (iii) no false declarations of raw materials, (iv) no cheating, such as using minerals for fabrics, (v) weft yarns with uniform quality, and (vi) appropriate quality certificate label with producer's stamp. A similar checklist existed for thrown silk as materials.

Until the Ministry of Commerce and Industry started inspection of fabrics for the export market in 1928,<sup>56</sup> KTAW played a critical role in the quality control of products for the export market. Before inspection, fabrics for the export market required scouring, and the members of KTAW had to carry out the finishing process. If inspectors determined that the fabric needed to be scoured again, producers could not refuse to do so. KTAW even had a right to cut merchandise for inspection. For the sale of export goods, producers needed not only a quality certificate label but also an inspection certificate with a stamp from the inspection clerk who worked for KTAW. In the case of fabrics for the domestic market, the inspection clerk set the seal on the quality certificate label. In sum, it is clear that inspectors carried out their work more carefully on fabrics for the export market than on those for the domestic market.

Even as members' fabrics underwent a strict inspection, the Kiryu Trade Association of Weaving had clear strategies for exploring new businesses. The association followed two strategies for expanding the market during the Meiji Period.<sup>57</sup> The first was to display fabrics in many exhibitions. KTAW joined 54 temporary exhibitions, including international and domestic expositions, competitive exhibitions, and shows at a famous hotel in Tokyo from 1893 to 1914.<sup>58</sup> They not only used temporary exhibitions but also set up a permanent showroom in the KTAW building. The purpose of this permanent showroom was

to display the many kinds of fabrics made in Kiryu, namely samples of Kiryu-brand. In addition, the association collected samples there from other weaving districts in Japan and abroad for producers' convenience. Since KTAW protected one-year property rights for good designs or color combinations, which was valuable for improving the Kiryu-brand, it must have encouraged product innovations.

The second strategy included releasing a few publications—a monthly magazine from 1894 to 1910 and a small booklet for introducing Kiryu-brand in 1903 and 1908—along with displaying some sophisticated fabrics at a terminal station in Tokyo for advertising the Kiryu-brand. Even though the monthly magazines were not published every year, they offered members valuable information on domestic and export markets, market conditions in Kiryu, and the out-weavers' reputations for the purpose of multiple punishment.<sup>59</sup> As a main advertiser, KTAW supported the monthly magazine *Kakiage Times*, published by the Kakiage Company [*Kakiage Shoten*], one of the leading fabric merchants in Kiryu.<sup>60</sup> With this magazine, the company aimed to advertise Kiryu-brand to the market, improve the quality of products, and introduce new knowledge and technologies for entrepreneurs and merchants in Kiryu.

In sum, KTAW's quality control measures contributed to creating and promoting the Kiryu-brand. The KTAW-issued quality certificate labels were the source of the market's trust in the Kiryu-brand. Issuance of the quality certificate, which obliged honest declaration of quality by producers, must have reduced information asymmetry. We can find some similarities between the case of Kiryu, explored here and in the well-organized employers' trade association in the Lyon silk industry, which was established in the 1860s and which Pierre Vernus fully examines. According to Vernus' research, trade associations in the



Lyon silk industry offered not only commercial information to members for reducing information asymmetries, but also provided legal and fiscal advice. Besides, trade associations contributed to the collective promotion of Lyon silk wares by implementing quality control, regulating putting-out relations, and developing crapes manufacturing.<sup>61</sup> As a provider of public goods, both associations contributed to the development of industrial districts.<sup>62</sup>

## 5. Conclusion

In this article, we have focused on the role of trade associations, which maintained and enhanced Marshallian agglomeration economies by facilitating the division and specialization of labor and organizing collective action. We demonstrated that the growth in the real value of production in the Kiryu silk weaving district after the mid-Meiji Period occurred because the enterprises developed division of labor, particularly in the putting-out system and also through specialization of other processes. The weaving producers themselves outsourced and organized various processes, such as scouring, dyeing, throwing yarns, weaving, and finishing ones. Initiatives of KTAW, as well as financial support from the central government, also promoted specialization by joint facilities—that is, large two companies that enjoyed scale economies. While the functions of KTAW were diverse, we can interpret it as the supplier of public goods. Collective quality control by strict rules enabled the association to create and sustain the Kiryu-brand, and advertisement activities also contributed to market expansion in various ways. With great effort, the Kiryu Trade Association also introduced new production knowledge and technology. The diffusion of appropriate dyeing methods throughout the whole district, using

synthetic dyestuff, was critical for improving the quality of fabrics in Kiryu. Finally, the Kiryu Trade Association created a mechanism for information dissemination regarding production knowledge and technology

The historical experience in Kiryu has a broader implication for stagnating industrial districts in contemporary developing economies that fail to introduce new production knowledge from abroad, as Tetsushi Sonobe and Keijiro Otsuka have explained.<sup>63</sup> As we have shown, it was difficult for individual entrepreneurs—for example, producers and merchants—to acquire advanced knowledge, especially from developed countries. The awareness of such knowledge as public goods made entrepreneurs in industrial districts act together. To be successful, entrepreneurs should not concentrate on narrow interests or private advantage alone but should make an effort to build mutually beneficial collective organizations. Of course, the history of local trade associations is replete with conflicts of interests and trial-and-error processes, including the development of the legal system. However, it is critically important for the development of industrial districts/clusters that the industry create a collective mechanism, such as a local trade association, that provides new knowledge, keeps quality of products, and promotes local brand name, which are all relevant public goods. Viewed from a historical perspective, stagnant individual districts/clusters in developing countries will not be able to grow, unless they organize effective collective actions for the benefit of the industry as a whole.

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<sup>1</sup> Marshall, *Principles of Economics*.

<sup>2</sup> Sonobe and Otsuka, *An East Asian Model, A Comparative Study of Asia and Africa*.

<sup>3</sup> Sabel and Zeitlen, *World of Possibilities*.

<sup>4</sup> Carnevali, “Crooks, Thieves, and Receivers.”

<sup>5</sup> Hashino, *Keizai Hhatten*.

<sup>6</sup> Schmitz, “Collective Efficiency,” 536.

<sup>7</sup> Nadvi, “The Cutting Edge”; Schmitz, “Small Shoemakers.”

<sup>8</sup> Brusco, “The Emilian Model,” 173.

<sup>9</sup> Jonathan Zeitlin appropriately points out that a more important question for researchers on industrial districts concerns their reproduction and sustainability. Zeitlin, “Industrial

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Districts,” 225.

<sup>10</sup> Hashino, *Keizai Hatten*, 170. For a brief history of Kiryu, see Hashino, “The Rise of the Power-loom Factory,” in *Production Organization*, ed. Okazaki, 14–38. The rapid growth of *Habutae* export is described in Hashino, “The Importance of Consular Reports,” 486–501.

<sup>11</sup> *Habutae* is a kind of silk fabric needed for the export market; it is very light, plain, even, and uniform. For *Habutae* export and related issues, see Hashino, “The Importance of Consular.”

<sup>12</sup> At the turn of the century, Kiryu’s production declined again and then showed an increasing trend after 1904. We believe that such changes can be attributed to a temporary slump due to the economy-wide crisis around 1900.

<sup>13</sup> Kiryu orimonoshi hensankai, *Kiryu Orimonoshi 1*, 242.

<sup>14</sup> Tamura, *Fasshon no Shakaikeizaishi*.

<sup>15</sup> Suzuki et al., *MBA*, 67.

<sup>16</sup> Hashino, “Historical Process.”

<sup>17</sup> Okazaki, “Merchant Coalition,” 188.

<sup>18</sup> Suzuki et al., *MBA*, 67; Abe and Nakamura, “Nihon,” 20–21.

<sup>19</sup> Hashino, “Historical Process,” 9.

<sup>20</sup> Suzuki et al., *MBA*, 67–68. For further information on the development process of legal systems for local trade associations, see Abe, “The Development.”

<sup>21</sup> Suzuki et al., *MBA*, 68.

<sup>22</sup> Gunmaken, *Orimono*, 9–13, 79. Their detailed activities will be explained in the 4<sup>th</sup> section.

<sup>23</sup> The first law to regulate the use of the word *company* in general was enacted in 1893. Before its enactment, a wide variety of “new” types of economic entities used the word *company*.

<sup>24</sup> In 1891, the Minister of Agriculture and Commerce informed the governors that they could



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enact rules for local trade associations, if needed, to protect and promote the development of industry and commerce in the prefecture. In that case, governors were allowed to enact the rules instead of adhering to the *Dogyo Kumiai Junsoku* [Rules for Trade Association] that the Ministry of Agriculture and Commerce had enacted in 1884.

<sup>25</sup> Kiryu orimonoshi hensankai, *Kiryu Orimonoshi* 3, 58.

<sup>26</sup> Gunmaken, *Orimono*, 94, 96.

<sup>27</sup> Nishijin shinkokai, *Kanto*, 1.

<sup>28</sup> Nishijin shinkokai, *Kanto*, 5.

<sup>29</sup> Hashino, *Keizai Hatten*, 20.

<sup>30</sup> Hashino, *Keizai Hatten*, 20.

<sup>31</sup> Hashino, *Keizai Hatten*, chapter 1. The literature survey by Okazaki and Nakabayashi is valuable for understanding how researchers challenged the “mode of production” for the last four decades, was according to a traditional view of Karl Marx. See Okazaki and Nakabayashi, “History of Production Organizations,” 4–6. In the case of the embroidery industry in the eastern part of Switzerland, decline in embroidery machine prices at the end of the 19th century brought about an “inverse” transition from a factory system to the putting-out system based on out-workers in the villages. See Kurosawa, *Kindai suisu keizei no keisei*, 330–332.

<sup>32</sup> Gunmaken, *Gunmaken Orimono*, 60–61.

<sup>33</sup> “Weaving producers” means independent weavers, including putters. Out-weavers were excluded from membership in KTAW.

<sup>34</sup> Suzuki et al., *MBA*, 57.

<sup>35</sup> Gunmaken, *Orimono*, 95–96.

<sup>36</sup> In this survey, the number of out-weavers is quite different from the figure in *Statistics of Gunma Prefecture* (1901).

<sup>37</sup> Stigler, “The Division of Labor.”

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- <sup>38</sup> Nishijin Shinkokai, *Kanto*, 18–19.
- <sup>39</sup> Nishijin Shinkokai, *Kanto*, 18–19.
- <sup>40</sup> *Statistical Survey of Gunma Prefecture* in 1906, 144; in 1910, 163.
- <sup>41</sup> Kiryu orimonoshi hesankai, *Kiryu Orimonoshi* 3, 254.
- <sup>42</sup> For information on the problem and the response by the prefectural government, see Hashino, “The Importance of Consular Report.”
- <sup>43</sup> Hashino, “From Putting-out to Factory System,” Figure 2–11.
- <sup>44</sup> *Statistical Survey in Gunma Prefecture* in 1908, 142; in 1910, 162.
- <sup>45</sup> *Statistical Survey in Gunma Prefecture* in 1904, 213. According to this survey, the four factories are as follows; throwing factory (14 workers), dyeing-scouring factory (22 workers), finishing factory (10 workers), and scouring-finishing factory (27).
- <sup>46</sup> Kiryu Orimonoshi Hensankai, *Kiryu Orimonoshi* 3, 130.
- <sup>47</sup> Matsumoto, “Ryotaisenki Nihon.”
- <sup>48</sup> Kiryu Orimonoshi Hensanka, *Kiryu Orimonoshi* 3, 60–61.
- <sup>49</sup> Hashino, *Keizai Hatten*, 170.
- <sup>50</sup> Hashino, *Keizai Hatten*, 10.
- <sup>51</sup> Gunmaken, *Kiryu Orimono*, 35.
- <sup>52</sup> In the 1880s, local trade associations established 10 institutes of dyeing. Many of them became prefectural textile and dyeing schools when the Ministry of Education developed the law of the educational system in the 1890s. (Hashino, “The importance of consular”).
- <sup>53</sup> Yasuoka, “Meijiki dogyokumiai,” 70–71.
- <sup>54</sup> Kiryu Orimonoshi Hensankai, *Kiryu Oriomonoshi* 3, 58–90.
- <sup>55</sup> Inspections for fabrics for the export market became stricter in 1907 because inspection methods were neither appropriate nor sufficient. Kiryu Orimonoshi Hensankai, *Kiryu Orimonoshi* 3, 427.
- <sup>56</sup> The Ministry of Agriculture and Commerce was divided into the Ministry of Commerce

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and Industry, and the Ministry of Agriculture and Forestry in 1925.

<sup>57</sup> Kiryu Orimonoshi Hensankai, *Kiryu orimonoshi* 3, 187–210.

<sup>58</sup> Kiryu Orimonoshi Hensankai, *Kiryu orimonoshi* 3, 537–540.

<sup>59</sup> Nakabayashi, “Flexibility and diversity,” 151–159.

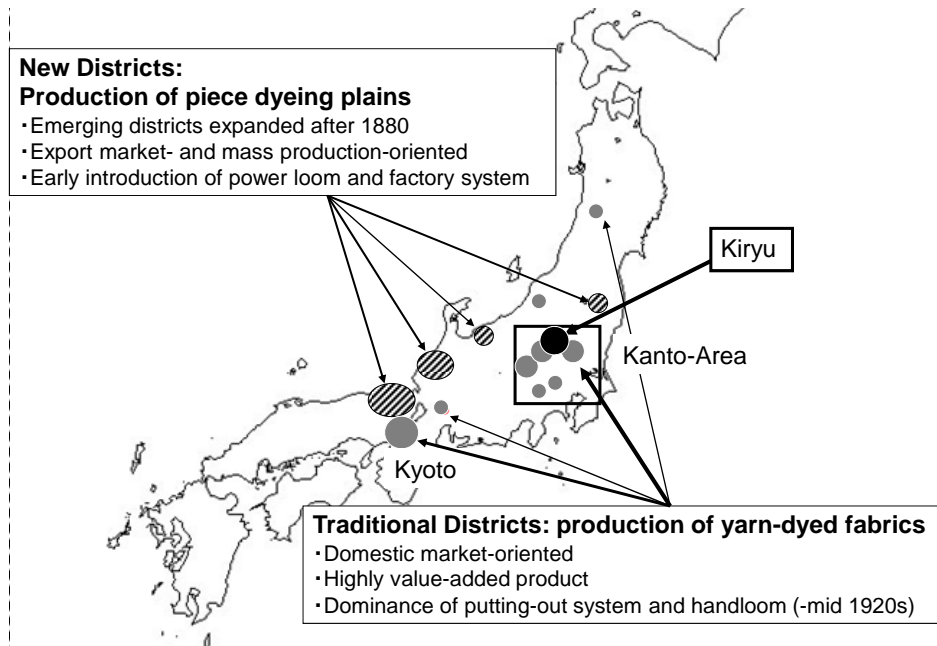
<sup>60</sup> It is known that the Kakiage Company also held the central position in the local financial system, by issuing promissory notes, which weaving producers used widely as a means of payment to raw silk merchants. Those bills were discounted by local banks. See Ishii, “Kigyo kinyu no keisei,” 274. The relationship between the local production system and the regionally organized banking system requires further research from the view of industrial clustering.

<sup>61</sup> Vernus, “Regulating the activity.”

<sup>62</sup> Local trade associations have not always contributed to the development of industrial districts. In fact, Benedita Camera shows a typical example in the case of the embroidery industry in Madeira where their production, based on the putting-out system, was mainly for the US market, and manufacturers-exporters established a compulsory ‘guild’ in 1935. Contrary to expectations, the state-backed guild promoted the collective regional brand by prohibiting imitation rather than promoting innovation. Camera, “The Institutional Control of Innovation.” Steven Tolliday and Yasushi Yonemitsu also investigate a similar case in the Arita pottery district in Japan, in which the Marshallian industrial atmosphere was not dominant. Rather, a pragmatic atmosphere was so dominant in Arita that encompassing collective institutions have not been nurtured. See Tolliday and Yonemitsu, “Microfirms and Industrial Districts,” 65.

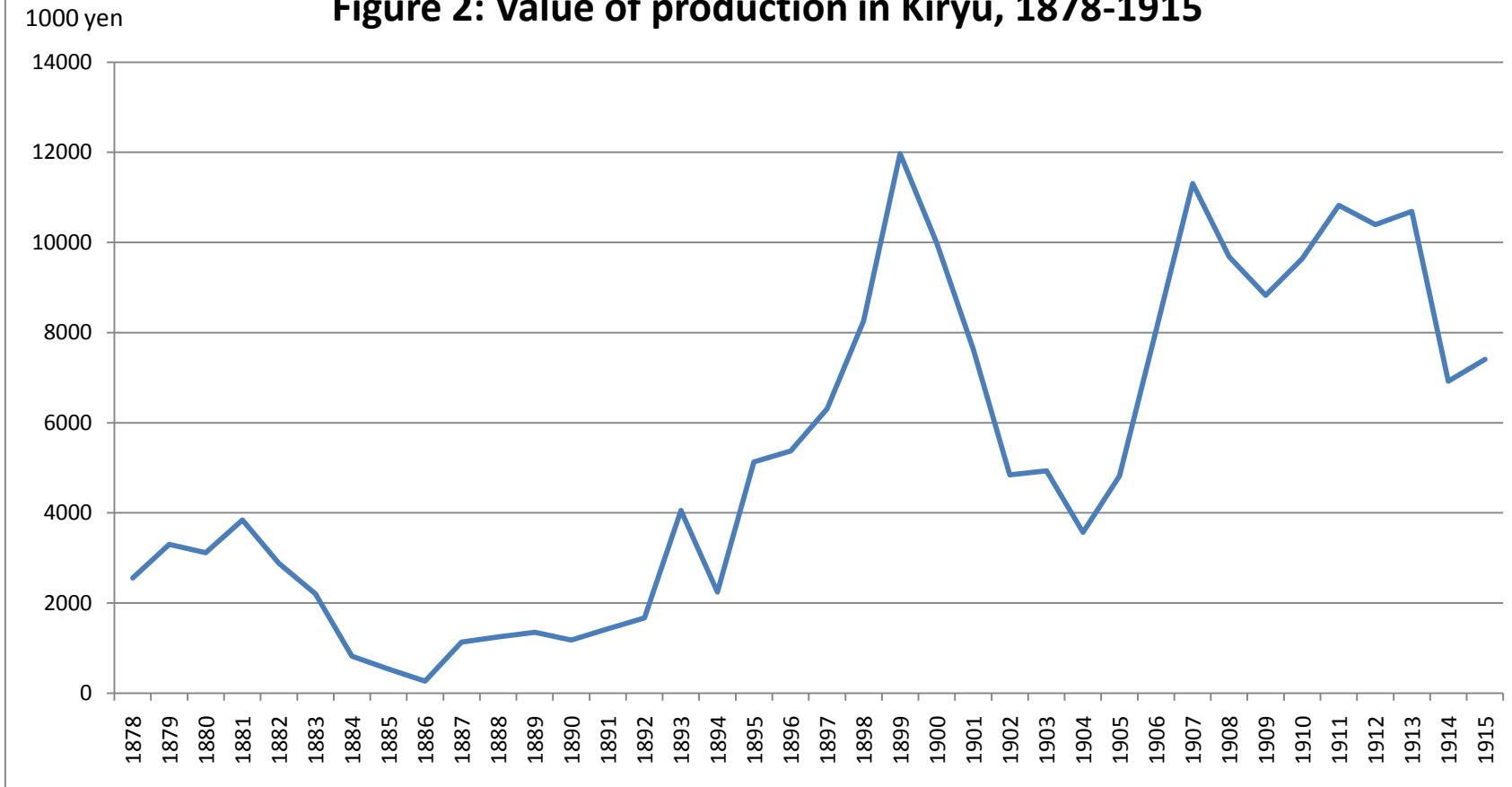
<sup>63</sup> Sonobe and Otsuka, *A Comparative Study*.

Figure 1. Silk Weaving in Japan, around 1910



Source: Hashino & Kurosawa's presentation slide at EBHA in Milan in 2009.

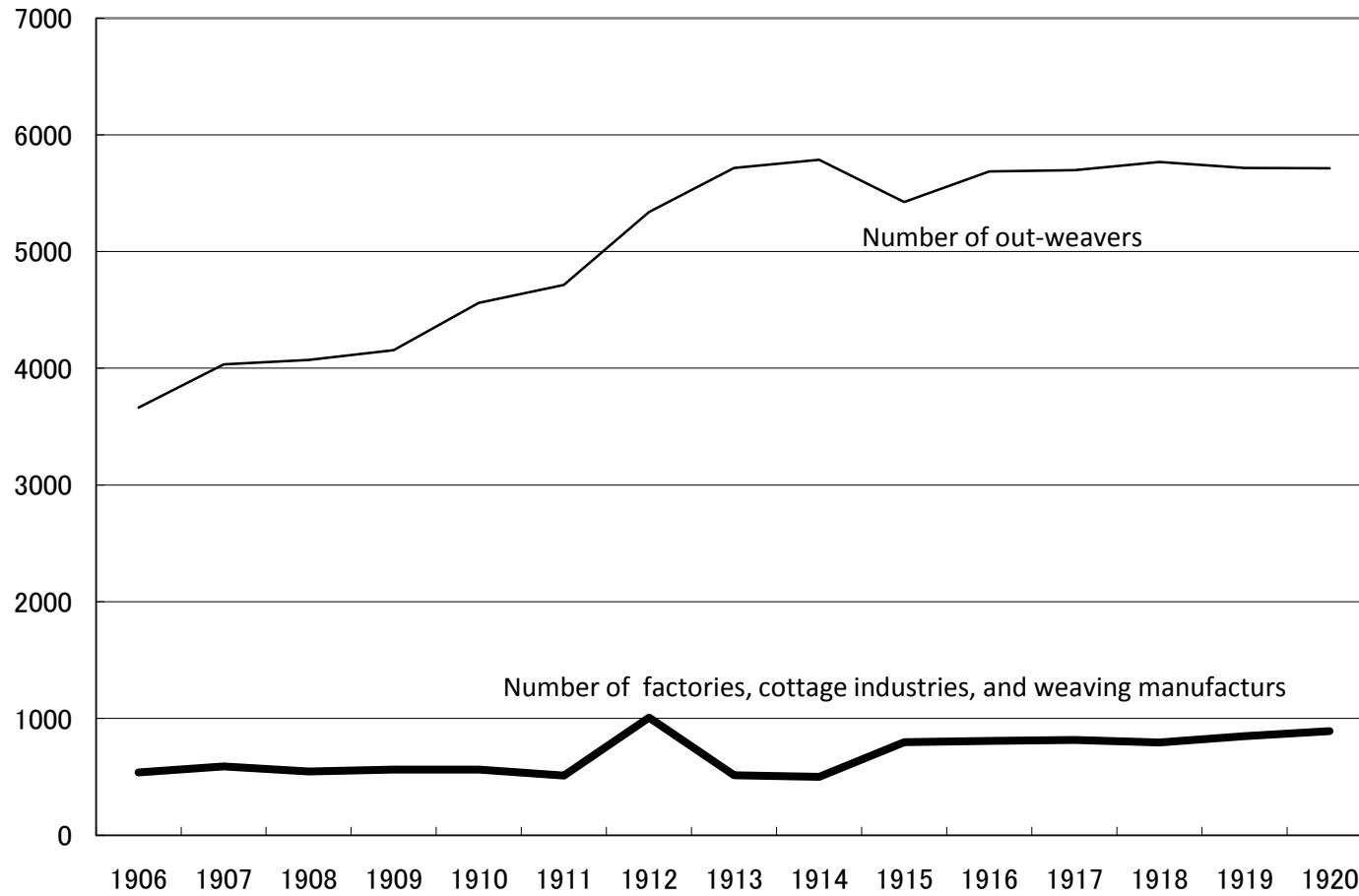
**Figure 2: Value of production in Kiryu, 1878-1915**



Source: *Report on History of Weaving Industry in Gunma Prefecture* [Gunmaku Orimonogyo Enkaku Chosasho] (from 1878 to 1901); *Statistics of Gunma Prefecture* [Gunmaku Tokeisho] (after 1902).

Note: Figures from 1886 to 90 were estimated. For realized values, we used price index for textile products (1934-1936=100) in *Estimates of Long-term Economic Statistics*

Figure 3: Number of Weavers by types in Kiryu, 1906–1920



Source: *Statistics of Gunma Prefecture* [Gunmaku Tokaisho](every year)

Figure 4: Process of producing silk fabric (left) and specialization organizing by weaving producer(right) in Kiryu around 1910

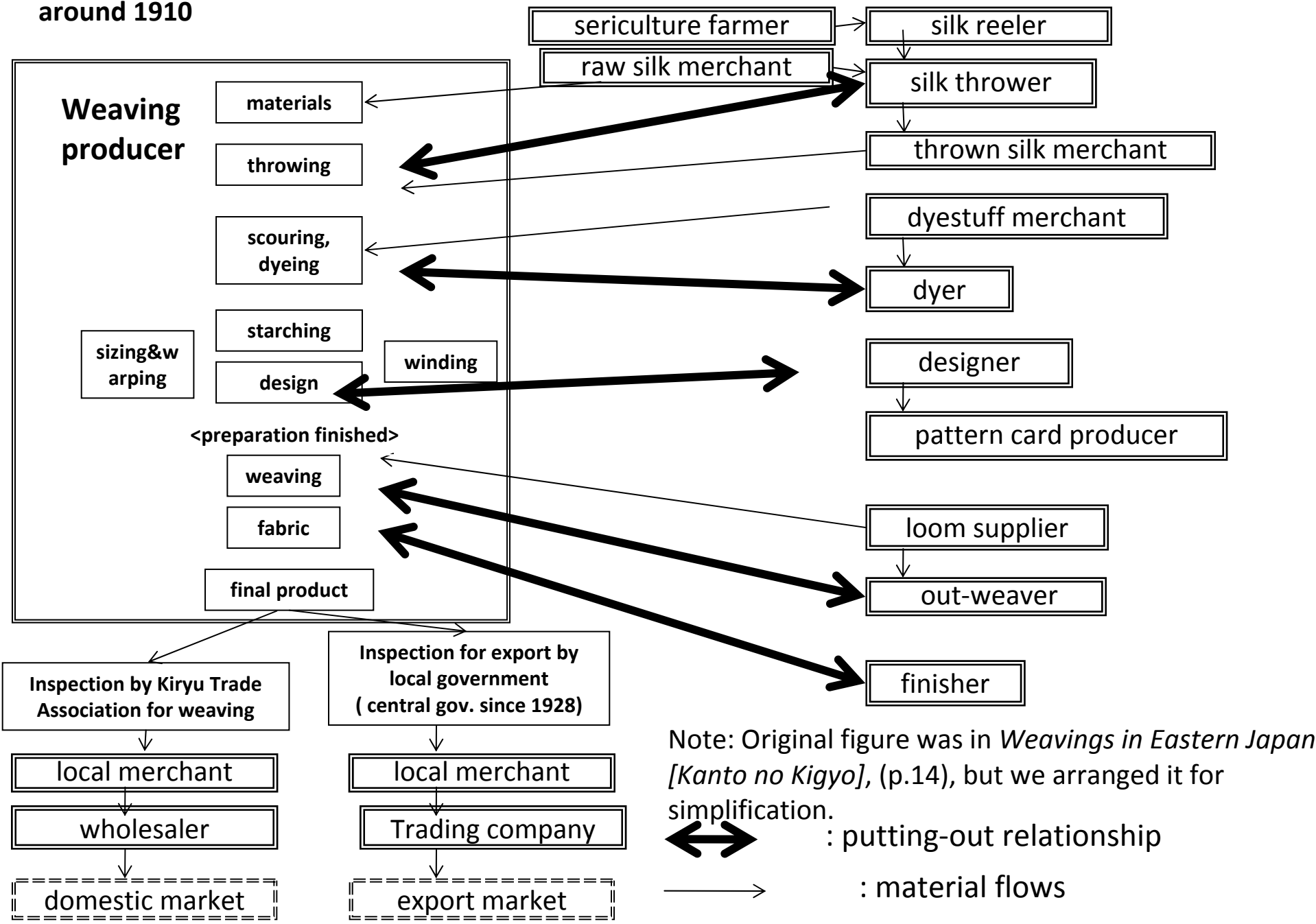


Table 1 Real Value of Major Silk-Weaving Prefectures (1000yen)<sup>1</sup>

Prefecture	Main District 3	year				growth rate (%) <sup>2</sup>
		1895	1900	1905	1910	
Yamagata	Yonezawa, <i>Tsuruoka</i>	876	2412	1810	5368	12.8
Fukushima	<i>Kawamata</i>	880	2703	4869	5370	12.8
Tochigi	Ashikaga	2499	1522	875	1155	-5.0
Gunma	Kiryu, Isesaki	5783	8525	6532	9672	3.4
Saitama	Chichibu	892	3160	2113	4549	11.4
Tokyo	Hachioji	2613	2356	2363	6783	6.5
Yamanashi	Gunnai	1162	4419	2451	4264	9.0
Niigata	Tochio	862	2641	2704	6575	14.5
Ishikawa	<i>Kanazawa</i>	1264	4318	8319	11803	16.0
Fukui	<i>Fukui</i>	4849	10777	15890	22071	10.6
Gifu	Gifu	700	2144	1223	3231	10.7
Shiga	Tango	733	1243	1163	1524	5.0
Kyoto	Nishijin	9290	21413	11642	19524	5.0
Fukuoka	Hakata	419	810	672	763	4.0

Notes:

1. All figures are deflated by price index for textile products (1934-36=100) in *Estimate of Long-term Economic Statistics of Japan since 1868: Price*, 192-93.

2. Annual average growthrate from 1895 to 1910.

3. Districts in Italic are exporters of *Habutae*.

Source: Hashino 2007, Table 1-4, 41.