A Note on Japanese Industrialization Pattern in Comparative Perspective

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This note gives a synoptical look at Japanese industrialization process in the order of standard periodization, and compares Japanese economic growth, especially in the early MEG stage, with those of nineteenth century European, and of postwar developing countries' development patterns. To this end, a revised income series was obtained, and characteristic features at similar income levels were put against the Chenery-Syrquin type "normal" variations. Among others, most idiosyncratic aspects of Japanese development pattern lie in the structure of production and sectoral productivity. Very high growth rate and slow structural change produced a large and increasing productivity gap, resulting in the demise of rural area.

I. Introduction

One cannot overemphasize the role of the Industrial Revolution or of industrialization (namely the change in industrial structure), or in the words of Kuznets, of modern economic growth (hereafter MEG), in the formation of modern Japan. During the period from 1885, generally regarded as the starting point of Japanese industrialization, to 1940, the net national product rose six-fold (at an average annual rate of 3.3 percent), and the share of manufacturing, mining and public utilities in the total product increased from 13.9% to 46.7%. These "leading" sectors grew at an average annual rate of 6.3%.

An accumulated literature exists on Japanese industrialization, but is too vast to review within the scope of this study (For bibliographical guides, see, among others, *Shakai Keizaisi Gakkai* 1984; Yonekawa 1985). This study aims only to offer a synoptical look at the industrialization process in the order of standard periodization,

and then to highlight the characteristic features of Japanese economic growth, especially in the early MEG stage, in comparison to the industrialization and development patterns of 19th century Europe and postwar developing countries.

II. Industrialization Process of Japan

According to Rostow, Japanese economy went through the "take-off" between 1885 and 1905 and experienced the "technical maturity" during the 1906-40 period (Rostow 1980, p. 425). Similar periodization was accepted by quantitative economic historians, whose works have been facilitated by the publication of the *Estimates of Long Term Economic Statistics* (hereafter LTES). That is i) transition to MEG, from the Meiji Restoration to 1885, ii) MEG1, encompassing the transition period and 1886-1905, iii) MEG2, comprising the first half, 1906-30, iv) the second half, 1931-52 (Ohkawa and Rosovsky 1965).

It is noteworthy that each of the above periods constitutes a full cycle of business fluctuations, as Figure 1 shows. The existence of these long swings since the early Meiji era can be detected from various sources. Table 1 (a), among others, indicates that periods of relatively high growth rates (booming phase: U) and of relatively
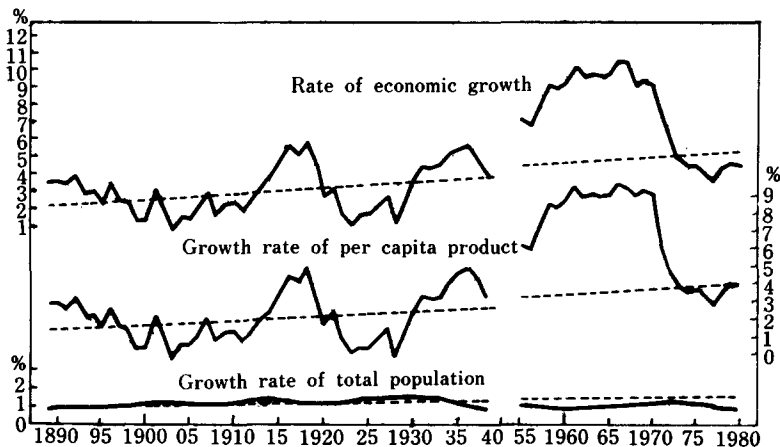

FIGURE 1
ECONOMIC GROWTH RATE, POPULATION GROWTH, AND GROWTH OF PER CAPITA GNE,
1889-1980
Source : Minami (1986, p. 44).

TABLE 1

AVERAGE ANNUAL GROWTH RATE BY BUSINESS CYCLE PERIOD

(Unit : %)

Phases (Number of Years)	GNP	Population	Per Capita GNP
(a)			
I (U) 1887~1897 (10)	3.21	0.96	2.25
II (D) 1897~1904 (7)	1.95	1.16	0.96
III (U) 1904~1919 (15)	3.40	1.19	2.21
IV (D) 1919~1930 (11)	2.27	1.51	0.71
V (U) 1930~1938 (8)	5.01	1.28	3.73
VI (D) 1938~1953 (15)	0.37	1.36	−0.99
VII (U) 1953~1969 (16)	9.99	1.03	8.96
(b)			
I′ 1887~1904 (17)	2.65	1.04	1.61
II′ 1897~1919 (22)	2.90	1.18	1.72
III′ 1904~1930 (26)	2.92	1.32	1.60
IV′ 1919~1938 (19)	3.42	1.35	2.07
V′ 1930~1953 (23)	1.99	1.29	0.70
VI′ 1938~1969 (31)	5.33	1.06	4.27

Source : LTES Vol. 1 (1974, pp. 16-7)

low growth rates (declining phase: D) alternated in the long-run economic growth of Japan. The table also reveals another special phenomenon, trend acceleration, which refers to the lengthy duration of the process whereby the growth rates increased over time, as witnessed by the historical record of growth by period. It is apparent that average growth kept rising during the booming phases, while in the declining phases, the rate rose from II to IV, and decreased from IV to V. Table 1 (b) clarifies the characteristic trend acceleration by collating trough to trough and peak to peak growth rates over a longer time span (Note that the low growth of (a) VI and (b) V′ was due to war).

The apparent synchronization of the long swing and the generally agreed periodization may have reflected certain symbiotic relations with the trend acceleration aspects.[1]

The long swing manifests itself in the capital formation pattern as well. Of course, the troughs and peaks preceded those of the GNP series (Figure 2), and have some irregular short-term deviations,

[1] This is the basic hypothesis of, among others, Ohkawa, Rosovsky, and Minami. It is yet to be supported by more persuasive evidence.
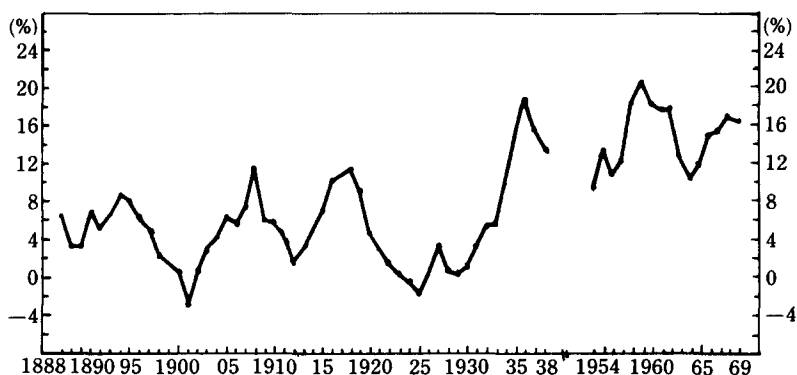
FIGURE 2

GROWTH RATE OF GROSS DOMESTIC CAPITAL FORMATION
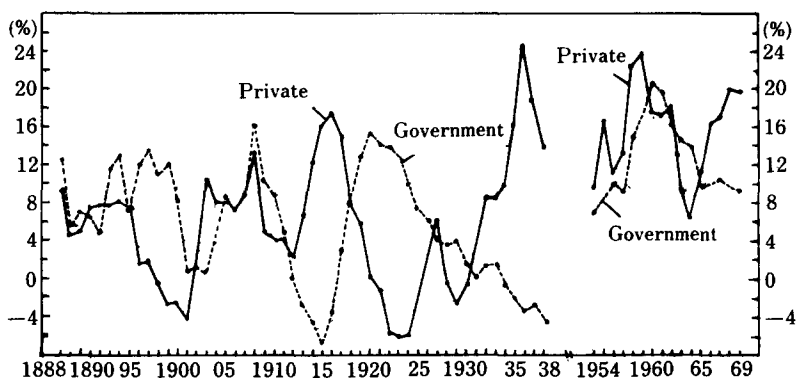
Source : LTES Vol. 1 (1974, p. 32).

FIGURE 3

GROWTH RATE OF GROSS DOMESTIC CAPITAL FORMATION BY SECTOR

Source : LTES Vol. 1 (1974, p. 33).

especially in the 1910s. However, the nature of investment behavior explains away the earlier timing of the cycle, as well as the seemingly incongruent short-term shocks, to make the two cycles basically conform.

Discussion of capital formation sheds some doubtful light on the prevailing argument that government played a substantially greater role in Japanese economic modernization relative to Western Europe's. Figures 2 and 3 draw almost the exact timing of fluctuations in total capital formation and in private investment. This probably implies that private investment ruled the pattern of long swing

in total fixed capital formation. Also of importance is the role of non-agricultural investment in shaping the pattern of investment fluctuation, while agricultural capital formation not only grew less rapidly but did not influence the variation in the rate of total domestic fixed capital formation.

The transition to MEG is characterized by a series of institutional reforms. Investigating these reform measures, however, in such broad fields as politics and administration, agriculture, fiscal system, and money and banking, is beyond the scope of this paper. A brief remark on their implications for Japanese industrialization will suffice for our purposes.

First of all, feudalism was abolished, and the clans surrendered their fiefs to the government (so-called *Hanseki Hōkan*). Soon, prefectures were established to replace the "han" (*Haihan Chiken*), and the old financial and administrative system associated with feudalism disappeared. Restrictions on freedom of movement and enterprise that had been the legacy of the old regime were abolished. The equality of the various social classes before the law was declared, and local barriers to communications and regulations on internal trade were loosened. The complexity of the various "samurai" classes was simplified at first, and their status was virtually demolished by the reform that substituted rice stipends with pension bonds of a far lower value (*Chitsuroku Shobun*).

The Land Tax Reform (*Chiso Kaisei*), which was intended to establish a unified and stable financial base, resulted in the official recognition of free private land ownership and of the principle that the landlord alone is levied tax on his land, and established a fixed monetized tax system based on land value, assessed with universal nationwide measures.

Along with these institutional reforms, the government tried to reorganize the monetary and banking system by introducing American-style national banking, and promoted railroads, telegraphs, and postal services, which were all pursued under the auspices of the so-called "Shokusan Kogyo" policy. In addition, public enterprises were launched in such industries as the military venture of shipbuilding, and silk-throwing, coal, copper, cement, and glass products. Support was given to private businesses in the major sectors also, through the leasing of equipment and lending of financial capital. Joint stock companies were encouraged for this purpose. This Shokusan Kogyo policy, however, was related to the trend of the centralization of power and of the state apparatus, and was to be

carried out in favor of particular business groups, with the sacrifices of a large mass of peasants who bore the taxes. Otherwise, the "Kogyo" fund contributed substantially to domestic capital formation, although it constituted only a small portion of the total government expenditure.

Unfortunately, this expansionary policy, in the midst of fiscal pressure due to the cost of financing civil wars following the Restoration and other administrative emergencies, brought about a budget deficit, inflation, and balance of payment difficulties, and had to be replaced by a restrictive one, the so-called "Matsukata" Finance. Namely, after 1881, public enterprises were sold off, subsidies to public utilities and other major private firms were reduced, indirect taxes such as excises on alcoholic beverages and tobacco were introduced, and the Bank of Japan was established to stabilize the currency and to maintain the convertibility of the Yen to silver. Money stock was reduced by 20 percent between 1881 and 1885. In consequence, the price level dropped sharply, with the rice price decreasing to half the previous record.

The major effect of the Matsukata Finance was that it paved the way for the private sector to participate more freely in leading the development of modern economic sectors. Thus, in the second half of the 1880s, substantial recovery occurred in basic industries, with railroads and cotton-spinning stimulated by higly profitable private investment. On the other hand, the Matsukata deflation, so favorable to businessmen and financial investors, was no blessing to the agricultural sector. Numerous small peasants were denigrated into croppers (between 1883 and 1891, the share of owner-operated farm households declined from 39% to 33%), although this may have contributed to some extent to the supply of industrial labor later. It is worth adding that the privatization of public enterprises was carried out to the advantage of established monopoly merchants, so that they naturally took the position of pioneers in certain manufacturing industries. Other characteristics of the transition period include government activities in borrowing foreign capital and technology, promoting international trade, and directing the Hokkaido development project.

Industrialization during MEG1, including the transition period, was led by textiles. As indicated in Table 2, the share of textiles in total manufacturing production increased rapidly during the period, but those of lumber, chemicals, stone, clay and glass products, iron and steel, and nonferrous metals decreased. Among textiles, silk and

TABLE 2

MANUFACTURING: SECTORAL COMPOSITION OF OUTPUT IN CURRENT PRICES, 1874–1940, 1952–70

(Unit : %)

Period	Food Products	Textiles	Lumber & Wood Products	Chemicals	Stone, Clay & Glass Products	Iron & Steel	Nonferrous Metals	Machinery	Printing & Publishing	Others
1874~1883	36.2	26.5	5.2	18.1	2.3	0.78	2.5	2.6	0.29	5.8
1877~1886	37.0	27.8	4.9	26.6	2.0	0.66	2.6	2.4	0.34	5.7
1882~1891	36.8	33.1	3.6	13.5	1.8	0.62	2.6	2.2	0.37	5.1
1892~1901	33.3	40.2	3.4	10.9	1.8	0.54	1.9	2.8	0.46	4.8
1897~1906	35.3	35.0	3.7	11.3	1.9	0.86	2.1	4.4	0.73	4.7
1901~1911	35.2	32.6	3.3	11.6	2.3	1.4	1.9	6.0	1.0	4.7
1912~1921	22.9	34.8	2.4	10.7	2.6	5.0	3.4	13.5	1.3	3.5
1917~1926	23.8	36.5	2.7	10.3	2.9	4.7	2.7	11.4	1.7	3.4
1922~1931	25.5	35.7	3.1	11.0	3.0	4.8	2.3	8.9	2.4	3.4
1927~1936	21.0	31.8	3.0	13.2	2.7	7.7	2.7	12.0	2.6	3.3
1931~1940	15.2	24.3	3.3	15.4	2.4	12.1	3.1	18.7	2.1	3.5
1952~1961	16.3	14.1	4.6	17.6	3.4	13.2	4.5	21.3	2.8	2.2
1957~1966	14.5	11.2	4.8	17.0	3.5	13.1	4.5	25.6	2.9	2.9
1961~1970	13.0	9.2	4.8	16.2	3.5	13.3	4.7	28.9	3.0	3.3

Source: LTES Vol. 10 (1972, pp. 140–3), Ohkawa and Shinohara (1979, p. 105).

TABLE 3

TEXTILE PRODUCT'S SHARE OF TOTAL MANUFACTURING PRODUCTION AND TOTAL
COMMODITY EXPORTS, 1868–1940

(Unit : %)

	Raw Silk	Cotton Yarn	Subtotal	Fabrics	Total
(a) Share of Total Manufacturing Production					
1874~1880	5.5	0.5	6.2	11.0	17.2
1881~1890	7.1	2.6	10.0	13.0	23.0
1891~1900	8.7	6.8	16.1	16.1	32.2
1901~1910	7.4	6.6	15.1	12.6	27.7
1911~1920	6.9	8.0	15.8	14.3	30.1
1921~1930	8.1	6.1	15.7	14.9	30.6
1931~1940	3.1	3.9	9.0	10.2	19.2
(b) Share of Total Commodity Exports					
1868~1880	35.6	0.0	47.1	0.1	47.2
1881~1890	36.2	0.0	41.7	0.8	42.5
1891~1900	30.2	6.5	39.2	1.9	56.1
1901~1910	27.5	8.4	38.3	12.2	50.5
1911~1920	23.8	7.9	34.3	16.5	50.8
1921~1930	37.2	3.8	42.7	25.1	67.8
1931~1940	25.5	1.0	27.9	25.9	53.8

Source : LTES Vol. 10 (1972, pp. 141-3, 188-9, 194-5), Minami (1986, p. 28).

cotton were most important (see Table 3). Since the opening of
ports, silk throwing factories were established to meet the foreign
demand for raw silk, and these were operated by small and medium
firms under the control of traditional commission houses (tonya).
The silk business was long regarded as a lucrative by–employment
for Japanese peasants, and once the impetus was given in the form
of government subsidies and the support of large trade merchants,
the industry was bound to thrive. On the other hand, cotton spinning
started as an import substitution industry, but made revolutionary
progress toward large–scale mechanized factories, and thus re-
corded export surpluses after 1897. Altogether, Japanese textiles
succeeded in synthesizing the tradition of rural handicrafts and the
imported western technology. Other than textiles, mining started to
prosper as Zaibatsu put interests. Metallurgy and engineering did
not yet take off despite heavy government support.

    The critical distinction of MEG2 from MEG1 lies in that while
the modern sector had to depend on the accelerated growth and

savings of the traditional sector because of difficulties in retaining
its own profits and importing foreign capital in MEG1, the modern
sector obtained a certain degree of independence from the tradition-
al sector and began to realize its potential for sustained growth in
MEG2 (Ohkawa and Rosovsky 1973, p. 28). That is, during MEG1,
the rise in the productivity of the traditional sector, in agriculture
for example, through the dissemination of new farming techniques
(*Meiji Nōhō*), enabled the growth of the modern sector by alleviating
the latter of tax burden, capital formation, foreign exchange, and
labor supply problems. The nurturing potential of the traditional
sector was exhausted by 1905-10, the end of MEG1, and it is main-
tained that the modern sector had acquired the ability to sustain
itself by then.

Figure 3 shows an interesting change in the capital formation pat-
tern in MEG2, especially around the 1910s. During the first phase
of MEG, government investment played an important role in total
capital formation, exceeding private investment in growth rates. In
the post-1910s period, the synchronous pattern of private and gov-
ernment investments disappeared, to be replaced by a mirror image
fluctuation. This has been interpreted as the result of sup-
plementary government investment following the lead of private in-
vestment after a time lag. Therefore, MEG2 has often been de-
scribed as a new stage of capitalist development in which private
capital began to rule independently (LTES Vol. 1, p. 33).

World War I was a boon to Japanese MEG2. Wartime buoyancy
lasted for five years, with Oriental markets which had been mono-
polized by Western suppliers open to Japanese manufactures such
as textiles, and with munitions exports to belligerents, as well as a
surge in shipping demand. This brought about an impressively large
balance of payments surplus, and by the inflow of specie and foreign
currency, Japan was able to emerge as a creditor nation once and
for all. Of course, these changes were accompanied by such social
problems as inflation and declining real wages.

A post-war recession, the "Kanto" earthquake, and a financial
crisis marked the relatively stagnant 1920s. The rural economy was
hit hardest by the collapse in raw silk and rice prices, and the
depression was widespread in shipbuilding and coal mining. The gov-
ernment and "Zaibatsu" banks responded to the depression and to
the great earthquake of 1923 with credit expansion. Restrictive
policy resumed at the time of the British return to the gold stan-
dard in 1925, however, resulting in the banking crisis of 1927. The

lift of the gold embargo in 1930 was also badly timed — during 1930, exports of silk and cotton goods fell by half, while those of other manufactures equally dwindled.

However, thanks to rationalization efforts by business firms, industrial production kept growing steadily, if slowly. Textiles still played the major role. Silk production was carried out increasingly in factories, and cotton spinning factories were expanded in scale and then merged, leading to the creation of an oligopolistic structure. It was in this period that large-scale integrated spinning-weaving factories appeared.[2]

As Table 2 shows, heavy industries like iron and steel, nonferrous metals, and machinery grew rapidly during MEG2. But it was in the 1930s rather than the 1920s that the share of these industries and of chemicals increased sharply. These indexes seem to refute the traditional explanation (e.g., Nakamura 1978) that monopoly capitalism with heavy and chemical industries took root in the 1920s. More illuminating is the hypothesis that the more rapid growth of domestic heavy and chemical industries in the 1930s was made possible by an early recovery from the world-wide Great Depression and by high protective barriers (Nakura 1983; Hashimoto 1982). It is undeniable, however, that the favorable atmosphere abroad during the WWI period stimulated the development of heavy and chemical industries, and that the recession of the 1920s facilitated the monopolization of the heavy and chemical sector, thus serving as a basis for further growth in the 1930s.

Rapid industrialization that concentrated on a few sectors naturally led to a gap between them and traditional sectors. The dual nature of the Japanese economy, either within the manufacturing industries or of the economy as a whole, can be traced back to the beginning of MEG (Ohkawa and Rosovsky 1978; Shibagaki 1990; Nakamura 1989). More on this will be discussed in the next section.

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[2] The table below shows a substantial increase in the share of factory production in total manufacturing output during the MEG period (Ohkawa and Rosovsky 1973, p. 81).

TABLE N1

(Unit: %)

year	1890	1895	1900	1905	1909	1914	1919	1925	1931	1937	1940
Factory Output in Total Manufacturing Output	31.5	41.2	46.6	47.2	46.2	52.6	60.6	65.2	73.2	74.2	83.1

III. Japanese Pattern in International Perspective

As the opening sentences of this paper suggest, the "Industrial Revolution" or the initial stage of MEG, can be defined and interpreted in terms of structural change — in other words, a reallocation of the means of production, labor and capital from agriculture to manufacturing sectors. In examining 19th century European countries, Kuznets (1971) sought the common characteristics of MEG, and emphasized economy-wide productivity increases due to this resource reallocation. A further development in this line of research came from Chenery and Syrquin (1975) who performed a massive statistical excercise from which they produced a stylized description of "normal" variation in economic structure in terms of per capita income levels in the post–World War II period. They investigated not only the share of labor force and of income generated by industry sectors, but also the breakdown of total expenditure by consumption, investment, government outlays and the foreign sector, as well as birth rates, death rates, and school enrollment. Crafts' work on the British Industrial Revolution (1984, 1985) is a pioneering example that compares the British experience with these "normal" variations to characterize Britain's industrialization pattern. The objective of this section is to place the Japanese MEG process in the context of other countries' experiences in economic development, and to single out the peculiarities of the Japanese pattern. It is hoped that the results will provide another empirical basis to test existing hypotheses regarding Japanese industrialization.

Table 4 presents a useful guideline in examining the structural changes that occur during economic development. Panel (a) shows "average" characteristics according to the per capita income level in 17 European countries in the 19th century, while panel (b) summarizes those for 101 countries at different development phases during the 1950–70 period. The estimates were produced by regression methods, and the equations used did not fit the data perfectly, although the correlation was very high.[3] It should be noticed, therefore, that a large dispersion about the "normal" pattern is observed in practice.

It is apparent from the table that "stylized" patterns of development in 19th century Europe in the transition from a per capita

[3]Simulations for countries of 10 million people.

TABLE 4

PATTERNS OF DEVELOPMENT

(Income Level in 1970 U.S. Dollar)

Forecast values at	$300	$400	$550	$700	$900
(a) 19th Century Europe					
CBR	38.8	36.5	34.0	3.20	30.0
CDR	28.9	26.4	23.7	21.6	19.5
AGLAB	72.9	64.3	54.6	47.4	39.8
AGY	54.2	46.5	38.0	31.6	24.9
MANY	18.1	21.3	24.8	27.5	30.3
SCHOOL	0.174	0.262	0.360	0.435	0.512
INVT	10.5	12.2	14.2	15.7	17.2
CONSN	83.4	81.5	79.4	77.9	76.2
INFL	0.9	0.5	0.1	−0.1	−0.4
GOVT	8.0	7.5	7.0	6.7	6.3
(b) 1950-70 World					
CBR	44.8	42.5	38.8	35.8	32.6
CDR	19.0	17.0	14.1	12.5	10.9
AGLAB	66.7	62.7	57.3	52.4	46.6
AGY	46.3	41.3	34.6	29.7	24.9
MANY	14.5	17.0	20.5	23.3	26.2
SCHOOL	0.354	0.429	0.522	0.592	0.663
INVT	15.4	16.7	18.3	19.5	20.8
CONSN	73.0	70.9	69.1	67.7	66.1
INFL	2.4	2.1	1.7	1.4	1.1
GOVT	13.4	13.6	13.5	13.4	13.5

Source: Crafts (1984, p. 444).

Note: Variables are defined as follows: CBR is the crude birth rate, births per 1000 population. CDR is the crude death rate, deaths per 1000 population. AGLAB is the percentage of the labor force in agriculture and extractive industry. AGY is income originating in agriculture and extractive industry as a percentage of national product in current prices. MANY is income originating in manufacturing and construcion as a percentage of national product in current prices. SCHOOL is the fraction of the population aged 5–19 enrolled in primary or secondary schools. INVT is the percentage of gross national expenditure devoted to gross investment including stocks in current prices. CONSN is the percentage of gross national expenditure devoted to private consumption in current prices. INFL is the deficit on current account of the balance of payments as a percentage of gross national product in current prices. GOVT is the percentage of gross national expenditure devoted to government expenditure of current goods and services in current prices.

income of $300 (in 1970 constant prices) to $900 contrast sharply
to the experiences of those countries that recorded similar income
levels during 1950–70. Though both cases show declining death
rates with rising income throughout the transition period, the
1950–70 experience records much lower death rates. In other
words, the degree to which population pressure limited economic
growth was relatively low in 19th century Europe. And not surpri-
singly, the rate of physical and human capital formation (investment
rate and school enrollment) was higher in 20th century developing
countries than in 19th century Europe. It is also noteworthy that a
current account surplus had already been attained by the time of a
per capita income of $700 in the case of European countries, re-
flecting the different conditions prevailng in the international eco-
nomy and capital market for the 19th century European countries
and for those countries entering MEG in the 20th century.

Another important contrast lies in the sectoral allocation of
labor, and particularly, in the relative labor productivities by sec-
tor. In both cases, the share of income originating in the primary
sector declines, and that from the secondary sector increases, but
19th century countries at all income levels had a higher proportion
of income originating in both primary and secondary sectors. At
income levels above $400, however, 19th century Europe had a
smaller share of the labor force in the primary sector. In other
words, the "sectoral productivity gap" between the primary sector
and other sectors was much greater, and has widened continually,
for 20th century developing countries, as evidenced in Table 8. Ex-
plaining this phenomenon, as will be later discussed, should be a
priority on the agenda for future research.

Now, we examine the Japanese experience in comparison to these
stylized facts. First of all, a per capita GNP series in the early
MEG stage needs to be developed in terms of 1970 constant dollars.
On the basis of growth rate indexes implied by LTES (for
1885–1940 and 1952–70, estimates of per capita real income growth
are available; for the intervening period, rates were computed from
1930–70 series of total income in current prices, population growth
rates, and GNP deflator), the following two versions were obtained
(Table 5).

Series I: The pioneering study by Kuznets (1971, p. 24) showed
the way to project backwards by the growth rate of per capita GNP
in 1965 back to that of the 19th century, leading to $136 in 1965
constant prices for 1886 (Minami 1981, p. 13), and $172 for 1887

TABLE 5

PER CAPITA GNP OF JAPAN, 1885-1940 IN 1970 CONSTANT DOLLARS

Year	I	II	Year	I	II	Year	I	II
1885	—	474	1904	416	719	1923	529	914
1886	—	501	1905	394	681	1924	539	931
1887	306	529	1906	389	672	1925	562	971
1888	310	535	1907	399	690	1926	557	962
1889	325	562	1908	406	701	1927	567	979
1890	313	540	1909	410	708	1928	595	1,027
1891	341	590	1910	431	744	1929	589	1,018
1892	333	575	1911	430	742	1930	586	1,013
1893	352	608	1912	424	732	1931	580	1,001
1894	361	623	1913	422	728	1932	597	1,030
1895	379	655	1914	419	723	1933	647	1,117
1896	374	645	1915	437	755	1934	694	1,199
1897	365	630	1916	467	807	1935	722	1,247
1898	373	645	1917	497	859	1936	729	1,258
1899	395	683	1918	544	939	1937	769	1,328
1900	385	665	1919	568	980	1938	794	1,372
1901	394	681	1920	556 ·	961	1939	837 ·	1,446
1902	383	661	1921	584	1,008	1940	865	1,493
1903	379	655	1922	561	969			

Source : See Text.

(Ohkawa 1979, p. 7). Conversion to dollar terms using exchange rates, however, involves a substantial bias in international income comparisons. This being adjusted to Purchasing Power Parity rate, per capita income in 1887 becomes $251.[4] This is equivalent to $306 in 1970 constant dollars, although this figure is still an underestimate, since the extent to which exchange rate conversion falls short of the purchasing power parity conversion tends to be greater for the 19th century. Series I is the result of forward extrapolation from the base year figure of $306 in 1887, and is regarded as the closest to the figures traditionally agreed upon (though with large variations).

Series II: Kravis *et al.* (1978) have computed real income per capita for 1970 for more than 100 countries in terms of 1970 constant dollars reflecting purchasing power parity.[5] Taking the

[4]The multiplication factor for the Japanese figure is 1.31 or 1.63, according to the choice of the base year. The adjustment ratio was set to 1.46 using the Fisher index method. See Ohkawa (1979).

[5]Numerous works exist with 1980 constant prices. For example, Maddison (1989) computed Japanese historical incomes in 1980 constant international dollars: $677 for 1910,

Japanese per capita income of $2,836, series II was obtained by backward extrapolation.

The two series, presented in Table 5, diverge by approximately 70 percent. Although series II may be nearer to the reality since figures in series I tend to understate the incomes as mentioned above, the below analysis will be carried out on both.

At first glance, one has to wonder about the traditional description that Japan started from an almost subsistence income and carried out MEG at ultra-high speed (Ohkawa and Rosovsky 1973; Minami 1981). The figures for the early years in Table 5 exceed those levels indicated by the recent discussion on the standard of living immediately after the Restoration (Hanley 1983; Yasuba 1984).[6] This is not to deny that the growth rate was unprecedented. It took Japan only about 15 years (series I), in sharp contrast to the almost 80 years for Britain, to boost per capita income from $400 to $550.

Details of Japanese development patterns are found in the Appendix. Characteristic features at per capita income levels of $300, $400, $550, $700, and $900 are outlined in Table 6, enabling us to compare them to other countries at the same levels of income. Table 6 might be better understood when seen with Table 4.

Some of the peculiarities of the Japanese experience as seen in Table 6 are well known. Traditional thriftiness and a high saving rate, high levels and growth rates of physical and human capital formation, exceeding those of 20th century entrants to MEG, not to mention 19th century Eruope, are clearly manifested. Also shown is the rapid increase in the share of income originating in manufacturing and mining. Otherwise, the share of the government outlay in total national expenditure was similar to that in 19th century Europe, except during the war years. A current account surplus was

$795 for 1913, $1,162 for 1929, $1,116 for 1950. These are equivalent to $331.9, $389.7, $569.6 and $547.1, respectively, in 1970 constant prices. These figures are somewhat doubtful because he overestimated the growth rates for the 1910–29 period, and he took the growth during 1929–50 to be negative. The analysis of the patterns of development have also been extended to the 1950–83 period. See Syrquin and Chenery (1989).

[6]Yasuba's (1986, p. 221) statement that "British per capita GDP was still nearly three times as high as Japanese," may be correct, but for the reason that he quoted underestimated figures for both Britain and Japan. For Britain, see Crafts (1983a); for Japan, see text. Also, to the most recent income estimates of 19th century European countries (Crafts 1983b), series II conforms better, as well as to descriptive sources, and to the evidence of high growth rates during the Tokugawa era.

TABLE 6

PATTERNS OF DEVELOPMENT IN JAPANESE INDUSTRIALIZATION (Income Level in 1970 U.S. Dollars)

Year	(a) series I					(b) series II		
	1887 ($306)	1908 ($399)	1920 ($556)	1934 ($694)	1940 ($865)	1890 ($541)	1908 ($701)	1917 ($859)
CBR	27.3	34.7	36.2	29.9	29.4	28.7	34.7	33.5
CDR	1.95	21.5	25.4	18.1	16.5	20.6	21.5	22.2
Urbanization (%)*	—	16.9	18.0	32.7	38.3	—	16.9	18.0
Percentage of Male Labor Force in Agriculture	—	55.5	51.5	40.9	38.3	61.0	55.5	52.6
Percentage of Male Labor Force in Industry	—	17.6	22.3.	23.3	29.9	—	17.6	19.9
AGLAB	—	59.5	56.5	48.1	45.9	65.0	59.5	57.3
AGY	39.1	33.5	26.2	13.9	15.7	45.0	33.5	23.9
MANY	11.8	15.8	20.2	25.4	36.0	10.2	15.8	24.9
SCHOOL*	28.1	43.2	56.8	57.5	57.0	27.7	43.2	56.8
INVT	12.2	17.6	22.6	17.2	31.7	14.5	17.6	21.1
CONSN	81.2	76.6	71.3	71.3	55.1	82.3	76.6	63.0
GOVT	7.6	8.2	6.8	11.8	13.1	6.3	8.2	4.9
INFL	—							
(Japan)	0.86	1.67	0.37	−0.08	0.11	0.65	1.67	−11.36
(Empire)	—	1.78	0.62	−0.01	2.36	—	1.78	−11.53
Percentage of Manufactures in Export	66.5	80.4	86.0	89.7	90.8	66.8	80.4	86.1

Source: See the source of Table A1 in the Appendix.

Note: 1.*: Selected from nearest 5-yearly data.

  2. — : not available.

TABLE 7
POPULATION TRENDS OF THE SUWA DISTRICT

	1690~1700	1700~50	1750~1800	1800~50	1850~70
Birth Rate	33.1	26.9	23.3	23.1	22.0
Death Rate	24.5	23.8	20.6	21.2	18.4

Source : Hayami (1973), Nakamura (1983, p. 46).

attained as late as 1930 (income level of $1,000 by series II), except for a short spell during WWI, although the share of manufactured products in exports was quite high, indicating that Japan enjoyed an advantage in overseas trade despite its late start. That is, while the Japanese exported raw materials to advanced countries and in turn imported finished products and capital goods, they sold manufactured items in return for primary products to their peripheries, thus retaining their "intermediate" position (Shibagaki 1990).

Demographic behavior in Japan's early MEG seems to resemble the behavior of 19th century Europe more than that of 1950–70 developers. Looking at birth rates and death rates, Japanese records conform to the Western European pattern, which experienced a demographic transition from high–birth high–death to low–birth low–death regimes in the early MEG. However, Japanese population growth was largely due to a rise in birth rates in the early period of MEG, and a decline in death rates later, as evidenced by population trends during the Tokugawa era (see Table 7). Fertility rises up to about 1920 and the decline in birth rates and death rates afterwards have been examined (e.g., Ohbuchi 1976), although not yet adequately, given a lack of resources. This problem will be overcome hopefully and will constitute a useful research project.[7]

The most idiosyncratic aspect of the Japanese development pattern is the structure of production and sectoral productivity. Above all, the share of income originating in agriculture and mining was much lower in Japan than the 19th century European norm throughout the transition, while the share of the labor force in the primary sector was about the same level. As a result, Japanese labor productivity in the primary sector was quite low relatively, which is clarified in Table 8. In the case of 19th century Europe, the sectoral productivity gap diminished continually, with the gap disappearing very rapidly in the extreme case of Britain. In contrast, Japanese

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[7]Research reflecting recent developments in the techniques of historical demography must continue.

TABLE 8
SECTORAL PRODUCTIVITY GAP (Non-primary Sector/Primary Sector)

Forecast values at	$300	$400	$550	$700	$900
Britain	2.23	1.64	1.01	—	1.08
19th Century Europe	2.27	2.07	1.96	1.95	1.99
1950–70 World	2.32	2.39	2.54	2.61	2.63
Japan I	2.27	2.92	3.66	5.74	4.56
Japan II	—	—	2.27	2.92	4.27

Source: Computed from Crafts (1984) and Appendix.

sectoral productivity gaps have been even higher than those of countries entering MEG during 1950–70, and the gaps grew over the course of development.

It has been recognized by many researchers that the problem of surplus population in rural areas was aggravated by the lack of labor migration from the low productivity agricultural sector to other sectors despite this large productivity gap. It may be understandable that countries with high population density such as Japan had to suffer a long-run sectoral labor productivity gap to a certain extent. Still, the gap was large throughout the period in question, and is becoming ever larger.

The Lewis type dual economy model (Lewis 1954) renders a sanguinary explanation of the gap, that the rural surplus population kept the wage level in the industrial sector below labor productivity, the rate of return on capital in the industry higher *pari passu,* thus promoting investment and growth in the modernized sector. If this approach is to be of some practical value, then the "turning point" at which the dual structure dissolved was probably not around 1918, as argued by Ranis and Fei (1964), but some time after WWII (Ohkawa and Rosovsky 1973; Minami 1968). Labor market institutions such as life-time employment and seniority wage setting in the industry sector were pointed out to have exacerbated the dual structure, by immobilizing the surplus labor in the primary sector. Here, it is worthwhile to reconsider the factual relevance of the role played by the "concurrent growth" of agriculture and industry in early Japanese MEG (Ohkawa 1972, pp. 166–7). Furthermore, the proposition that tried to play down the importance of Japanese peculiarities by averring the absence of differences between Japanese and British industrialization patterns (Minami 1981) is to be reexamined.

Ohkawa and others stressed "rapid" structural change during Japanese industrialization, referring to the rate at which change occurred. But it is suggested that the measuring rod of structural change be the extent to which the sectoral productivity gap has narrowed rather than the time dimension. These authors indeed discussed the process of productivity gap increases, but unfortunately without realizing the implications when mentioning dualistic distortions (LTES Vol. 1, pp. 46, 56).

If the early MEG period Britain was characterized by low growth rates and rapid structural change (resource reallocation toward the industry sector), and Japanese development is characterized by high growth rates and slow structural change, the two being located at the polar extremes of MEG patterns among the countries examined.[8]

And if the poor standards of living among lower classes, especially those of urban laborers during the British Industrial Revolution, were due to the low increases in income and productivity and to rapid structural change (labor reallocation and urbanization), the demise of the rural areas during Japanese industrialization can be attributed to laggard structural change in spite of the very high rate of growth.

A two-pronged research agenda reveals itself now. One prong calls for the investigation of not only economic factors like labor market conditions, but diverse social, political and cultural factors that might have influenced the relatively slow structural change. The other is the evaluation of the historical consequences of these development patterns.

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[8]Labor productivity was highest in the tertiary sector during the early MEG, after which it fell drastically (LTES Vol. 1, pp. 45, 60). This fact reinforces the argument in the text.

Appendix

TABLE A1
PATTERNS OF DEVELOPMENT IN JAPANESE INDUSTRIALIZATION

Year	1885	1887	1890	1895	1900	1905	1908	1910	1915	1917	1920	1925	1930	1934	1935	1940
Series I	$474	($306)	$312	$379	$385	$394	($399)	$431	$437	$497	($556)	$562	$586	($694)	$721	($865)
Series II	—	$529	($541)	$655	$681	$681	($701)	$744	$755	($859)	$961	$971	$1013	$1199	$1247	$1494
CBR	26.7	27.3	28.7	32.4	31.2	31.2	34.7	34.8	34.1	33.5	36.2	34.9	32.4	29.9	31.6	29.4
CDR	23.1	19.5	20.6	20.5	20.8	21.6	21.5	21.6	20.7	22.2	25.4	20.3	18.2	18.1	16.8	16.5
Urbanization (%)	—	—	—	12.2	14.6	16.7	16.9	16.9	19.1	18.0	18.0	21.6	24.0	32.7	32.7	38.3
Percentage of Male Labor Force in Agriculture	—	—	61.0	59.4	58.3	56.0	55.5	55.0	52.8	52.6	51.5	40.4	45.1	40.9	40.0	38.3
Percentage of Male Labor Force in Industry	—	—	—	—	—	16.9	17.6	17.7	19.8	19.9	22.3	23.6	23.2	23.3	23.7	29.9
AGLAB	—	—	65.0	63.1	61.8	60.1	59.5	59.3	57.6	57.3	56.5	53.3	50.9	48.1	47.3	45.9
AGY	42.2	39.1	45.0	39.5	36.0	29.2	33.5	28.6	24.7	23.9	26.2	25.1	14.6	13.9	14.8	15.7
MANY	10.1	11.8	10.2	12.6	14.3	14.9	15.8	18.2	21.3	24.9	20.2	18.6	22.3	25.4	26.5	36.0
SCHOOL	28.1	28.1	27.7	33.5	43.2	50.9	43.2	53.8	51.9	56.5	56.8	55.2	57.5	57.5	57.5	57.0
INVT	12.0	12.2	14.5	16.2	16.2	16.8	17.6	17.6	15.9	21.1	22.6	16.6	15.8	17.2	18.3	31.7
CONSN	80.9	81.2	82.3	74.7	79.3	73.9	76.6	75.6	72.5	63.0	71.3	78.3	74.0	71.3	69.2	55.1
GOVT	7.4	7.6	6.3	9.5	7.6	20.3	8.2	8.6	7.3	4.9	6.8	6.6	9.9	11.8	11.6	13.1
INFL (Japan)	0.07	0.86	0.65	-2.03	0.83	4.79	1.67	1.09	-2.70	-11.36	0.37	1.98	-0.29	-0.08	-1.30	0.11
INFL (Empire)	—	—	—	-0.45	0.92	4.82	1.78	0.58	-2.80	-11.53	0.62	1.64	0.21	-0.01	-0.89	2.36
Percentage of Manufactures in Export	59.9	66.5	66.8	75.7	74.9	82.2	80.4	82.2	83.2	86.1	86.0	84.3	87.1	89.7	89.5	90.8

Source: 1. *Historical Statistics of Japan* (1987, Vol. 1, pp. 154, 204-5; Vol. 5, pp. 212-3, 242-7).
2. LTES Vol. 1 (1974, pp. 178, 202-5); LTES Vol. 2 (1979, pp. 198-201, 208-17, 226-9, 242-3); LTES Vol. 14 (1988, pp. 176-9).

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