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Reconstruction of Hiroshima Industry 1945-1960

Toshiyasu Ito †

Abstract

Despite the center of Hiroshima City being ruined, manufacturing of Hiroshima Prefecture recovered to the prewar level several years after the war. We could point out such factors that contributed to reconstruction of Hiroshima industry: the damage of major plants located around Hiroshima City was much less than commonly imagined; Hiroshima Prefecture had relatively many workers, above all female workers, compared to the national average; the military institutions around Hiroshima were smoothly transferred into the private sector; release from regulation during the war stimulated the entrepreneurial spirit of enterprisers; the flow of people from the suburbs and evacuation places became a labor force.

Productivity of Hiroshima Prefecture had been below the national average, but it improved after the 1950s. Until the middle 1950s "the basic supporting industries" gathered in the center of Hiroshima City, which consisted of many specialized small and medium sized businesses. They have supported trial production and final assembly of parent companies.

Key words: Hiroshima, Reconstruction, Manufacturing

1. Preface

Many lives and many houses located in the center of Hiroshima City were completely destroyed on August 6 1945. Nevertheless, industrial reconstruction was carried out more smoothly than anticipated. This paper inquires into the reasons why Hiroshima industry could make a remarkable recovery. The measures we will take and considerations we will make are as follows:

1) We especially focus on the reconstruction of manufacturing in Hiroshima from the atomic bombing through the beginning of high economic growth period*1.
2) We will refer to the data of Hiroshima City as much as possible. But regrettably we could obtain little data on Hiroshima City, because statistics at that time were released only by the prefecture*2.
3) We will mainly address quantitative data, complementing this with qualitative materials such as historical research on local authorities and companies.

† Professor, Center for Research on Regional Economic Systems, Hiroshima University.
itot@hiroshima-u.ac.jp

*1 The object of *Census of Manufacture* was all establishments located in Japan excluding those with four or less regular workers between the outbreak of war and 1948, and excluding those with three or less employees after 1949. It does not include Okinawa Prefecture from 1945 through 1971. Army and naval arsenals during the wartime were not object of the census.

*2 Local governments of Japan are composed of prefectures, cities and municipalities. There were 46 prefectures, 205 cities, 1,797 towns and 8,518 villages in October 1945. Okinawa Prefecture was placed under the administration of the United States after the war until 1972.

2. Wartime through immediate postwar years

2.1 Change in employees

Manufacturing in Hiroshima Prefecture had been a key industry before the Second World War. According to statistics, manufacture and sales in 1935 amounted to 68.9% of the total production[*3]. The employees of manufacturing industries in 1940 were 100,040, which was ranked 9th out of 46 prefectures excluding Okinawa, compared to the ranking of 10th in population. They decreased almost by 10,000 in the year following Japan's defeat and fell to 90,482, ranked as 13th (Table 1). However in 1947 they increased almost by 10,000 and rose to 99,305, ranked as 11th. The number was 113,581 in 1948, which was a recovery to the prewar level and Hiroshima Prefecture was ranked 9th, while the rank of population remained 13th.

Table 1. Manufacturing of Hiroshima Prefecture 1940-48

	1940	1941	1942	1945	1946	1947	1948
Population (thousand)	1,823	1,826	1,897	1,885	1,901	2,011	2,044
Number of establishments	3,280	3,274	2,976	2,211	1,897	2,804	2,837
Number of employees	100,040	101,850	101,746	96,095	90,482	99,305	113,581
Official staff, engineers	8,583	10,594	10,934	14,739	14,754	16,843	15,844
Workers	88,337	87,424	86,686	76,802	69,456	77,756	92,352
Othesrs	3,120	3,832	4,126	4,554	6,272	4,706	5,385
Shipments (thousand yen)	446	489	462	745	2,010	7,279	19,853
HP of working motors (thousand)	144	183	173	n.a.	134	161	270

Note: The object is establishments with five or more regular workers (four or more full-time employees from 1949); Shipments are in nominal; The census were not carried out in 1943-44.

Resource: Ministry of Economy, Trade and Industry (Ministry of Munitions, Ministry of International Trade and Industry), *Census of Manufacture*; Statistics Bureau, *Historical Statistics of Japan*.

Although a considerable number of factories survived the war, they didn't work at all immediately after the war. The reason is that not only the infrastructure was terribly damaged, but also that Japan at that time faced severe a shortage of energy and raw materials. According to *Census of Manufacture* in 1946-47 which tallied shut down factories, the number of them across the country was 1,397 in 1946. There were 79 shut down factories in Hiroshima Prefecture, following Tokyo, Kanagawa, Aichi, Osaka and Hyogo. The shut down factories decreased to 496 (by 65%) in Japan and 20 (by 75%) in Hiroshima Prefecture. This also suggests that reconstruction of Hiroshima industry made smoother progress than expected.

Moreover, despite numerous deaths and injuries from the atomic bomb, major plants located around Hiroshima City were damaged much less than was commonly imagined. The corporate history reported for example that: "Thirty percent of buildings suffered damage, but equipment and instruments did nearly nothing" at Hiroshima Machinery Plant and Hiroshima Shipyard of Mitsubishi Heavy Industry, both of them located in about 4 km distant from the epicenter; "There were little damage other than blasting out of window glasses and collapsing of wood buildings, the factory resumed production on the day after the disaster" at the 20th Plant of Mitsubishi Heavy Industry, about 5.5 km from the epicenter; "Nevertheless the terrible blast made roofs of the factory blow off, window glasses shatter, window frames bend and some

*3 See *Statistics of Hiroshima Prefecture 1935*. The remainder were agriculture and forestry 28.4%, fisheries 2.4%, mining 0.3%.

buildings collapse, the damage was around thirty percent of the whole" at Toyo Kogyo (present Mazda), about 5.3 km from the epicenter (Hiroshima City 1984a, pp.13-22).

Changes in the number of employees from 1945 to 1946 should be noted. Employees of Hiroshima Prefecture in 1945 numbered 96,095. Though decreasing by about 4,000 from 1942, its rank relatively soared up to 7th out of 46 prefectures. Its share to the country increased from 2.2%, in 1940 or 1941, to 4.3% in 1945. But the number of employees dropped to 90,482 in 1946. It could be pointed out as the reason for the decrease that the Allied Powers began to discuss state reparation by Japan from January 1946. Some major plants around Hiroshima were designated as the object of compensation*4.

Though the number of employees in Hiroshima Prefecture decreased in 1946 and its share to the country fell down to 2.7% in 1946-47, the share went beyond 3% in 1948. The share of Hiroshima Prefecture in population remained 2.6% in 1942 and 1945-46, 2.5% in 1947-48 as well as the beginning of 1940s. Therefore the share of employees exceeded that of population at the first time after the war.

A statistics as follows tell us that a large number of manufacturing companies had already agglomerated in Hiroshima City in the beginning of 1950s. We can separate the data on manufacturing of Hiroshima City after 1950 from that of Hiroshima Prefecture. But the jurisdictional area at that time was different from the present area. The jurisdictional area of 1953 was near to the present. According to Hiroshima City (1984b, ff.470), the employees of manufacturing of the city in 1953 numbered 31,515 which is 25.2% of the prefecture, while the population of the city was estimated as 485,244, which was 22.9%. The employees per thousand of the population numbered 64.9 in the city which was denser than 59.1, the average of the prefecture.

2.2 Recovery of employees

Hiroshima City had a population of about 340,000 in 1944. It belonged to the largest sized group in the local areas, which included Kure City of 340,000 and Fukuoka City of 330,000. The population size of these cities followed the major cities in the Tokyo, Nagoya and Osaka metropolitan areas. But population of Hiroshima City lessened by half to 171,000 in 1946. The range of decrease roughly corresponded with the number of victims of the atomic bomb, which amounted to about 140,000 at the end of 1945.

Despite the grave decrease of population, the employees of manufacturing in Hiroshima Prefecture as a whole made a relatively slight decline. The average decrease ratio of employees in 46 prefectures was 50% between 1940 and 1945, 26% in 1946 and 18% even in 1948 compared to 1940. Meanwhile the number of employees in Hiroshima Prefecture decreased only by 3.9% (3,945 people) in 1945 and 9.6% (9,558 people) in 1946 compared to 1940. After they recovered in 1947 nearly the same level as 1940, they turned to increase in 1948.

These are the data on the establishments with five or more regular workers. *Census of Manufacture* during wartime and 1948 dealt also with the number of establishments and employees of the small sized businesses with four or less regular workers. Between 1940 and 1948 all establishments in Hiroshima

*4 The Allied Powers claimed state reparation in kind. It was said that they intended to take the level of production of Japan back to that of 1930-34 by removing equipment and instruments of the major plants. Such factories in Hiroshima were listed as Hiroshima Machinery Plant of Mitsubishi Heavy Industry, Toyo Kogyo and Hiroshima Plant of Japan Steel Works. The removal of equipment and instruments amounted to $160 million across the country. But the reparation issues disappeared in the spring of 1949 as the Cold War was increasing in importance. It was reported that "The concerned people of Hiroshima felt greatly relieved" after being told that they don't need to compensate (Hiroshima City 1984a, pp.63-79).

Prefecture declined from 16,589 to 6,515 by 61%. While those with five or more decreased from 3,280 to 2,837 by 14%, those with four or less decreased more from 13,309 to 3,678 by 72%. The share of small sized businesses fell from 80.2% to 56.5%. By contrast, the number of all employees declined from 129,989 to 124,298, only by 4.4%. As mentioned above, those with five or more increased from 100,040 to 113,581 by 13.5%. But those with four or less decreased from 29,949 to 10,717 by almost one third. The share of small sized businesses declined from 23.0% to 8.6%.

The employees of small sized businesses in Hiroshima Prefecture in 1940 are divided into 33.7% of employees and 66.3% of self-employed or family workers. This might suggest that it was small sized businesses, mainly consisting of self-employed or family workers, that decreased between 1940 and 1948. Above all, the small sized businesses located in the center of Hiroshima City were catastrophically ruined. In fact, compared with the days before the atomic bombing, the population on November 1 1945 decreased from about 65,000 to 11,472 (by 82%) within a radius of 1.5-2 km of the epicenter, from about 66,000 to 5,925 (by 91%) within 1-1.5 km, whereas from about 61,000 to 1,455 (by 98%) within a radius of 1 km (Hiroshima City 1971a, p.621).

Although the small sized businesses in Hiroshima City suffered serious damage, the establishments with five or more regular workers did not decrease fatally in Hiroshima Prefecture as a whole. This might serve for the subsequent recovery of Hiroshima industry. Not only residents in Hiroshima City, but also people coming in from suburbs and evacuation places would contribute it. “As daytime commuting people out of the city have greatly increased, the reconstruction has been accelerated”, *Chugoku Shimbun* on August 1 1946 reported (Hiroshima City 1971a, p.621).

2.3 Propping up of production

We must consider factors other than the above for the relatively smooth reconstruction of Hiroshima industry.

Firstly, capital stock as a factor of production made an earlier recovery from the destruction than expected. *Census of Manufacture* in wartime and several years after the war dealt with the number and horsepower of motors in work. The total horsepower of motors across the country increased from 7.9 million HP in 1940 to 9.9 million HP in 1946, while that of Hiroshima Prefecture declined from 144,000 HP to 134,000 HP (by 7%). But it rose up to 161,000 HP in 1947 and exceeded the level of 1940.

Secondly, general workers were relatively numerous in the country. In *Census of Manufacture* at that time, employees were classified into official staff, engineers, general workers and others by sex. The percentage of general workers in the employees in Japan was in the middle of 80% mark during wartime and in the higher 70% mark after the war. Meanwhile the percentage of Hiroshima Prefecture was in the higher 80% mark during wartime and dropped below 80% in the immediate postwar years, but went beyond 80% again in 1948. Even in 1945, the number of general workers in Hiroshima prefecture was ranked as 6th out of 46 prefectures, higher than that of total employees as 7th.

Thirdly, there were relatively many female general workers. The proportion of female general workers in 1940 was 33.8% in the country, 30.3% in Hiroshima Prefecture. Each of them increased a little to 34.6% and 31.1% in 1945. Hiroshima Prefecture was below the national average in both years. But looking at the details, while the total number of general workers decreased by 55% and female workers by 54% in the country between 1940 and 1945, the decline was by 13% and 11% in Hiroshima Prefecture. As the result, the

number of female workers in Hiroshima Prefecture decreased from 26,723 in 1940 to 23,883 in 1945 and 15,835 in 1946 year by year, but it turned to an increase after that. It rose to 19,322 in 1947 and 25,989 in 1948, and recovered nearly the same level as 1940.

Fourthly, the military institutions around Hiroshima were smoothly transferred into the private sector. The military institutions out of use for the Allied Powers were sold or leased out to private companies: for instance, Kanawajima Plant of Army Transport Department was sold to Hiroshima Shipyard of Mitsubishi Heavy Industry, Kure Naval Arsenal was sold to Amagasaki Steel, Harima Shipbuilding, Nichia Steel and NBC, an American capital company. These transfers finished until around 1948 (Hiroshima Prefecture 1983, pp.22-23).

Fifthly, release from the compulsory manufacturing systems during wartime as well as transfer from military to private sector stimulated the entrepreneurial spirit of enterprises from large companies to small and medium sized businesses around Hiroshima. Many people who had lost jobs at the military institutions also started businesses here and there. For instance, Toyo Kogyo (present Mazda), which had developed three-wheeler trucks in 1931, had been restricted to making them and forced to produce arms and military machine tools as a munitions company in the first half of 1940s. “As intervention of the government and military authorities to production was getting more and more intensive, the company was deprived of autonomy. They were nightmarish days in which we were obliged to become an arsenal”, the corporate history of Toyo Kogyo describes (Ebisu ed. 1950, p.123).

With the end of the war, Toyo Kogyo was discharged from the governmental intervention and was permitted soon by the Allied Powers to produce goods for civil use including three-wheeler trucks. “We managed to get out of the state of lethargy in the immediate postwar days more quickly than others. And we have built the basis for reconstruction step by step, while overcoming severe conditions and endeavoring to make the company democratic” (ibid, p.205).

Even though these factories possessed equipment and instruments, they couldn’t immediately produce what they wanted to do. Above all the shipbuilding industry, which had been one of the key industries of Hiroshima Prefecture, faced a seriously difficult situation, as they were regulated in the building of new ships by the Allied Powers. Therefore they were compelled to made pots and pans, hoes and ploughs, even the bells of Buddhist temples. Those days were called the “pots and pans period” of the shipbuilding industry (Hiroshima Prefecture 1983, p.173).

2.4 Productivity of manufacturing

Comparing some indices on manufacturing of Hiroshima Prefecture from 1940 to 1948 with those of the average of 46 prefectures excluding Okinawa, the following points should be mentioned (Table 2).

Despite the fact that manufacturing had been a leading industry in Hiroshima Prefecture, the scale per establishment or population was not so large in wartime. The number of employees per establishment was around 30 people in wartime, which was equivalent to about 90% of the national average. The number of employees per thousand of the population was also around 50 people at that time, which was below 90% of the national average. But both of them rose and exceeded the national average after the war, as the reconstruction progressed.

Productivity of manufacturing — which is measured in shipments per establishment, population or labor — in Hiroshima Prefecture had been below the national average. The reasons for lower productivity

of Hiroshima industry might be related to industrial composition as well as to factors of production: human resources, equipment and instruments.

Table 2. Level of manufacturing of Hiroshima Prefecture 1940-48

	1940	1941	1942	1945	1946	1947	1948
Employees per establishment	30.5	31.1	34.2	43.5	47.7	35.4	40.0
Employees per thousand of populaton	54.9	55.8	53.6	51.0	47.6	49.4	55.6
Share of workers to employees (%)	88.3	85.8	85.2	79.9	76.8	78.3	81.3
Shipments per establishment (thousand yen)	136	149	155	337	1,060	2,596	6,998
Shipments per population (thousand yen)	0.24	0.27	0.24	0.40	1.06	3.62	9.71
Shipments per employee (thousand yen)	4.5	4.8	4.5	7.8	22.2	73.3	174.8
HP of working motors per establishment	43.9	55.9	58.1	n.a.	70.6	57.4	95.2
HP of working motors per employee	1.44	1.80	1.70	n.a.	1.48	1.62	2.38
(National average=100)							
Employees per establishment (%)	91.3	92.1	89.3	113.9	121.5	107.1	109.2
Employees per populaton (%)	87.2	87.8	81.1	164.2	104.2	106.7	120.9
Share of workers to employees (%)	103.5	102.5	103.3	103.2	100.4	101.8	101.7
Shipments per establishment (%)	67.4	65.7	60.1	53.4	104.6	94.6	85.0
Shipments per population (%)	64.4	62.6	54.6	77.0	89.7	94.3	94.1
Shipments per employee (%)	73.8	71.3	67.3	46.9	86.1	88.4	77.9
HP of working motors per establishment (%)	75.0	82.5	85.1	n.a.	60.6	86.3	122.7
HP of working motors per employee (%)	82.2	89.5	95.4	n.a.	49.9	80.6	112.3

Note: The same as Table 1; Excluding Okinawa Prefecture.
Resource: Ministry of Economy, Trade and Industry (Ministry of International Trade and Industry), *Census of Manufacture.*

Growth of labor productivity is implemented through the combination of labor input, capital stock and knowledge. If we ignore the factor of knowledge, it depends on the level of capital stock per labor*5. In the case of Hiroshima Prefecture, as mentioned above, the number of employees recovered to the level of wartime, while the horsepower of working motors in 1946-47 was less than that in 1941-42. As the denominator became larger, capital stock per labor, which means here the horsepower of working motors per labor, remained at 50-80% of the national average and labor productivity did to be 80% mark of it. But it would presage the economic growth thereafter that capital stock per labor in 1948 rose by 12% points over the national average.

3. Restoration of infrastructures

Immediately after the atomic bombing, the restoration work of roads, bridges, railways, electric power and waterworks began. Needless to say, it at first aimed for military or defense purposes, relief of the victims, medical and sanitary activities. But as the means of living and transportation were restored

*5 Denote Y as production, K as capital stock, L as labor, α and β as distribution ratio of capital stock and labor, the most common and simple Cobb-Douglas production function is expressed as $Y=K^{\alpha}L^{\beta}$, where is supposed $\alpha+\beta=1$ in linear homogeneity. Divide both sides of the function by L, and $Y/L=(K/L)^{\alpha}$ can be derived.

gradually, they became to contribute as the basis for reconstruction of industries. Hiroshima City (1971a, 1971b, 1984a, 1984b) reported the situation of restoration of major infrastructures as follows.

The army and civil guards cleared the arterial roads in the city and eliminated obstacles very soon after the atomic bombing on August 6 1945 (Hiroshima City 1971a, p.586).

In the afternoon of the same day, trains began to shuttle back and forth between Hiroshima and Saijo, a suburban town 32 km distant from the former. They were utilized to transport the refugees from the city and the rescue parties into it. Railways across Hiroshima City were reopened one by one — the Ujina Line between Hiroshima and Ujina, a port 6.9 km distant from Hiroshima Station, on the next day[*6] ; the Sanyo Line, the trunk line between Osaka and Fukuoka, on August 8; the Geibi Line between Hiroshima and its northeastern suburbs on August 9; and the Kabe Line between Hiroshima and northwestern suburbs around August 18 (Hiroshima City 1971a, p.586).

Street cars suffered so devastating damage that only fifteen cars out of 123 could survive and only three out of fifteen cars were perfectly workable. But about 1.5 km section close to the center of the city was reopened as one way traffic on August 9. It was reported that this news encouraged people (Hiroshima City 1971a, p.587). On the same day, only two buses which did not suffer from the bombing restarted service between Hiroshima station and Ujina port via Hijiyama.

Electric power failed throughout the city at the same time as the bombing. The wooden power poles which survived from the destruction were only 6 out of 269 (2.2%) within a radius of 0.5 km of the epicenter, 33 out of 625 (5.1%) within 1 km, 182 out of 1,127 (16.1%) within 1.5 km, 347 out of 1,133 (30.6%) within 2 km, and 1,006 out of 1,051 (95.7%) within 2.5 km (Hiroshima City 1971b, p.755). However, fortunately Danbara Transformer Substation suffered little damage because it was protected due to Hijiyama, a small hill about 70 m above the sea, which is located in the southeast 2.3 km distant from the epicenter. Danbara Substation was emergently repaired and restarted to distribute the electric power for Ujina on August 7, where military establishments were located, and for Hiroshima Station and its surroundings on August 8.

Because the Ushida Filtration Plant, located over 2 km distant from the epicenter, suffered a little damage, despite a water leak in the center of the city, it did not stop water supply.

Hiroshima of one year later was recovering well. In august 1946, the number of railway passengers per day amounted to about 40,000 at Hiroshima Station, about 8,000 at Yokagawa Station, about 13,000 at Nishi-Hiroshima Street Car Station (Hiroshima City 1971a, p.621). The users of street cars per day almost doubled from 76,000 in 1946 to 134,000 in the next year (Hiroshima City 1984b, p.661).

In order to carry out the reconstruction of roads, parks and land readjustment systematically, *Hiroshima Reconstruction Plan* was adopted in 1946, and *Hiroshima Peace Memorial City Reconstruction Law* was enacted in 1949. The various plans were formally determined based on the law in 1952 (Hiroshima City Bureau of Urban Development 2009).

4. High economic growth period

4.1 A trigger for growth

Economy and industries of Japan from 1948 to 1949 faced a noteworthy change. The Allied Powers had adopted a planned and regulated economic policy at the beginning of the occupation. Though they issued

*6 The Ujina Line was discontinued in 1986.

the “Nine Principles for Economic Stabilization” in December 1948, which required Japan to keep a balance of public finance and to have control on prices and wages, they gradually became to put emphasis on free economic policy, being influenced by the changeover of USA in the occupation policy. It was the so-called “Dodge Line”, started in March 1949, that became to be a turning point. It stemmed from Joseph Dodge, an American adviser of the Allied Powers, who advanced a proposal for rehabilitation of Japanese economy. Its purpose was to keep down demands and control hyper inflation at that time.

Following the “Dodge Line”, rapid tightening of money market and public finance was implemented quickly. But this resulted in serious economic depression across the country as well as overcoming the inflation. According to *Labor Force Survey*, the number of unemployed in Japan rose from about 240,000 in 1948 to about 380,000 (increased by 58.3%) in 1949 and about 440,000 (by 15.8%) in 1950. The Bank of Japan Hiroshima branch reported the situation in the first half of 1949 that establishments which reduced personnel amounted to 122, and the discharged employees amounted to 3,466 in Hiroshima Prefecture (Hiroshima City 1984a, p.58). On the other hand, the rate of inflation steadily settled downwards. The Retail Price Index in Hiroshima City increased by 82.8% in 1947 from the previous year, did by 70.9% in 1948. It made a relatively low increase by 17.4% in 1949, at last it turned to decrease by 17.0% in 1950 from the previous year (Hiroshima City 1984a, pp.122-123).

Meanwhile, the number of establishments with five or more regular workers in Hiroshima Prefecture increased from 2,837 in 1948 to 3,029 in 1949, but the number of employees decreased from 113,581 to 105,095 by 7.5% (Table 3). As the rate of decrease in Hiroshima Prefecture was less than that of the national average 7.7%, the share rose a little from 3.09% in 1948 to 3.10% in 1949.

Table 3. Manufacturing of Hiroshima Prefecture 1949-52

	Actual number				Change ratio (%)	
	1949	1950	1951	1952	1949-50	1951-52
Population (thousand)	2,070	2,082	2,097	2,106	0.59	0.42
Number of establishments	3,029	3,812	4,338	4,294	25.85	−1.01
Number of employees	105,095	108,427	117,394	117,996	3.17	0.51
Shipments (million yen)	34,285	51,509	92,000	103,619	50.24	12.63
(Share to the country)					(% point)	
Population (%)	2.53	2.50	2.48	2.45	−0.03	−0.03
Number of establishments (%)	2.79	2.44	2.61	2.55	−0.35	−0.05
Number of employees (%)	3.10	2.81	2.77	2.73	−0.29	−0.04
Shipments (%)	2.38	2.25	2.28	2.24	−0.13	−0.04

Note: The same as Table 2. Resource: The same as Table 2.

People at that time generally took the “Dodge Line” negatively. For instance Hiroshima City (1984a, p.159) describes that “the Dodge Line went against the trend of economic policy and caused a sudden recession of regional economy”. By Contrast, economists these days take it positively. For instance Nakamura (1989, p.50) evaluates “it instructed Japanese companies to struggle with a severe free competition”. Yashiro (2013, p.13-16) appreciates that “it built the basis for the export driven economic development of Japan thereafter”.

At any rate, economy and industries of Japan at that time had been compelled to get rid of protectionist policy and dependence on domestic governmental demands. But the Korean War broke out before they accomplished such structural adjustment.

The Korean War began on June 25 1950 and brought Japan a special procurement boom. It "worked just as leverage for the reconstruction of Japanese economy" (Nakamura 1989, p.53). The Industrial Production Index of Japan, setting that of 1935 as 100, hovered at the 30 mark in 1946-47, stayed at the 50 mark in 1948 and at the 60 mark in 1949. But it soared up to 83.3 in 1950 and to 111.1 in 1951 which exceeded that of 1935. This special boom in demand worked as "an opportune shot in the arm to pull Hiroshima economy out of the fire" (Hiroshima City 1984a, p.295). As early as in the next month of the outburst of the war, its effects upon Hiroshima appeared. It was reported that "distressed Hiroshima economy by depression began to breathe and became soon to enjoy brisk businesses" (ibid).

4.2 Productive Prefecture Plan

Despite the fact that economy and industries of Hiroshima Prefecture managed to recover until around 1950, its growth rate or level was not beyond the national average. The number of employees of manufacturing in Hiroshima Prefecture exceeded 110,000 after the Korean War. Shipments amounted to ¥34 billion in 1949,¥52 billion in 1950, ¥92 billion in 1951 and ¥104 billion in 1952. But its share to the country declined at the beginning of the 1950s. The employees per establishment and per thousand of the population remained beyond the national average but their levels fell relatively (Table 4).

Table 4. Level of manufacturing of Hiroshima Prefecture 1949-52

	Actual number				Change ratio (%)	
	1949	1950	1951	1952	1949-50	1951-52
Employees per establishment	34.7	28.4	27.1	27.5	−18.02	1.54
Employees per thousand of populaton	50.8	52.1	56.0	56.0	2.57	0.10
Shipments per employee (thousand yen)	326.2	475.1	783.7	878.2	45.62	12.05
(National average=100)					(% point)	
Employees per establishment (%)	111.1	115.1	106.3	107.0	3.57	0.66
Employees per populaton (%)	122.3	112.2	111.7	111.3	−8.23	−0.32
Shipments per employee (%)	76.8	79.9	82.4	82.0	4.10	−0.51

Note: The same as Table 2.　Resource: The same as Table 2.

Among these indices, shipments per employee, i.e. labor productivity, had been below the national average until 1950, but exceeded 82% in 1951-52. This means that Hiroshima industry became to produce more valuable products with a relatively smaller labor force, still its level remained short of the national average.

In January 1951, Hiro'o Ohhara was elected as a new governor of Hiroshima Prefecture. He had advocated as one of his campaign promises that Hiroshima must change from being a consummative prefecture to being a productive one. His idea was discussed in a council and made public formally as the "Productive Prefecture Plan" in December 1952. It aimed at increasing income per capita of Hiroshima Prefecture from the level less than 80% of the national average to the level equal to it by 1956.

While the special demands boom triggered by the Korean War was coming to an end from the start of cease-fire conference in July 1951, the introduction of the "Productive Prefecture Plan" was timely. Just in April 1952 the Allied Powers lifted the regulation of new ship building and the shipbuilding industry around Hiroshima was returning to prosperity. This bucked up implementation of the plan as a tailwind.

The rank of Hiroshima Prefecture out of 46 prefectures in shipments of manufacturing went up from lower than 10th in 1946-47 to the 9th in 1949. It is generally said that income per capita of Hiroshima Prefecture reached to the national average in 1957. But according to *Annual Report on Prefectural Accounts 1955-1974*, it exceeded the national average by 3.3 points in 1955 and ranked as 8th compared to the 13th rank in population.

4.3 High economic growth of Hiroshima

The number of employees in manufacturing of Hiroshima Prefecture increased favorably from 108,427 in 1950 to 132,232 in 1955, 201,665 in 1960 and 263,194 in 1965. But its share in the country fell a little from 2.81% to 2.78% between 1950 and 1965 (Table 5). Meanwhile that of population also fell from 2.50% to 2.32%. On the other hand, shipments of Hiroshima Prefecture grew remarkably and its share to the country rose from 2.25% in 1950 to 2.31% in 1955, 2.48% in 1960 and 2.87% in 1965. The rank of Hiroshima Prefecture in population out of 46 prefectures remained 12th between 1950 and 1965, but 9th in both of employees and shipments*7.

Table 5. Manufacturing of Hiroshima Prefecture 1955-65

	Actual number			Change ratio (%)		
	1955	1960	1965	1950-55	1955-60	1960-65
Population (thousand)	2,149	2,184	2,281	3.22	1.63	4.45
Number of establishments	4,313	5,476	7,504	13.14	26.96	37.03
Number of employees	132,232	201,665	263,194	21.95	52.51	30.51
Shipments (million yen)	151,528	379,826	838,426	194.18	150.66	120.74
(Share to the country)				(% point)		
Population (%)	2.41	2.34	2.32	−0.10	−0.07	−0.02
Number of establishments (%)	2.31	2.30	2.17	−0.14	−0.01	−0.12
Number of employees (%)	2.66	2.65	2.78	−0.14	−0.01	0.12
Shipments (%)	2.31	2.48	2.87	0.06	0.18	0.39

Note: The same as Table 2. Resource: The same as Table 2.

Large industrial plants were located in Hiroshima Prefecture in succession from the late of 1950s to the early 1960s: Toyo Kogyo Fuchizaki Plant and Ujina-nishi Plant, Shin-Maywa Industry, Tokyo Roki (Hiroshima City), Babcock-Hitachi (Kure City), Mitsubishi Rayon, Mitsui Chemicals (Ohtake City), NKK (present JFE Steel Corporation, Fukuyama City), and so on.

As regards manufacturing of Hiroshima Prefecture in those years, two points must be specially mentioned.

*7 The rank of Hiroshima Prefecture in employees in 1955 was exceptionally 8th.

First, shipments per employee, i.e. labor productivity, improved steadily. This is clear from the facts, as mentioned above, that growth of shipments in Hiroshima Prefecture had changed being beyond that of employees. Labor productivity of Hiroshima Prefecture was 86.7% of the national average in 1955 and came close to it in 1960 but remained at 93.6% (Table 6). After that its labor productivity exceeded the national level by 3 points in 1965, because Hiroshima industry could catch the wave of high economic growth.

Growth of labor productivity at that time was driven mainly by capital investment across the country including Hiroshima Prefecture. Depreciation costs for tangible fixed asset — which might be regarded as representing the level of capital stock — increased from ¥142 billion in 1955 to ¥373 billion in 1960 by 163% in Japan, from ¥3.3 billion to ¥8.8 billion by 166% in Hiroshima Prefecture. In addition, shipments increased by 90% in Japan, by 105% in Hiroshima Prefecture between 1955 and 1960. Although Hiroshima Prefecture was a little beyond the national average in both of depreciation costs and shipments, the growth rate of employees was 52.5%, which was below the national average 53.1%[*8]. As the result, the growth rate of labor productivity was 34.4% beyond the national average by 10 points.

Table 6. Level of manufacturing of Hiroshima Prefecture 1955-65

	Actual number			Change ratio (%)	
	1955	1960	1965	1955-60	1960-65
Employees per establishment	30.7	36.8	35.1	20.12	−4.76
Employees per thousand of populaton	61.5	92.3	115.4	50.06	24.95
Shipments per employee (thousand yen)	1,146	1,883	3,186	64.36	69.14
(National average=100)				(% point)	
Employees per establishment (%)	115.6	115.5	127.7	−0.10	10.59
Employees per populaton (%)	110.7	113.5	119.6	2.54	5.40
Shipments per employee (%)	86.7	93.6	103.4	8.04	10.49

Note: The same as Table 2.　Resource: The same as Table 2.

Meanwhile the growth rate of depreciation costs for tangible fixed assets per employee, i.e. capital stock per labor, of Hiroshima Prefecture was 74.5% compared to that of 71.8% in Japan. The growth rate of capital stock per labor between 1955 and 1960 was much more than that of employees in Japan as well as Hiroshima Prefecture. This would suggest that both factors of labor and knowledge contributed less to the growth of labor activity. A brisk economic period that continued from June 1957 to December 1961 was called “Iwato Keiki”, meaning the greatest economic boom since the Japanese mythical age. At that time a phrase “Investment brings another investment” were born. It just expresses the situation of investment driven economic development. Above all Hiroshima Prefecture showed typically such a tendency.

Secondly, there was a thick spread of small and medium sized businesses in the center of Hiroshima City. Small and medium sized businesses in industrially agglomerated district such as Hiroshima are called “basic supporting industries” which support trial production and final assembly of parent companies by supplying casting, founding, forging, plating, cutting, grinding, machining, and so on.

Nevertheless small sized businesses located near to the center of Hiroshima City were destroyed

*8 Both of depreciation costs for tangible fixed asset and shipments in 1960 are made as real values at prices in 1955 with GDP deflator based on *National Accounts*.

almost completely, they gradually came back and started businesses there as the chaos after the war ended. According to *Census of Manufacture* at that time which was presented by prefecture, the number of establishments with three or less regular workers and their employees in Hiroshima Prefecture increased year by year from 7,059 establishments, 13,210 people in 1950 to 8,435, 18,493 in 1955 and 9,099, 19,552 in 1960. The share of employees to the country went up from 2.27% in 1950 to 3.45% in 1960.

Economic White Paper issued in July 1956 is well-known with the phrase "It's no longer postwar". In those days a dense agglomeration of "basic supporting industries" had already been born in the center of Hiroshima City. It is reflected in a recollection as follows by Toshio Uno, second president of Hirotec, which manufactures automobile doors as one of the first tier suppliers of Mazda.

In the late of 1950s when the antecedent company of Hirotec located at the seaside and produced automobile body parts, he was trying hard to develop a new field. "I often used to visit Toka'ichi-machi distant about 1 km from the epicenter. A lot of specialized small sized businesses and family-type operations had gathered there. It was an indispensable area for making something. I went to a steel dealer by bicycle and bought a piece of steel. After I cut it with a cutter which I bought at a machine-parts shop, I brought it to a heat treating company. They quenched and processed it into a metal mold for bathtub. They supplied not only materials and tools but also bolts and nuts in a single unit. We could just procure something according to the scale of each company. Toka'ichi-machi was a very convenient area for us" (Chugoku Shimbun 1994, p.16).

4.4 End of high economic growth

Manufacturing shipments of Hiroshima Prefecture in 1950 under the special demands boom were mainly composed of chemical & allied products (24.1%), food (19.8%) and transportation equipment (14.5%). After that the former two industries dropped out of the top three, instead, iron & steel and machinery & equipment entered. Due to these leading industries, the rank of Hiroshima Prefecture in shipments kept continuously the 8th or 9th out of 46 prefectures between 1952 and 1978. Hiroshima Prefecture went to the top in western Japan getting ahead of Fukuoka Prefecture in 1968. Its share to the country including Okinawa reached a peak with 3.17% in 1975. As that of population was 2.36% at the same year, it is clear that Hiroshima industry has specialized in manufacturing.

Meanwhile the rank of Hiroshima Prefecture in prefectural income per capita has risen up year by year from 8th in 1955, 7th in 1956, 6th in 1971, 5th in 1974 and marked 3rd in 1975 when the share of shipments of manufacturing peaked (including Okinawa since 1972). But its rank has gradually declined and has been below 10th or less after 1985.

Hiroshima industry has had the advantage of specialization in heavy industries such as transportation equipment, iron & steel and machinery & equipment from the post war reconstruction period to the end of the high economic growth period. Although it is true that these industries have been a pulling-up force for the regional economy, it is undeniable that they became burdens on the adjustment of industrial structure since 1980s.

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