LABOR'S RELATIVE SHARE IN THE JAPANESE
MANUFACTURING INDUSTRY SINCE 1900*

By Mataji Umemura

Assis. Professor, The Institute of Economic Research

I. *Introduction*

This paper deals with the distribution of income in the Japanese manufacturing industry with special reference to its long-run changes. We carry out the analysis throughout in terms of labor's relative share, which in its essence is equivalent to the concept of the rate of surplus value or the rate of exploitation in Marxian economics. It is only a matter of preference whether we adopt the concept of labor's relative share or that of the rate of surplus value.[1]

In this field, we have already the eminent empirical studies of M. Kalecki, J. T. Dunlop, E. H. Phelps Brown and M. Shinohara.[2] Through their efforts, we have a fairly accurate knowledge of its short-run changes, but as far as its long-run changes are concerned we are still uncertain. D. Ricardo and K. Marx tried to make heroic speculations about the long-run tendency of labor's relative share by using rather crude tools, but we can find no distinct tendency of the relative share moving upward or downward through the use of existing statistcis.[3] The factors affecting and the mechanism determining its long-run changes are so many and so complicated that Kalecki says "No *a priori* statement is therefore possible as to the long-run trend of the relative share of wages in income."[4] Therefore, the accumulation of observations about the long-run changes of the distribu-

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[1] The numerical expression of the relationship of labor's relative share to the rate of surplus value can be shown as follows:

$$r=\frac{1}{1+s} \quad \text{or} \quad s=\frac{1-r}{r}$$

where r and s stand for labor's relative share and the rate of surplus value respectively. From the above equation, it is clear that they always move in opposite directions. See also J. Robinson, *An Essay on Marxian Economics*, 1949.

[2] M. Kalecki, *Essays in the Theory of Economic Fluctuation*, 1939, Chap. 1 and *Theory of Economic Dynamics*, 1954, Part 1. J. T. Dunlop, *Wage Determination under Trade Unions*, 1950, Chap. 8. E. H. Phelps Brown and P. E. Hart, "The Share of Wages in National Income," *Economic Journal*, June 1952, pp. 253–277. M. Shinohara, "Kogyo ni okeru Bunpairitsu" (Labor's Relative Share in Manufacturing Industry), *Shotoku Bunpai to Chingin Kozo (Income Distribution and Wage Structure)*, 1954, pp. 36–71.

[3] D. Ricardo, *On the Principles of Political Economy and Taxation, The Works and Correspondence of David Ricardo*, Volume 1, ed. by P. Sraffa and M. H. Dobb, 1953.
K. Marx, *Das Kapital*, ed. by M. E. L. Institute, 1932-34.

[4] M. Kalecki, *Theory of Economic Dynamics*, p. 31.

tion of income is badly needed.   This paper hopes to make some contributions to this field.

The Japanese economy started from the primitive stage of economic development at the early Meiji era, and then carried through a highly remarkable industrialization, which has been characterised by the surprising growth of the national products and remarkable changes of her industrial structure.   According to the available estimates, during the periold of 1878–1942 the growth rates of total and per capita real national income were 3–4 per cent and 2–2.5 respectively and the proportion of the net output of primary industry to the total national income steadily declined from 65 per cent to 17 per cent.[5]

Using the terms of Harrod's fundamental equation of economic growth $Gc=s$, the high value of growth rate of the Japanese economy can be attributed to the low value of the capital coefficient and/or the high value of the savings ratio.   The available estimates of these, though they are only tentative in their nature, show us that the values of the capital coefficient and of the savings ratio of the Japanese economy appear to be higher than those of U. S. A. and U. K.[6]

Therefore, the next problem to be discussed is how the Japanese economy realise its high savings ratio in spite of the relatively low level of income.   We will discuss briefly some important factors stimulating savings below.   The foreign bond issue raised in London during the 1870's amounted to 16.5 million yen, which is estimated to be about 3 per cent of national income at that period.   In addition to this, the 364 million yen worth of reparations received from China was roughly equal to one and half year's national income at that period.   It can not be denied that they made great contributions to the economic development of Japan.

The opinion that the propensity to save of the Japanese throughout all the social classes is peculiarly high, has been cogently insisted upon by many economists.[7]   In this regard, the mental attitude of the Japanese to praise very much the virtue of thrift which prevailed and still prevails cannot be neglected.   And it is also well recognized that the heavy land tax was the most important source of Government investment which paved the way towards economic development.[8]   This must be appraised as remarkable characteristics of the Japanese economy, compared to the present situations of the South-east Asian countries which suffer from the lack of stable sources of revenue.   Furthermore, we must mention the secular inflationary tendency in Japan, which seemed to be favorable to savings through the   redistribution of income.   During the period of 1878–1913, the price level rose approximately by 80 per cent, compared to the steady or declining tendency of the price level in the Western countries.[9]

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[5] K. Ohkawa and Associates, *The Growth Rate of the Japanese Economy since 1878*, 1957, Part I, Chap. 2.
[6] Ohkawa, *ibid.*, Part III, Chap. 2.
[7] C. Clark, *The Conditions of Economic Progress*, 2nd Ed., 1951, p. 526.
[8] B. F. Johnston, "Agricultural Productivity and Economic Development in Japan," *Journal of Political Economy*, Dec. 1951.
[9] Ohkawa, *ibid.*, Part II, Chap. 4.

However, it may be reasonable to attribute the high rate of savings to the large share of profit in national income, because profit itself is the main-spring of the internal accumulation of capitalistic enterprise. The focus of this paper is directed to this point.

However, in spite of our original intention, we deal with the labor's relative share in the manufacturing industry instead of the distribution of income in the national economy as a whole. The reasons of this procedure are of two kinds. One is the world wide empirical fact that the manufacturing industry is always ahead of the remaining parts of the economy by playing its role as a prime mover of economic development, and is considered to be the representative of the capitalistic sector of the economy. Another reason is rather complicated, and we will leave the discussion of it to the next section.

II. Some Problems in the Application of the Concept of Labor's Relative Share

It is well recognized that the economic theory generally presupposes a pure capitalistic economy as its object of analysis but this presupposition can not be expected to be always valid in the real world. Of course, this does not mean that the usefullness of the economic theory might be reduced by this inevitable limitation. On the contrary, thanks to this simplifying assumption the economic theory serves as a useful tool of our reasoning. However, when we intend to apply the economic theory to any real situation, we are obliged to modify or sometimes reformulate the theory by using alternative assumptions. The concept of labor's relative share is not an exception to this general rule.

In a pure capitalistic economy such as described in the text of economics, the entrepreneur and the laborer are the two distinct social classes and they are not competing with each other. Therefore, the profit and the wage are also the two distinct categories of social income. The actual situation in highly developed countries such as U. K. and U. S. A. may be regarded as approximating the preconditions of theory. But in the semi-developed countries such as Japan, in which the non-capitalistic sector of the economy still remains important even at the present day, it is far from the real fact.

For instance, in Japan, according to the labor force statistics, the proportion of salaried employees and wage earners to the total labor force is only about 40 per cent, compared to higher figures ranging from 70 to 90 per cent in West Germany, Canada, U.S.A. and U.K. The remaining part of the labor force consists of working proprietors and unpaid family workers, whose income is a mixture of wages, property income and profit, and can be called a mixed income. Therefore, in order to estimate the labor's relative share, the imputation of their wage bill under some reasonable assumption is inevitable.

In this connection, C. Clark's method of segregating their mixed income

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[10] C. Clark, *The Conditions of Economic Progress*, 2nd Ed., 1951, pp. 521–526.

seems to be suggestive indeed.[10]   He assumed that the working proprietor and
the unpaid family worker are fully competitive with the salaried employees and
wage earners in the labor market.   He believed that the competition is so
effective that there is no room to allow for any wage differentials among
workers of equal quality.   Under this assumption, the working proprietor and
the unpaid family worker should earn exactly the same wage as the salaried
employees and the wage earners after considering the sex and age elements
which are regarded as main factors affecting the quality of labor.   From these
reasoning, Clark proceeded to compare the average wages and salaries of the
employed workers with the average net output per head of total gainfully
occupied after giving an adequate adjustment for the sex and age composition
of them.

     However, the application of Clark's method to the Japanese economy requires
a further consideration, because of the wide wage differentials which prevail through-
out among the workers of the same sex and age groups.[11]   This consideration
makes analysis too complicated to be managed.   Therefore, we decided finally
to abondon the analysis of labor's relative share in the national economy as a
whole and concentrate our attention to that of the manufacturing industry only.

III.   *Measurement*

     In this section, we explain our procedure of estimating labor's relative share
in manufacturing industry since 1900.   However, even in the manufacturing
there are a large number of handicraft, which are non-capitalistic in their nature
and must be excluded from our scope of analysis. · But it must be noted that the
demarcation line adopted in this paper is rather arbitrary and depends upon the
convenience of the statistical data used.

     The data utilized are those from the Census of Manufacture which has
been compiled every five years since 1909 and annually since 1920 by the Ministry
of Commerce and Industry and its successors.   The design of the Census has
been changed several times, so that the complete comparability of the data can
not be expected over the whole period of our analysis.   The Census was designed
to cover only the factories employing regularly five or more production workers
untill 1939. Since 1939, the coverage of the Census has been broadened to include
all the factories irrespective of scale.   Other establishments belonging to manu-
facturing industry, such as head offices, branch offices, etc. are out of the Census
throughout the entire period.   This paper concerns only factories employing
five or more production workers to insure the continuity of the statistical series.
Some minor exceptions of this general rule will be mentioned later.

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[11] K. Ohkawa carried out a comprehensive theoretical analysis of the labor's relative share
in the economy having the non-capitalistic sector as its important part and found some de-
ficiency in Clark's method mentioned above.   See K. Ohkawa, "Kokumin Shotoku ni okeru
Chingin Shotoku no Chii" (The Share of Wage in National Income), cited in *Chingin Kihon
Chosa (The Analysis of Wages)*, 1956, edited by I. Nakayama, (in Japanese) pp. 80–91.

M. Shinohara estimated labor's relative share in the manufacturing industry for the period of 1929–42 on the basis of the Census of Manufacture and analyzed its changes mainly from the short-run point of view.[12] We used his estimate with a minor modification, as far as it exists. His estimate of the total wage and salary bill does not include the payment for the indirect manual laborer, which is estimated to be 2.7–4.9 per cent of the total wage bill of the production worker.[13] At this point, our figures differ from Shinohara's.

Then, our main task at present is to estimate the pre-1928 figures. The estimate of net output is available from *The Growth Rate of the Japanese Economy since 1878*, and its main defect seems to be that the estimation of the net income ratio fails to reflect adequately the possible effects of relative price changes during business cycles.[14] The procedure of estimation of the total wage and salary bill adopted in this paper is as follows:

(1) We estimate the daily wage of the production worker by sex by using the data of the Census of Manufacture and the Statistical Yearbook of the Ministry of Agriculture and Commerce.

(2) We assume that the daily wage of the indirect manual laborer is 75 per cent of that of the production worker in each sex group on the basis of scattered information.

(3) We assume the annual working days to number 317.

(4) We estimate the numbers of the production workers and the indirect manual laborers by sex from the data mentioned in (1).

(5) We can obtain the estimate of the total wage bill of the production workers and the indirect manual laborers by using the figures obtained in (1), (2), (3), and (4).

(6) As for the total salary bill of the clerical and technical staffs, we follow Shinohara's procedure completely and assume that it amounts to 20 per cent of the total wage bill of the production workers.

Some reflections as to the direction of possible errors stemming from our assumptions may be necessary. As for the estimate of net output, it seems to be under estimated in the prosperous period, especially during World War I. And as for the estimate of wages and salaries, it seems to be under estimated for the early period. Therefore, our estimate of labor's relative share is over estimated for the period during World War I and immediately thereafter, and is under estimated for the early period under survey.

Since 1950 the boundary line of the Census of Manufacturing has been shifted to the factory having four or more persons engaged. And sales value instead of gross value produced has been surveyed since 1950. So that a strict comparison between pre- and post-1950 figures is not possible.

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[12] M. Shinohara, *ibid*.
[13] The method of estimation of the wage bill of the indirect manual laborer is almost equal to that for the pre–1928 period discussed below.
[14] For details of the estimation, see *The Growth Rate of the Japanese Economy since 1878*, Part II, Chap. 2.

IV. The Long-run Changes

The figures thus far obtained are converted into per capita employed in terms of 1913 prices by using the employment data already estimated and the price index of non-agricultural products.[15]   And in order to eliminate the short-run fluctuations of the series, they are arranged in five and nine years moving averages, the latter of which is exclusively used in this paper.

From Figure 1, we can divide the whole period into three sub-periods. The first period ended around 1914, and labor's relative share showed a slightly declining tendency but was fairly stable over the whole period.   This period may be characterised by the establishment of the foundation of the Japanese capitalistic economy through the victorious conclusion of the 1894–95 War. For instance, the gold standard of the Japanese currency had been established in 1897 and many cotton spinning factories entered into operation during this period.   However, in the latter part of this period the growth rate of net products of the secondary industry recorded its minimum value of 2.9 per cent.[16]

Table 1   Labor's Relative Share, 1902–40

	5 Year Moving Average			9 Year Moving Average		
	Net Output per head	Wage & Salary per head	Labor's Relative Share	Net Output per head	Wage & Salary per head	Labor's Relative Share
	Yen in 1913 prices		%	Yen in 1913 prices		%
1902	382	118	30.9	—	—	—
03	364	116	31.9	—	—	—
04	341	113	33.1	362	114	31.5
1905	341	110	32.3	339	115	33.9
06	334	110	32.9	342	116	33.9
07	335	112	33.4	351	116	33.0
08	344	116	33.7	359	118	32.9
09	358	121	33.8	368	120	32.6
1910	377	125	33.2	374	123	32.9
11	393	128	32.6	387	126	32.6
12	407	131	32.2	397	127	32.0
13	422	132	31.3	406	126	31.0
14	424	129	30.4	416	126	30.3
1915	419	125	29.8	425	130	30.6
16	421	123	29.2	424	134	31.6
17	436	130	29.8	421	143	34.0
18	424	135	31.8	424	153	36.1
19	420	154	36.7	430	162	37.7

[15] K. Ohkawa and Associates, *ibid.* Part II, Chap. 4.
[16] K. Ohkawa and Associates, *ibid.* Part I, Chap. 2

1920	424	176	41.5	432	172	39.8
21	432	196	45.4	442	185	41.9
22	435	207	47.6	462	201	43.5
23	458	222	48.5	482	217	45.0
24	492	230	46.7	500	230	46.0
1925	526	239	45.4	519	242	46.6
26	561	251	44.7	545	255	46.8
27	581	260	44.8	575	267	46.4
28	604	279	46.2	610	273	44.8
29	627	295	47.0	638	278	43.6
1930	663	297	44.8	661	283	42.8
31	683	294	43.0	680	287	42.2
32	714	296	41.5	694	289	41.6
33	736	288	39.1	693	284	41.0
34	741	278	37.5	711	283	39.8
1935	710	271	38.2	732	275	37.6
36	712	269	37.8	741	265	35.8
37	731	264	36.1	749	264	35.2
38	736	256	34.8	749	259	34.6
39	762	252	33.1	—	—	—
1940	783	248	31.7	—	—	—

Figure 1   Labor's Relative Share, 1902–40
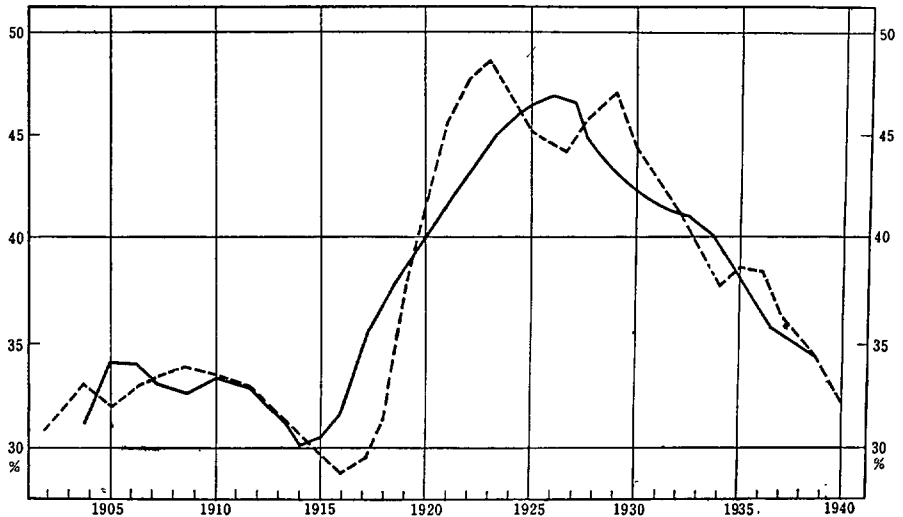
Remark: Solid Line.........9 Year Moving Average
Broken Line......5 Year Moving Average

The second period covers the following 13 years, and the labor's relative share showed a remarkably rapid increase, i.e., it increased by about 57 per cent from the low level of 30 per cent in 1914 to the high level of 47 per cent in 1926.   During the former part of this period, the Japanese economy enjoyed a never previously experienced prosperity owing to World War I and started the shift of industrial

structure from the consumer's goods industry to the producer's goods industry. After the collapse of the war boom, the Japanese economy entered into highly unstable situations. The disarmament and the Tokyo Earthquake might have some responsibility for them.

The third period was characterised by the great depression and the prolonged war economy. Labor's relative share declined sharply from the high level of 45 per cent to the same low level as that in the first period mentioned above. The significance of this marked declining tendency has been exaggerated by some economists as an important index showing the maturity of the monopolistic capitalism.

Although we fully admit the insufficiency of our estimates, it seems to be reasonable to draw the conclusion that the labor's relative share in the Japanese manufacturing industry shows a remarkably long cycle which is distinct from the business cycle.

Why does it manifest the cyclical fluctuation? What its main causes are? We will deal with these questions below. From the purely theoretical point of view, we can generally point out several factors affecting the distribution of income, among which the rate of capital accumulation, the rate of increase of labor supply, the types of technical innovation, and the degree of monopoly in both entrepreneur and labor sectors are the most important. And the mechanics through which the distribution of income is affected by them has already been made fairly clear. However, when we intend to measure the magnitude of their changes and appraise their possible effects upon the distribution of income by using statistical data, we certainly encounter the so called data bottleneck without exception. Therefore, we are obliged to restrict our analysis to the relationship between the observable variables, i.e., the volume of employment and labor's relative share in the manufacturing industry. In spite of the insufficiency of our analysis, we can get some interesting conclusions.

In Figures 2, 3, and 4, we compare the labor's relative share with the rate of

Table 2   Number of Persons Employed, 1902–40

	5 Year Moving Average		9 Year Moving Average	
	Number of Persons Employed	Rate of Employ-ment Increase	Number of Persons Employed	Rate of Employ-ment Increase
	thousand	%	thousand	%
1902	561	—	—	—
03	603	7.5	—	—
04	653	8.3	647	—
1905	690	5.7	694	7.3
06	734	6.0	734	5.8
07	783	6.7	771	5.0
08	817	4.3	820	6.4
09	855	4.5	866	5.6

1910	900	5.3	909	5.0
11	954	6.0	952	4.7
12	990	3.8	1,011	6.2
13	1,045	5.6	1,097	8.5
14	1,123	7.4	1,193	8.8
1915	1,233	9.8	1,287	7.9
16	1,372	11.3	1,371	6.5
17	1,499	9.3	1,460	6.5
18	1,611	7.5	1,544	5.8
19	1,708	7.0	1,620	4.9
1920	1,759	3.0	1,695	4.6
21	1,759	0	1,752	3.4
22	1,778	1.0	1,791	2.2
23	1,809	1.8	1,809	1.0
24	1,828	1.1	1,839	1.7
1925	1,850	1.2	1,879	2.2
26	1,893	2.3	1,886	0.4
27	1,943	2.7	1,889	0.2
28	1,950	0.3	1,906	0.9
29	1,935	— 0.8	1,939	1.7
1930	1,934	0	2,000	3.1
31	1,959	2.3	2,079	4.0
32	2,026	3.4	2,183	5.0
33	2,175	7.3	2,325	6.5
34	2,380	9.4	2,495	7.3
1935	2,646	11.1	2,771	11.1
36	2,944	11.2	3,065	10.6
37	3,336	13.2	3,352	9.4
38	3,709	11.1	3,645	8.7
39	4,038	8.8	—	—
1940	4,334	7.3	—	—

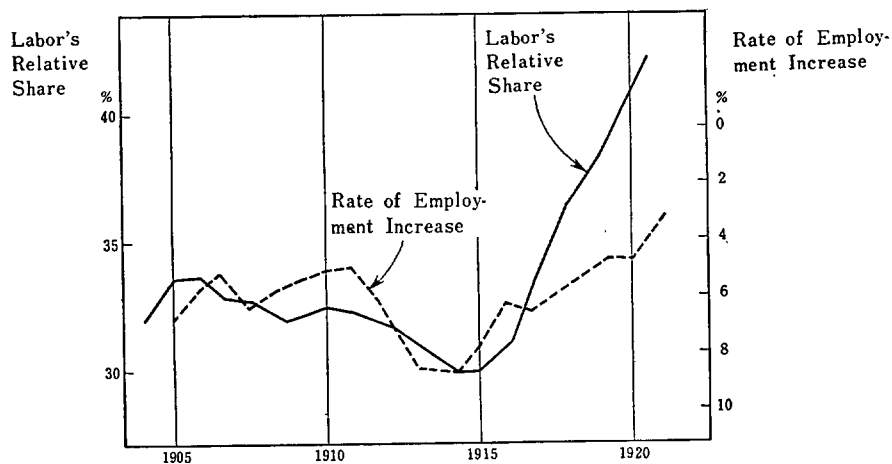Figure 2 Labor's Relative Share and Rate
of Employment Increase (1)

Figure 3   Labor's Relative Share and Rate
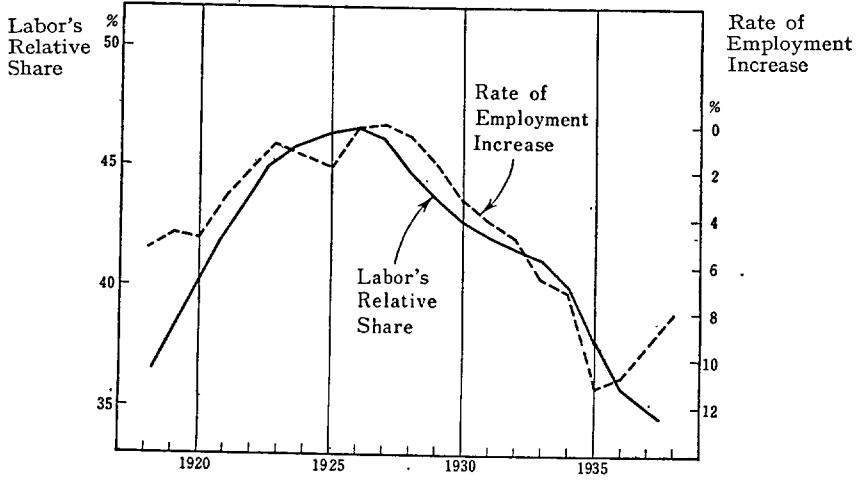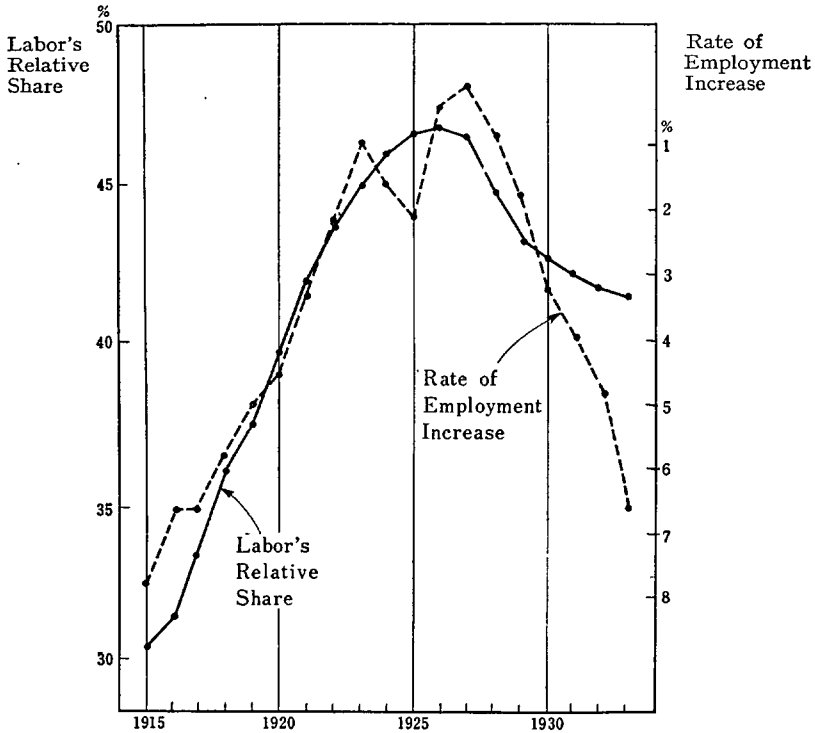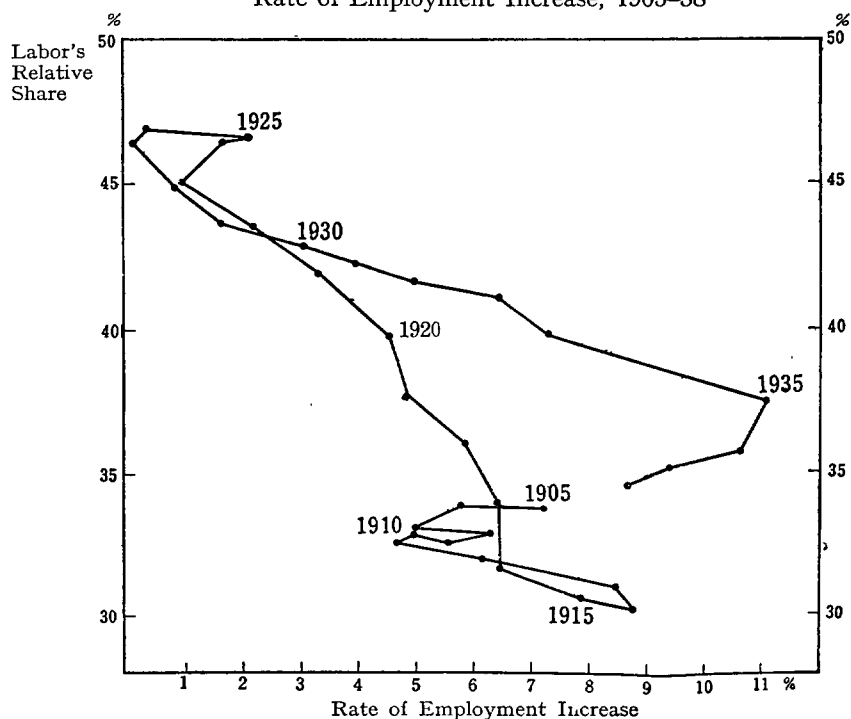of Employment Increase (2)

Figure 4   Labor's Relative Share and Rate
of Employment Increase (3)

increase of employment.   In these figures the labor's rela tive share is drawn in solid
lines, and the rate of employment increase is shown as broken lines and is scaled
inversely for the convenience of observation.   Therefore, a rise of the solid line
means a rise of the labor's relative share but a rise of the broken line means a decrease
of the rate of increase of employment, and vice versa.   It is clear that for the
years before 1916 in Figure 2, for the years of 1915–23 in Figure 4, and for the
period after 1923 in Figure 3, the labor's relative share is very closely and inversely
correlated with the rate of employment increase.   A similar inverse correlation has
already been pointed out by M. Shinohara for the period after 1929.[17]   However,
according to our findings, the inverse relationship between the labor's relative
share and the rate of employment increase existed through the whole period.

In addition to these findings, the changes of the relative position of these
two lines in these three figures suggest to us that the relationship itself changed
at least three times over the period of about 40 years.   In order to make it clear,
we draw Figure 5, the vertical and horizontal scales of which are the labor's relative
share and the rate of employment increase respectively.   Our suppositions men-
tioned above are confirmed by the S-shaped movement of the locus of coordinates
in Figure 5.   When we again divide the whole period into three sub-periods of

Figure 5   Relationship between Labor's Relative Share and
Rate of Employment Increase, 1905–38

[17] M. Shinohara, *ibid.*

1905–16, 1917–25, and 1926–35, and treat these three periods separately, we can fully explain the changes of labor's relative share during every sub-period by the changes of rate of increase of employment.   But it is also clear that we can not explain the changes of direction of the regression line in Figure 5 from one sub-period to another exclusively through the changes of the rate of employment increase.   This is to be expected because we entirely neglect the rate of capital accumulation, the types of technical innovation, the changes of industrial structure, and the changes of monopolistic powers.   It is regrettable that the data now available do not permit us to enter into further analysis of these important problems.

Here we turn our topic and enter into the observation of the changes of labor's relative share in the post World War II periods.   Strictly speaking, the post-war figures can not be directly compared to the pre–war figures because of the alteration of the method compiling the Census of Manufacture already mentioned above.   Although we tried to maintain the comparability of the series as far as possible, some discontinuity still remains unadjusted.   The data of added value and total wage and salary bill are directly available from the Census of Manufacture since 1948.   By assuming the proportion of depreciation and some miscellaneous expenses to the total sales value to be 5 and 4 per cent respectively, we can estimate the net output series comparable to the pre–war figures.   The figures thus far obtained are summarised in Table 3 below.

Table 3   Labor's Relative Share, 1948–54   (%)

1948	58.0*	1952	63.1
1949	73.0*	1953	56.5
1950	65.0	1954	54.8
1951	57.2		

Remark: The figures marked * are not comparable to the figures
since 1950. For the reason, see text.

The most remarkable characteristics of the labor's relative share in the post–war period may be its unprecedented high level, never experienced in the pre–war years.   However, in order to arrive at its normal value in the post–war period, it seems to be reasonable to exclude the figures of 1948 and 1949 from our considerations, because at that period the Japanese economy was still in the midst of inflation and is subjected to the price and distribution controls.   In addition to this, the reliability of the statistical data for these two years is somewhat questionable.   The five year average of labor's relative share from 1950 to 1954 is 59.3 per cent, compared to the highest level of 48.5 per cent in the pre–war periods (see Table 1, column 3).

We can easily point out several factors as the main causes, for instance, the remarkable growth of trade unions, the decline of monopolistic power of employers, the relative improvement of the peasants' level of living and so on.   However, we can not evaluate separately the magnitude of each of these effects upon the distribution of income owing to the lack of data.