

Chinese Cotton Industry in the 20th Century

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The first aim of this paper is to offer a new estimate of the output of Chinese cotton industry. Prevailing estimates have often been calculated from incorrect sources. This paper uses some new data, and calculates the output, by employing some new methods.

The second aim of the paper is to offer an overview of the development of Chinese cotton industry in the context of both Chinese and East Asian economic history. The modern cotton spinning mills could not have existed without a large number of weavers in the countryside as consumers of the yarn they produced. Most of them used relatively simple weaving machines, first imported from Japan and thereafter made in China. The overall pattern can indeed be characterised as labour-intensive industrialisation.

At the same time, the investors of modern cotton mills included foreign, including Japanese, firms. During the 1930s one third of cotton yarn and a half of cotton piece goods were produced by Japanese-owned mills, which had superior technology and marketing methods. But the development of Chinese-owned mills was equally remarkable. In the 1920s and the 1930s, some mills took root in the countryside, with the use of cheap raw cotton, while others located in urban areas competed with Japanese-owned mills and pursued efficient management. Many managers and engineers in such mills had studied in Japan.

1. A new estimate of the output of Chinese cotton industry

Several estimates of the output of Chinese modern cotton industry, which exists, do not accurately show the real situation of the industry, because they have often been calculated from the same incorrect sources. Using some kind of new data and methods to calculate the output, this paper will show more clearly the detailed process of the development of the modern cotton industry in 20th century China. It is a very important task for the understanding of Chinese industrial development, because the output of cotton yarn occupied about 20 % of the total modern industrial output [Makino, F., Kubo, T., and Guan, Q.: p.13].

First, we introduce six kinds of previous estimates of the output series of Chinese modern cotton industry, and discuss their quality.

[1] Association Statistics (Shanghai shi Mianfangzhi Gongye Tongye Gonghui Choubenhui (Preparatory Committee of the Shanghai Cotton Spinning and Weaving Association)) [1951]

This is a valuable statistics summarized from 17 series of statistics compiled by the Association of Chinese cotton spinning factories in the pre-war period. Originally called "Tables of Cotton Spinning Factories in China," they were published annually between 1919 and 1937, except for a couple of years in the 1920s when the statistics were not compiled. Investigations were not conducted during the war and most of the post-war period. Only one survey was conducted in 1947 and published in the following year.

This statistics recorded annual conditions of production, equipment and output of each factory compiled from their own reports. It

is the most comprehensive and inclusive output series for the Chinese cotton industry. However, besides the problems arising from missing years mentioned above, there also existed the following problems. (1) The items of statistics sometimes lost consistency. (2) Part of the factories' report does not seem to be very reliable. (3) Some factories, mainly composed of British and Japanese factories, did not respond to the requests for reporting; (4) Quite a large number of factories operating in both spinning and weaving did not report their own cotton yarn consumption for weaving (referred to "Takamura Estimate").

Chang's industrial production index, which was a most notable estimate in this field, basically adopted this statistics for the cotton yarn output series [Chang 1969]. At the same time, using simple methods to estimate and some fragmented data, he made his own cotton yarn output series.

[2] Wu Estimate (Wu [1947])

Although Wu only estimated the cotton yarn output for 1933, he made efforts to obtain accurate statistics by using annual converted values from the tax bureau statistics (statistics from the Controlling Committee of the Cotton Industry, one of the organizations attached under the National Economic Committee). He also added the output data in the Northeast region.

While Wu pointed out the importance of cotton yarn output by the factories operating in both spinning and weaving sectors, he nevertheless used the tax bureau statistics, which failed to capture this production. Cotton yarn output by the tax bureau naturally included only those products that were taxable, in other words, those that were sold on

the market. It excluded those used for the factory's own production. Also, Wu's estimate was limited to 1933. The tax bureau statistics themselves stopped in the first half of the 1930s. Therefore, this way of estimating cotton yarn would not be useful in constructing the time series.

[3] Yan estimate (Yan [1955: p. 363 (table 12)])

The Yan estimate used the cotton consumption data in the "Association Statistics", to calculate the cotton yarn output by assuming a 10% cotton loss in the process of spinning. In other words, cotton yarn output was estimated as cotton consumption times 0.9, rather than using the yarn output data themselves. The Yan estimate of yarn output is higher than the Association Statistics and the Chao estimate. This is probably due to the fact that this method could include the yarn output of the factories operating in both spinning and weaving. In this respect, the Yan estimate has its own value. However, reliable cotton consumption statistics were only limited to the period 1931-1936. Long-term output series, which is necessary to employ this method, could not be obtained.

[4] Chao estimate (Chao [1977])

The output data of cotton yarn from 1890 to 1919 are not covered by the Association Statistics, so Chao calculated them from the number of spindles and productivity per spindle. He derived the latter by assuming that cotton mills in those days could produce 250 pounds per spindle (about 0.625 bales per spindle) a year. He then linked his data to the Association Statistics data for 1920-1936 with some revisions.

Although the Chao estimate is methodologically consistent, there are several problems. First, the revision he makes in attempting to

include the yarn output of the factories operating in both spinning and weaving is extremely limited. Only the data of one or two factories were revised, when in fact such kind of factories were increasing in large numbers. In addition, he used the per capita output to revise the data for 1928 and 1936. But according to general understanding, the data on labourers in the Association Statistics are not reliable. Finally, the Chao estimate, which is supposed to have added up the missing data, turned out to be smaller than the Association Statistics data for several years. This is very odd.

[5] Takamura Estimate (Takamura [1982])

The Takamura estimate is an attempt to get figures closer to reality by revising the yarn output of the factories operating in both spinning and weaving. Calculating every factory's rate of cotton loss with the data of the Association Statistics we find that the calculated rate in some of the factories, operating in both spinning and weaving, is unusually high. Takamura regarded this as a reflection of the fact that these factories in fact did not include all of the yarn production in their output data of yarn. He used their output data of cotton piece goods to correct such an underestimate, assuming that 40 square yards of cotton piece goods required 11 pounds of yarn on an average. Although he revised the output data of Japanese mills from 1927 to 1936 only, we can use this method for estimating other output data series.

[6] Ding estimate (Ding [1987])

Based on the equipment data, Ding calculated yarn output from the average yarn productivity per spindle. He used the productivity data

for 1913, 1921, 1931 and 1936. The estimation is methodologically consistent. Because it included all of the yarn output of the factories operating in both spinning and weaving, the Ding estimate meant a significant upward revision of the data recorded in the Association Statistics. But the value of this estimate is diminished, as it is limited to 4 years only. Moreover, Ding's productivity data per spindle are not reasonable. They were 0.6248 bales for 1913, 0.6299 for 1921, 0.6344 for 1931 and 0.668 for 1936. It is likely that productivity did rise somewhat, but not this fast, since the average yarn output by spindle, measured by weight, should decline as the upgrading of the quality of cotton yarn proceeded during this period.

In sum, first, the Association Statistics is the most appropriate output data series, yet secondly, it is necessary to revise several parts of the data, and thirdly, while various estimates mentioned above had their own value, all of them had problems. Therefore, we estimated a new output series of cotton yarn.

From the above studies, we can summarize the following four types of methods to estimate.

1. Average output per spindle estimation (capital productivity series)
2. Average output per worker estimation (worker productivity series)
3. Yarn- cotton ratio estimation (cotton consumption series)
4. Estimation of yarn output based on the revised data in factories operating in both spinning and weaving (cotton piece goods series)

As indicated by above discussion, estimate methods 2 (worker productivity series) and 3 (cotton consumption series) would not be appropriate for the first half of the 20th century due to the lack of data. We have decided to adopt the following methods.

- 1) Before 1919. It is best to use method 1 (capital productivity series). We use the equipment statistics of the Ding estimate but use the methodology of the Chao estimate.
- 2) From 1920 to 1936. Our estimate uses the method of the Chao and Takamura estimates, but mainly use estimate method 4 (cotton piece goods series) to give a significant upward revision of the data in the Association Statistics.
- 3) 1937. As the Japanese invasion seriously damaged the statistical work, we cannot but make a rough estimate. Here we regard the output in 1937 was similar to the two thirds of output in 1936, because lots of cotton mills stopped their operation for about four or five months in 1937.
- 4) From 1938 to 1945. Basically we can use method 1 (capital productivity series). But as there are not enough data to calculate, we need to make an estimate from various sources. The detailed procedure for this estimate was explained in my paper presented for the symposium held in June 2004 in Tianjin.
- 5) From 1946 to 1948. We use John K. Chang's estimate. It is not so good estimate, but there are very few materials during this period because of the uncertain political situation.
- 6) 1949 and 1950. We can refer to the data in the Statistical Year Book published in the PRC.

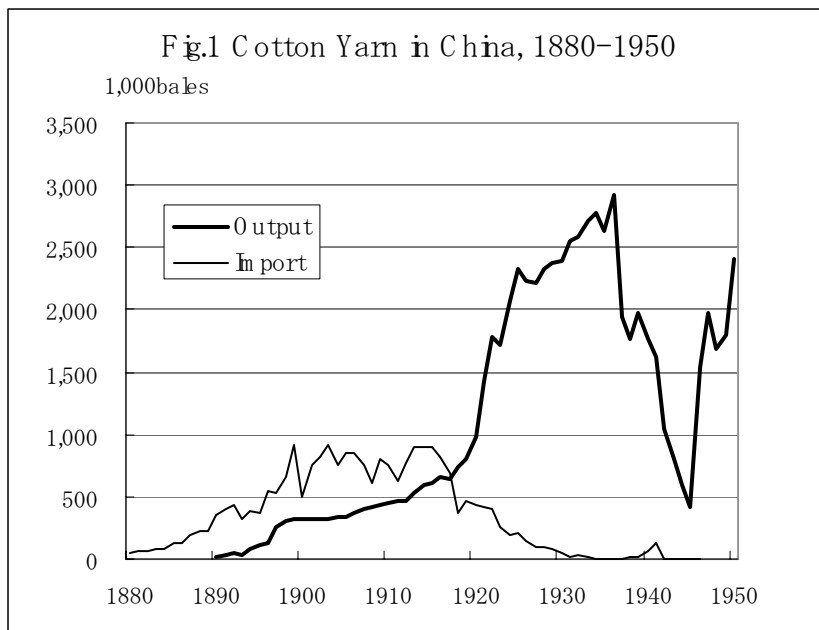
Our estimate in Table 1 and Figure 1 shows a very interesting process of the development of Chinese cotton industry during the first half of the 20th century. There was a rapid expansion in production stimulated by the conditions during and soon after the W. W. I. The excessive supply ensued in the first half of the 1920s. Then in the mid-1920s, production stagnated due to the National Revolution.

Afterward we can see a recovery, followed by a sustained increase. The worldwide depression led to a crisis of the overproduction in the first half of the 1930s, while by 1935-36, cotton industry recovered to arrive at its peak of development during the first half of the 20th century. In 1937, as the Sino-Japanese War began, the production decreased. But we should pay attention to the fact that cotton industry in several districts recovered to maintain about two thirds of the pre-1937 (pre-war) production level from 1938 to 1941, although the lack of raw cotton caused a sharp decline of the cotton yarn production after 1942. When W. W. II. ended in 1945, Chinese cotton industry turned to recovery. However it did not exceed the 1936 peak of the cotton yarn output before the 1950s.

Table 1 Chinese Cotton Yarn, Output and Imports, 1880-1950

(1,000 bales)

	<u>Output</u>	<u>Imports</u>		<u>Output</u>	<u>Imports</u>		<u>Output</u>	<u>Imports</u>
1880	0	51	1904	336	760	1928	2,334	95
1881	0	57	1905	345	853	1929	2,381	78
1882	0	62	1906	374	846	1930	2,393	54
1883	0	76	1907	403	757	1931	2,556	16
1884	0	87	1908	421	607	1932	2,590	32
1885	0	129	1909	436	801	1933	2,715	9
1886	0	128	1910	454	760	1934	2,780	7
1887	0	198	1911	468	620	1935	2,635	6
1888	0	227	1912	468	765	1936	2,920	3
1889	0	226	1913	527	894	1937	1,947	6
1890	22	360	1914	598	903	1938	1,773	9
1891	26	403	1915	608	895	1939	1,979	21
1892	47	434	1916	651	822	1940	1,764	58
1893	25	327	1917	650	691	1941	1,620	129
1894	84	386	1918	743	377	1942	1,036	0
1895	113	377	1919	808	468	1943	809	0
1896	123	540	1920	980	441	1944	590	0
1897	254	523	1921	1,427	424	1945	411	0
1898	299	652	1922	1,783	406	1946	1,543	1
1899	319	914	1923	1,716	258	1947	1,974	...
1900	319	496	1924	2,073	192	1948	1,680	...
1901	319	757	1925	2,326	215	1949	1,803	...
1902	319	815	1926	2,225	150	1950	2,406	...
1903	324	912	1927	2,211	98			



Based on our estimate, we can point out the following problems in the Chang's index which has been a representative work in this field [Chang 1969]. On the one hand, Chang's index overestimated the fall in cotton production in the first half of the 1920s. On the other hand, the 1930s, according to Chang, were a period of stagnation rather than expansion, therefore greatly underestimating the rapid recovery process for the cotton industry. For the 1930s, similar problems exist in the Chao estimate. In addition, Chang's index failed to reflect the wartime production, especially, from 1938 to 1941.

According to the worldwide statistics prepared by the ILO, the production of cotton yarn in Asia including China took up about 30 % of the world production in 1930 (Table 2). At the same time, the equipment for cotton yarn production in Asia was on the increase. Asia's share of the cotton spinning spindles in the world increased from 7 % in 1911 to 15.8 % in 1935 (Table 3). The difference between the output ratio and

the equipment ratio should be understood as a reflection of the productivity per spindle and the kind of cotton yarn produced. In any case, it was clear that Asian cotton industry including Chinese cotton industry was developing during the 1920s and the 1930s.

Table2 Production of Cotton Yarn, Principal Countries, 1930
(million pounds)

	<u>1930</u>	<u>%</u>
U.K.	1,047	11.3
France	543	5.9
Belgium	135	1.5
Germany	611 *	6.6
Italy	406	4.4
Netherlands	109	1.2
Austria	44	0.5
India	861	9.3
Japan	1,010	10.9
China	943 **	10.2
U.S.S.R.	660	7.1
U.S.A.	2,906 **	31.3
Total	9,275	100.0

Notes: * Germany 1928. ** China, U.S.A. 1929

Sources: International Labour Office, *The World Textile Industry, Economics and Social Problems*, vol. II (Geneva 1937) p.34.

Table3 International Distribution of Cotton Spinning Spindles, 1911-1935

	(1,000 spindles)					
	<u>1911</u>	<u>%</u>	<u>1927</u>	<u>%</u>	<u>1935</u>	<u>%</u>
U.K.	53,859	39.7	57,548	35.0	42,688	27.8
U.S.S.R.	7,397	5.5	6,946	4.2	9,800	6.4
Germany	10,300	7.6	10,900	6.6	10,157	6.6
France	7,200	5.3	9,522	5.8	10,157	6.6
Others	16,395	12.1	18,737	11.4	19,912	12.9
Europe	95,151	70.2	103,653	63.0	92,714	60.3
U.S.A.	28,500	21.0	37,374	22.7	30,110	19.6
Others	2,455	1.8	4,539	2.8	4,726	3.1
America	30,955	22.8	41,913	25.5	34,836	22.7
India	6,196	4.6	8,714	5.3	9,613	6.3
Japan	2,095	1.5	5,680	3.5	9,944	6.5
China	1,200	0.9	3,433	2.1	4,810	3.1
Asia	9,491	7.0	17,827	10.8	24,367	15.8
Others		0.0	1,223	0.7	1,861	1.2
Total	135,597	100.0	164,616	100.0	153,778	100.0

Sources: International Labour Office, *The World Textile Industry, Economics and Social Problems*, vol. II (Geneva 1937) p.44, p.88.

2. Development under the relationship between the modern sector and the traditional sector

We can point out several factors attributed to the comparatively rapid development of Chinese modern cotton spinning industry. Main factors referred to in previous research are as follows.

First of all, lots of foreign imports mainly came from British India in the second half of the 19th century had already created a large market for cotton yarn produced in mills by machines (so-called "Changsha", mill's yarn). Many weavers lived in Chinese countryside came to be accustomed to the use of Changsha, and thus they were ready to use

the mill's cotton yarn made in China. We know lots of notable materials about it. Some of the examples are as follows.

"This article, chiefly Bombay spinning, is in greater demand amongst the Natives, owing to its loose texture and rough surface as compared with English Yarns", Chefoo (Zhifu, Yantai, Shandong province, North China) Custom's Trade Report for the year 1887 wrote [CMC 1888: part II p.43]. Cotton yarn imported from British India became a most important item in the trade of many other ports in China.

Newchwang (Yingkou, Liaoning province, North-east China) Custom's Trade Report for the year 1887 discussed the reason of the increase of foreign yarn. "This is to be attributed to the vast difference in the price of Foreign and Native Yarn; the former sells for about Tls.57 per bale of 300 caties, while the price of latter ranges in the neighbourhood of Tls. 87 for a bale of the same weight. Foreign Yarn is thus procural at a little more than half the cost of the Native article, and has the additional advantage of being ready for the loom" [CMC 1888: part II p.2]. Chefoo Custom's Trade Report for the year 1886 also insisted that it (Foreign cotton yarn) is imported from Bombay where, no doubt, it can be produced more cheaply in Shantung [CMC 1887: part II p.41]. According to the China Maritime Custom's Report, the general trend was that "the conditions prevailing in 1903 have driven the peasant to take the less of the woven fabric and to substitute for the Yarn with which he and his family may themselves weave the material their clothing to the extent of 52 per cent of all Cotton Goods. In this, Manchester, Lowell, and Atlanta have alike suffered." [CMC 1904:partI p.3].

The second factor is technology. Of course foreign technology was necessary for the building of the cotton mills. All of the machines and

accessories were imported from Britain or America during the 19th century and the beginning of the 20th century. Tomizawa recently introduced a report by Mitsui Bussan, a big Japanese trading company, regarding the cotton spinning machines. The report pointed out that 62 % of the spindles in Chinese mills and 86 % in Japanese mills operating in China were imported from Britain in 1921 [Tomizawa 1999: p.25]. Although the core technology of spinning machine did not change, after 1920s, the main supplier of textile machines began to change from Britain to Japan and a part of machines were made by the machinery industry in China. Moreover, it is very interesting that many Chinese engineers who had studied in Japan played an important role in reforming the management style in Chinese mills during the 1930s. I have already discussed it in another paper [Kubo 2003]. So, we might say that the modern technology in Chinese cotton industry was first imported mainly from Britain and then from Japan.

Needless to say, building mills for cotton spinning industry had to be paid by a great deal of money. It was very important that China had enough capital to build the mills from abroad and domestic merchants. Only a few years after the first mill began operation, a large amount of foreign and Chinese capital was invested in Chinese cotton spinning industry. Yan Zhongpin introduced a lot of materials about it [Yan 1955].

The economic policy pursued by the Chinese National Government in the 1930s had a significant effect on the development of Chinese cotton industry, while the tariff policy did not have so a big influence on the protection of domestic industry, because the process of so-called import-substituted industrialization in the cotton spinning industry had completed before the 1930s. I discussed this topic in my

paper in the forthcoming book edited by Professor Sugihara. In their economic policy, the movement for reforming raw cotton was comparatively important.

All of the factors mentioned above promoted the development of the Chinese cotton industry. At the same time, we should pay special attention to the newly developed native weaving industry in the several areas in the Chinese countryside including Gaoyang xian in Hebei province, Nantong xian in Zhangsu province and Wei xian in Shandong province. Here I would like to introduce a case of Wei xian weaving industry in Shandong province.

Shandong located in the North China on the Huang Hai (Yellow Sea) is one of the most important provinces in modern Chinese economy. After a long period of pre-modern development until the 19th century, Shandong province started to change drastically under German influence in the beginning of the 20th century. For example, Germany introduced modern systems to the transportation sector, the mining industry, and foreign trade in Shandong. Germany's role was taken over and continued by Japan in the 1910s as a result of World War I. However, German and Japanese colonialism operated with distinctive differences. And although the Japanese occupation came to an end in 1922, the Chinese socio-economic development in Shandong continued to be strongly influenced by Japan during the 1920s-1940s. We can observe this trajectory through the example of the cotton industry and its development in Shandong.

We have several wonderful studies written about modern Shandong economy. Professor Zhang Yufa published a large volume on Shandong province as one of the regional studies of Chinese

modernization [Zhang Yufa 1982]. Professor Kenneth Pomeranz argued for diverse developments in so-called Huang-Yun area mainly including the western districts of Shandong [Pomeranz, Kenneth 1993]. And recently Professor Zhuang Weimin wrote an interesting book about the modernization process of Shandong market economy [Zhuang Weimin 2000]. However, those studies did not pay enough attention to the different characters between German rule and Japanese rule. In addition, some kind of nationalistic trend hid the complicated relationships among Chinese factors and foreign factors.

At first Shandong faced the impact of world trade through the port of Yantai (Zhifu). The foreign trade of Yantai increased very slowly before 1895 (See Tables 4 and 5). The turning point came in the period between the end of the 19th century and the beginning of the 20th century. Especially after the opening of the port of Qingdao the foreign trade of Shandong started to increase very fast, and the new port soon took over the role of Yantai, (Ibid.).

Table 4 Exports from Shandong

	<u>Yantai</u>	<u>Qingdao</u>	(H.G. Taels) <u>Longkou</u>	<u>Total</u>
1881-1885	182,745			182,745
1886-1890	445,868			445,868
1891-1895	646,186			646,186
1896-1900	1,680,539	6,456		1,686,996
1901-1905	3,584,420	726,702		4,311,122
1906-1910	4,078,331	3,943,083		8,021,413
1911-1915	4,908,064	9,621,027		14,529,091
1916-1920	5,745,023	18,687,981	117,082	24,550,085
1921-1925	10,460,808	27,165,842	1,336,840	38,963,489
1926-1930	5,872,920	35,796,641	2,746,196	44,415,757

Note: Average of Every 5 Years

Sources: CMC, *Returns of Trade and Trade Reports*

Table 5 Imports to Shandong

	(H.G. Taels)			
	<u>Yantai</u>	<u>Qingdao</u>	<u>Longkou</u>	<u>Total</u>
1881-1885	3,819,251			3,819,251
1886-1890	4,886,806			4,886,806
1891-1895	6,106,313			6,106,313
1896-1900	12,410,270	170,010		12,580,280
1901-1905	19,355,940	7,461,260		26,817,200
1906-1910	13,877,957	18,017,797		31,895,755
1911-1915	10,455,760	19,293,536		29,749,296
1916-1920	9,962,811	23,100,035	403,326	33,466,172
1921-1925	10,326,096	42,055,719	693,615	53,075,430
1926-1930	6,061,591	52,607,209	1,052,629	59,721,430

Note: Average of Every 5 Years

Sources: CMC, *Returns of Trade and Trade Reports*

Germany wanted to develop Shandong as their base camp for the enlargement of their interests all over the Far East. Their developing strategy was as follows.

1) Constructing the infrastructure: Germany built a modernized Qingdao Port, the Qingdao-Jinan Railway (the Shantung Railway), several mines managed by the Shantung Mining Company, and Qingdao city itself, which had an electric power station and water supply. All of such infrastructures contributed to the development of the economy of Shandong province. Especially the Qingdao-Jinan Railway played a very important role not only in stimulating the domestic trade within the province but also in increasing the foreign trade between Shandong and the world (See Table 6).

Table 6 Freights of the Qingdao-Jinan Railway

	<u>Passengers</u>	<u>Goods</u> <u>(tons)</u>		<u>Passengers</u>	<u>Goods</u> <u>(tons)</u>
1905	803,527	310,482	1919	2,545,268	1,733,376
1906	846,840	381,649	1921	3,272,078	1,904,229
1907	896,027	409,430	1922	3,777,054	2,093,815
1908	828,735	486,981	1923	3,664,721	2,013,477
1909	641,279	696,200	1924	3,992,994	2,284,935
1910	654,128	769,192	1925	3,650,300	2,063,367
1911	909,065	717,189	1926	3,435,939	1,635,355
1912	1,230,043	852,001	1927	3,550,875	2,128,274
1913	1,317,438	946,610	1928	3,070,194	2,460,500
1915	1,117,760	874,896	1929	3,671,134	2,214,125
1916	1,666,860	1,074,158	1930	3,734,731	2,052,206
1917	2,065,654	1,287,769	1931	3,272,454	2,599,308
1918	2,159,940	1,511,058			

Note: The numbers of 1914 and 1920 are unknown. Sources: TSM 1920b,

2) Activating the Commercial Network: Originally Chinese merchants had their own traditional network for commercial trade. When Germany came to Qingdao, they did not pay enough attention to the function of the network among Chinese merchants. But soon they understood its significance, and tried to activate it by transforming the old style of Chinese merchants' organization. In 1902 they supported Chinese merchants to establish their modernized organization called Qingdao Shangwu Gongju [TSM 1920a: pp.137-145]. According to its regulation, the organization could mediate commercial disputes, settle the property of bankrupt shops, and make plans to develop the Qingdao economy. It looked like a kind of Chamber of Commerce.

3) Promoting the Export Trade: When the trade of Qingdao started,

there were very few commodities to export. So Germany talked with the Chinese authorities to arrange a special Custom House system that could give big advantages to traders. At the same time Germany sought various Shandong products, which could gain foreign markets. They found straw braid, groundnuts, vegetable oil, silk, bristles, cotton, etc. to export to the world market from Qingdao. After 1907 it was very clear that the export from Qingdao started to increase rapidly (See Table 4). The foreign exchange earned from the export trade enabled Shandong to import more foreign commodities. In proportion to the export trade, the import trade of Qingdao was increasing in 1910s and 1920s (See Table 5).

As a result, the German strategy of developing the Shandong economy succeeded, which brought lots of benefits to Japanese and Chinese.

After 1914, Japan not only continued Germany's development strategy but also introduced some new factors to the economic development in Shandong. At first Japan expanded the modern infrastructure, originally built by Germany. The capacity of Qingdao electric power station was strengthened five (?) times, compared with pre-war period [TSM 1921]. The number of locomotives of the Qingdao-Jinan railway increased from 46 in 1914 to 94 in 1921. In 1913 there were 1,152 freight cars; the number in 1921 was 1,515 [CMC 1924: p.224]. Such an improvement of transportation system doubtlessly accelerated the increase of the volume of freights (See Table 6).

Table 7 Cotton Yarn in Qingdao, 1912-1936

<u>Year</u>	<u>Production in Qingdao</u>	<u>Imports from Foreign Countries</u>	<u>Imports from Other Ports</u>	<u>Exports to Foreign Countries</u>	<u>Exports to Other Ports</u>	<u>Demand</u>
1912	0.0	14.4	1.2	0.0	0.0	15.6
13	0.0	16.8	1.7	0.0	0.0	18.5
14	0.0	12.9	0.9	0.0	0.0	13.8
15	0.0	5.2	0.1	0.0	0.0	5.3
16	0.0	15.1	2.2	0.0	0.0	17.3
17	0.0	14.0	5.4	0.0	0.0	19.4
18	0.9	7.0	8.0	0.0	0.0	15.9
19	2.1	3.3	7.1	0.0	1.1	11.4
20	5.6	4.6	3.8	0.0	0.8	13.1
21	7.7	5.0	5.6	0.0	0.2	18.1
22	10.7	7.6	6.1	0.0	0.5	24.0
23	24.0	4.4	4.6	0.1	0.7	32.2
24	33.9	3.0	2.4	0.3	2.6	36.3
25	31.2	2.5	1.8	0.3	6.5	28.7
26	37.5	0.8	0.9	0.4	6.7	32.1
27	36.0	0.2	0.6	3.8	10.2	22.8
28	36.0	0.1	2.1	1.8	11.2	25.1
29	23.5	0.2	9.3	0.1	4.8	28.1
30	32.8	0.0	13.3	0.3	5.4	40.5
31	32.5	0.0	11.8	1.2	5.6	37.6
32	37.5	0.0	8.7	0.1	3.4	42.7
33	39.5	0.0	4.0	3.1	4.2	36.2
34	38.2	0.0	5.2	0.7	3.5	39.2
35	40.9	0.0	2.6	1.6	1.1	40.9
36	38.7	0.0	2.2	1.5	10.5	29.0

Sources: Kubo 1991: p14.

At the same time, the factory site of Qingdao was enlarged and sold out at a very cheap price to Japanese companies, including six cotton spinning mills, which occupied 230 hectare of the factory site. The direction of the industrialization in Qingdao changed drastically under the Japanese rule. Large cotton mills started to supply lots of cotton yarn for the weaving industry in Shandong province. The process of the

development of cotton industry will be discussed below. Most of the products of match industry were also consumed in Shandong. In other words, many modern factories built in Qingdao found their main markets in Shandong. Compared with the German period in which the export-oriented industrialization was promoted, we can recognize a new powerful trend of import-substituted industrialization. According to many research reports conducted by the Japanese Tsingtao Defence Army, even in the inner districts far from Qingdao, people lived there bought a considerable volume of industrial goods, including cotton yarn and matches brought with handcarts from the nearest station of the Qingdao-Jinan Railway.

As seven modern cotton spinning mills were built one after another in Qingdao from 1918 to 1923, imports of cotton yarn, which recorded 15,000 tons in the pre-war period, rapidly decreased. Production of cotton yarn reached the annual level of about 30,000 tons in the 1920s, while imports of cotton yarn almost disappeared (See Table 7).

It is very interesting to investigate the statistics of transportation of cotton goods by the Shandong railway (See Table 8). On the one hand, most of the cotton yarn transported from Qingdao were brought to Changyi, Gaomi, Weixian, Zhoucun and other specified districts where new rural weaving industry were developing. At the same time, many cotton piece goods were produced and transported from these districts (Ibid.).

Table 8 Transportation of Cotton Goods in Shandong Railway, 1915-1920

Railway Station			<u>1915</u>	<u>1916</u>	<u>1917</u>	<u>1918</u>	<u>1919</u>	<u>1920</u>
Qingdao	yarn	departure	13,179.0	14,981.3	12,075.0	16,089.9	7,469.5	14,593.6
		arrival	3.3	77.1	105.0	1,378.0	2,814.2	3,475.0
	pieces	departure	5,883.0	5,513.2	4,576.1	5,247.5	2,016.9	3,467.8
		arrival	55.8	501.5	150.6	179.7	137.3	306.8
Jinan	yarn	departure	314.1	82.9	120.0	173.2	148.1	856.6
		arrival	5,352.4	7,608.6	5,893.1	7,101.6	1,126.7	293.5
	pieces	departure	560.0	299.6	98.3	186.7	264.6	802.7
		arrival	5,539.6	6,131.4	4,739.5	4,914.2	1,597.8	2,564.5
Changyi	yarn	departure	0.0	6.1	0.4	0.9	0.8	9.5
		arrival	1,135.8	1,509.5	977.4	1,163.2	841.5	2,799.7
	pieces	departure	948.3	944.3	929.4	800.2	573.6	919.0
		arrival	78.9	37.7	33.2	6.6	86.7	167.5
Gaomi	yarn	departure	0.1	1.3	1.5	0.8	1.5	8.3
		arrival	782.4	431.8	428.6	646.6	586.4	1,444.8
	pieces	departure	5.6	1.3	1.6	7.4	1.2	3.1
		arrival	28.3	20.0	31.2	75.7	48.5	112.7
Wei xian	yarn	departure	9.8	10.1	65.8	29.1	9.8	12.1
		arrival	2,943.4	1,730.1	1,884.5	2,752.6	1,089.9	3,076.1
	pieces	departure	241.7	262.5	207.0	294.9	114.3	716.4
		arrival	1,003.8	204.6	158.6	393.5	464.8	864.3
Zhoucun	yarn	departure	44.9	21.1	15.4	37.7	10.6	88.9
		arrival	2,053.8	940.8	1,024.0	1,207.6	290.5	1,716.4
	pieces	departure	834.4	547.8	80.9	128.2	99.8	335.8
		arrival	1,627.7	391.1	500.8	900.0	228.8	1,243.5

Sources: TSM, *Santo tetsudo hacchaku kamotsu hinmeibetsu ruinen toukeihyo*
(Statistics of every item in every station in Shandong Railway)

According to the economic report appeared in the magazine of the Japanese Qingdao Chamber of Commerce, the main market for the Japanese cotton mills built in Qingdao was doubtlessly the newly developed rural weaving industry in the above-mentioned districts. Changyi, Gaomi, Weixian, Zhoucun and other specified districts were originally traditional centres of commercial network. But not all of the traditional commercial centres managed to transform themselves to the districts of newly developed weaving industry. So there is a problem why

the new weaving industry was developed in some districts and not in others.

In the case of Weixian, the chance for change came about 1906 when "Tielunji" was introduced from Japan [Yishi bao's Nongcun zhoukan = Village Weekly = no.154, cited from Mantetsu-HKC 1940: p.8, 11]. The meaning of the Chinese word "Tielunji" is "a machine with iron wheels". In fact, it means a reformed handicraft weaving machine, using fly shuttle and stepping operation system. "Jiaotaji", another Chinese name of the machine means a machine moved by stepping. There were many documents in various districts that the new weaving industry started just after this kind of machine imported from Japan or Tianjin [Xu Xinwu 1992: pp.405-406]. According to an interview with an old handicraft-weaving worker, the productivity per machine was improved about from 50 % to 100 % with the introduction of this type of reformed machine, as compared with a traditional handicraft type, although it needed more intensive work [Ibid: p.410]. As this type of reformed machine was soon to be made by the Chinese themselves, it became not so expensive.

The reformed handicraft weaving machines in Weixian were imported from Japan or Tianjin in the early period. But the Huafeng machine factory established in 1920 started to make an imitation machine of the Japanese machine called Ishimaru weaving machine [SZWW 1989: p.152-153, Mantetsu-HKC 1940: p10, 54]. As the machine made by the Huafeng factory was cheaper than the imported machine, it contributed to the development of the weaving industry in Weixian to a considerable degree. Teng Huchen (1883-1958), the founder of the Huafeng factory, had been working in the Qingdao shipyard where he

learnt the basic technique of machinery industry in his youthful days. From this example, we can see that the industrialization by the Qing Government before 1898 and German authorities from 1898 to 1914 played an important role in the training of machine workers in Shandong. According to the research by Mantetsu in 1939, the outline of the Huafeng factory was as follows.

Table 9 Outline of the Huafeng machine factory, 1939

Capital	C\$ 400,000
Workers	450
Equipment	Lathe 101 (*), Diesel engine 6, Electronic generator 7, Motor 22
Main production	(Average of three years from 1936 to 1938) Weaving machine 150, Ginning machine 236, Pump 140, Diesel engine 53, Electronic generator 15

**Note:* This was in the pre-war period. only 38 in 1938 Sources:

Mantetsu-HKC 1940: p.54-56

Doubtlessly the Huafeng and other machinery factories in Weixian supported the development of new weaving industry.

So-called "labour-intensive industrialization" was surely proceeding there. But strictly speaking, cotton weavers were not at all engaged in the traditional handicraft production. Although the mechanism of the machines were very simple, most of the weavers used the weaving machines, first imported from Japan and thereafter made in China.

In addition, Weixian weaving industry did not stay at the level of simple handicraft industry. In 1931, the Jixiangyun factory, one of the biggest weaving factories in Weixian bought twenty-one Toyoda weaving machines from Dalian [SZWW 1989:p120]. All of the Toyoda machines

were equipped not later than 1934 and moved by electronic power, supplied from the Weixian power station. Soon after this first step into the modern weaving industry in Weixian, some other weaving factories also adopted the same type of machines. According to the research by Mantetsu in 1939, there were at least nine factories operating the electronic power weaving machines, which resembled the Jixiangyun [Mantetsu-HKC 1940: p15-16].

During the 1920s and the 1930s, Chinese economic development could be seen under the Japanese influence. My article on the cotton industry in Qingdao shows an interesting example of the relationships between Chinese and Japanese economic activities [Kubo 1991]. Based on primary sources concerning the cotton industry in Qingdao from the 1920s to the 1930s, this paper deals with one of the representative cases of the relationships between Chinese and foreign enterprises in China. In that city, when Japanese cotton industrialists rushed to Qingdao after World War I, the famous bureaucratic entrepreneur Zhou Xuexi also built the Huaxin cotton mill. It is easy to document the keen competition between Huaxin and the Japanese cotton mills. But the relationship was not one of competition alone. Huaxin and the Japanese cotton mills followed different strategies in both production and marketing. Huaxin produced higher count yarns, which went mainly to the other treaty ports, while most of the Japanese mills produced coarser yarns sold in the rural textile centres in Shandong. Sometimes the Japanese mills and Huaxin cooperated with each other. For example, the Japanese mills supplied new cottonseeds to the Chinese side led by Huaxin in the first phase of the movement to improve the quality of the cotton grown in China. This cooperation, however, did not continue because the Chinese

side eventually decided to use a different kind of cottonseeds promoted by the Nationalist Government. This study joins the on-going discussion on the role of foreign capital in Chinese economic development. Some of the findings of this study coincide with the conclusions of Sherman Cochran's study of the Chinese tobacco industry.

Another question considered concerns factors allowing Huaxin to compete with the Japanese mills and enlarge its business during the 1920s and 1930s. This paper concludes that (1) Huaxin could get good cotton by direct purchase, (2) it actively introduced new technology, and (3) that the managerial skills of Huaxin's operators, including marketing techniques, were important factors.

Conclusion and Prospect

In summary, we should understand the development of Chinese cotton industry in the context of Chinese economic history. The modern cotton spinning mills could not have existed without those consumers who were working in the cotton weaving manufacturers in the countryside. In addition to the "labour-intensive industrialization", the capital-intensive industrialization was also proceeding. Most of weavers used weaving machines, first imported from Japan and thereafter made in China. Moreover, some of the mills in Weixian adopted the electronic power weaving machines in the 1930s.

After World War II all the Japanese mills in China were seized by the National Government, which put them under the management of a large state-owned company. After 1949 the PRC took over this company and put other privately owned mills under its control. In Hong Kong and

Taiwan, several new cotton mills were built by emigrant Shanghai businessmen and engineers. Thus the management resources of cotton mills were transmitted across the political boundaries, and set the pattern of industrialization in East Asia.

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Note: (J) Written in Japanese; (C) Written in Chinese.

Abbreviations:

CMC: China Maritime Customs, China Imperial Maritime Customs
(before 1911)

Mantetsu-HKC: Minami Manshu Tetsudo Kabushiki Gaisha Hokushi
Keizai Chosasho

(North China Economic Research Office, South Manchurian Railway
Company)

RTRHC: Rinji Tetsudo Rentai Honbu Chosa-bu (Research Section,
Provisional Railway Regiment, Qingdao Defence Army)

SZWW: Shandong sheng Zhengxie Wenshiziliao Weiyuanhui
(Committee of Historical and Cultural Materials, Shandong
Province Political Council)

TSM: Tsingtao Shubi-gun Minseibu (Civilian Office, Qingdao Defence
Army)

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