

TWO DEPARTMENTS ANALYSIS OF PRODUCTION STRUCTURE DURING THE UPSWING OF THE BUSINESS CYCLE

By KATSUHIKO MATSUISHI*

Introduction

Crises are but the eruption of all the contradictions inherent within capitalist production and the violent solution of them. The most important contradiction of all is that of the unlimited expansion of production and the limited consumption of the masses. The theory of crises has the task of clarifying how prosperity breeds this contradiction and brings it to eruption. The wall which faces us, when we try to achieve the task from this viewpoint, is the proposition represented typically by Tougan-Baranowsky that over-production crises never occur, however miserable the consumption of the masses might be, even when it might absolutely decrease, as productive consumption (investment) is active enough to make up for the miserable level or the decrease of the consumption. If this were true, production would have nothing to do with consumption. So we had to examine this proposition first of all.

In the preceding article¹ we investigated statistically the real relation between the two major departments of social production, namely the department which produces the means of production (Department I) and the department which produces the means of consumption (Department II), especially during the upswing phase of the business cycle (See Chart 1). The conclusions which we obtained from the statistical analysis could be summarized into the following two.

(1) Department I and II develop rapidly in the same direction, closely co-relating with each other.

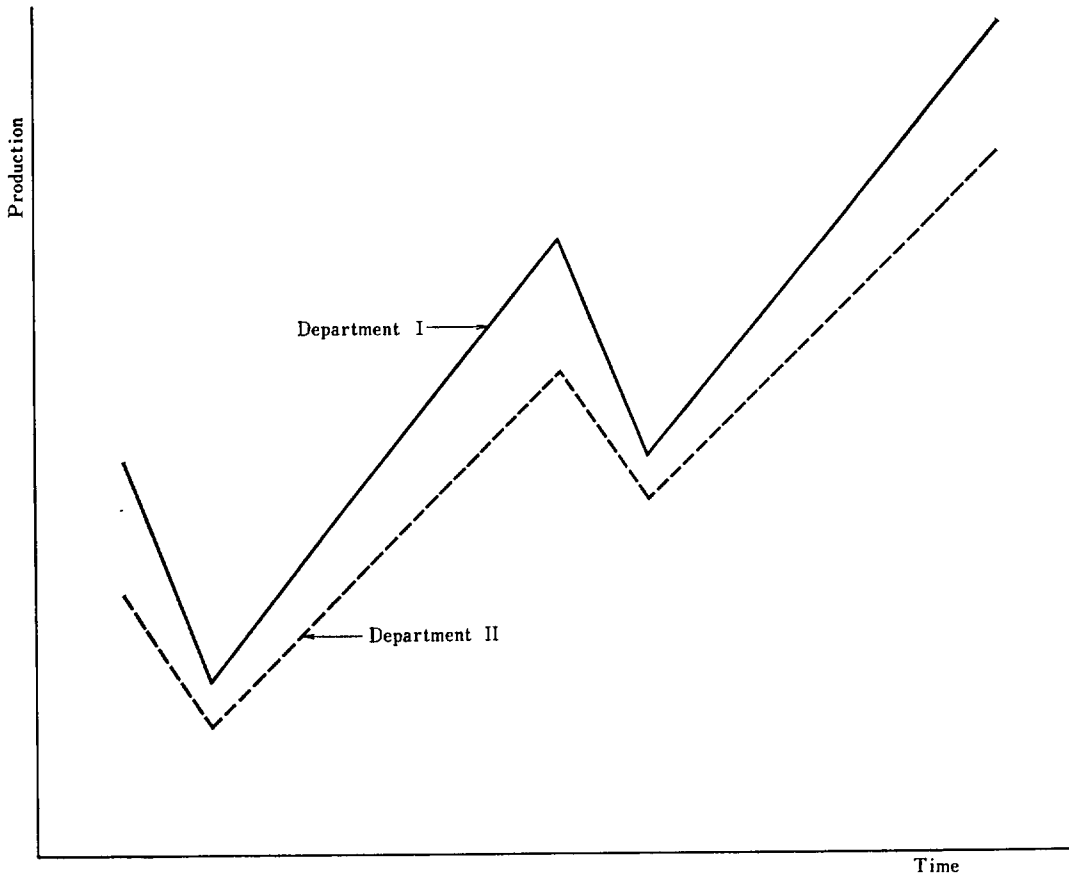
(2) Nevertheless, the tempo of development of Department I is greater than that of Department II and the *relatively* preferred, independent development of Department I can be observed.

Consequently our present task is to analyze theoretically these two elements and clarify what factors underlie these two. The section I treats the first and the section II the second.

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¹ Katsuhiko Matsuishi, "The Pattern of Development of Production-means Producing Department and Consumption-means Producing Department in the Upward Process of the Business Cycle", This *Journal*, Vol. 15, No. 2, Feb. 1971.

CHART 1. THE ACTUAL RELATION BETWEEN DEPARTMENT I AND II



I. *The Analysis of the Close Relation between the Two Major Departments*

Why do the two major departments develop in the same direction, closely depending upon each other? We could point out three factors underlying this close dependence.

1. The first factor lies in the dual nature of capitalist production. Tougan-Baranowsky tried to reinforce his proposition that production had no relation with consumption by insisting that the aim of capitalist production was not consumption or production of goods which satisfied human wants, but production itself or accumulation of capital.

“But, is not consumption the natural aim of production? Does producing not mean creating the object of consumption for human wants? We should reply that economic

systems have different types: the aim of social production in the antagonistic systems (slavery, feudalism, capitalism) is different from that in the harmonic systems (primitive and semi-communist economy, municipal economy of middle age, socialism).

In the harmonic systems, the aim of production is no doubt consumption. Such systems are characterized by the fact that the proprietors of the means of production are labourers themselves, who produce the necessary objects for their proper consumption. On the contrary, in the antagonistic systems economic enterprises are no more managed by labourers, but by other persons, the proprietors of the means of production.”²

“Here we see the paradox of capitalist economy, paradox incomprehensible for the actual political economy. It is not social consumption which directs production and constitutes its aim; it is, on the contrary, production which directs consumption and serves its aim....The aim of capitalist economy is no more human consumption, but the accumulation of capital.”³

In this way, Tougan Baranowsky cunningly cuts off the relation between production and consumption, and rationalizes his paradox which we saw in the last paper. Indeed, it is true that the aim of capitalist production is profit itself,⁴ production itself, the accumulation of capital, but does it necessarily follow from this that capitalist production has nothing to do with final consumption? The answer is negative.

This is entirely up to the understanding of capitalist production process. Needless to say, capitalist production process is the unity of the mere labour-process which produces objects of human wants necessary in any systems of society and the process of producing surplus-value. Even capitalist production should satisfy human wants. Otherwise, human society would have perished at this stage of capitalism in the long history of mankind. Capitalist enterprises have never succeeded in manufacturing profits (money form) directly in their own factories. They can make profits only via making objects which satisfy human wants directly or indirectly. Tougan Baranowsky completely ignored one necessary element involved even in capitalist production and misunderstood the other for all.

As a matter of course, objects can satisfy human wants directly taking the form of consumptive goods or indirectly taking the form of means of production. But, here it should be borne in mind that means of production are only *means* by the help of which consumptive goods are produced.

Thus, even capitalist production, of which aim is the pursuit of profit, cannot ignore consumption. It is strongly connected with consumption. Consequently, the development of Department I is always accompanied by that of Department II. Here is the first factor underlying the close relationship between the two major departments.

2. The second factor lies in the nature of the accumulation of capital. In case of Tougan Baranowsky's paradox, accumulated capital is supposed to be wholly turned into constant capital, that is, buildings, machinery, materials and tools. But, in reality, capital consists of two components, constant c and variable capital v (capital invested in employment of labourers).

$$C = c + v$$

Accumulated capital also should divide itself into additional constant capital and additional

² Tougan-Baranowsky, *Les Crises industrielles en Angleterre*, 1913, p. 218.

³ Tougan Baranowsky, *op. cit.*, pp. 219-220.

⁴ Funny enough, profit is not mentioned by Tougan Baranowsky as the aim of capitalist production. This shows enough his insight into capitalist production.

variable capital.

$$\Delta C = \Delta c + \Delta v$$

The ratio of c to v is called the organic composition of capital. In Tougan Baranowsky's case, the ratio of Δc to Δv is regarded infinitive.

$$\frac{\Delta c}{\Delta v} = \infty$$

This supposition is entirely false. As the accumulation of capital is accelerated by competition of capital and the scale of reproduction is progressively enlarged in the upward swinging process, it is certain that the organic composition of capital is rising, and therefore the demand for labourers are not increasing in proportion to the accumulation of capital, yet the absolute number of employed labourers is no doubt increasing.

Table 1 and 2 shows clearly that employed labourers absolutely increased during the so-called 'High economic growth period' of Japan, characterized by rapid growth of accumulation of capital.

TABLE 1. ABSOLUTE INCREASE OF LABOURERS (JAPAN)
(thousand persons)

Year	1950	1955	1960	1965	
Labour force	36,309	39,908	44,009	48,294	
Employed labourers	35,575	39,154	43,691	47,629	
Labourers class	13,888	17,419	22,237	27,463	
Engaged in	Forestry and fishery	852	798	765	576
	Mining, manufacture and transportation	6,415	8,158	11,488	13,513

Source: T. Ohashi and others, "The Change of Composition of Classes during High Growth Period", *Keizai*, Jan. 1970, pp. 290-291, Table 1.

TABLE 2. REGULARLY EMPLOYED LABOURERS (JAPAN)
1965=100

Year	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Index	49.2	55.3	57.7	64.1	74.3	83.5	89.5	93.1	97.8	100	100.6	103.9	108.2	112.0

Source: Ministry of Labour of Japan.

Fredrick C. Mills' survey also tells us that employment increased at the average annual rate of 1.0 percent during prosperous years, 1922-1929.⁵

The increase of employed labourers during the prosperous period when the accumulation of capital rapidly advances driven by cut-throat competition among capitals implies that a certain percentage of accumulated capital should be allotted to the payment of wages for the increased labourers. The increase of wages invokes increased demand for consumption goods. The prices of consumption goods rise and the rate of profit in Department II rises. Then, actual accumulation of capital takes place in Department II and production of consumption

⁵ Fredrick C. Mills, *Economic Tendencies in the United States*, 1932, p. xvii.

goods is rapidly expanded.

This is the second factor underlying the follow of Department II and hence the closely related development of the two major departments.

(3) The third factor lies in the nature of the competition of capital. As everybody knows very well, the nature of capital is that it begets profit. This nature is well exposed in competition. Every individual capital pursues higher profit, maximum profit and competes fiercely with one another. If it finds one sphere of production where it is invested yield good profit no more, it easily move to another where the rate of profit has been higher. Capital is really indifferent to which branch it is invested or which commodity it produces. Its main interest is only in the rate of profit. The accumulation of capital needs a larger number of labourers, which will result in the enlarged demand for consumers goods, and consequently a higher rate of profit in Department II. Then, the competition of capital necessitates more capital to accumulate in Department II and the production of consumers goods to enlarge. This indifference of capital to the departments where it is invested or the competition of capital is the third factor underlying the closely tied-up development of Department I and II.

II. *Analysis of Tougan Baranowsky's Paradoxical Reproduction Scheme*

In the previous section we analyzed what factors could explain the co-related development of the two major departments, why both Department I and II developed rapidly in the same direction, though the latter was a little delayed. One question will naturally be raised; Why, then, does the Tougan Baranowsky's paradoxical reproduction scheme tell another story? Now, we have to analyze his scheme thoroughly.

Table 3 shows his paradox that solely Department I develop very rapidly, 22 percent from the 1st year to the 2nd and 30 percent from the 2nd to the 3rd, while Department II shrinks absolutely, -9 percent from the 1st year to the 2nd and -2 percent from the 2nd to the 3rd, and Department III stagnates at the constant level every year. Why do not Department II and III develop hand-by-hand in the same quadrants as Department I? The answer is easy. It is because Tougan Baranowsky presupposed the absolute decrease of labourers' consumption. Under this presupposition Department II are obliged to shrink in response to the decrease of labourers' consumption, if the equilibrium between departments is to be maintained. Then, how is this possible? The answer is hidden in the Ratios on Table 3. The advance of Department I, the shrinkage of Department II and the stagnation of Department III are only the result of changes in the various Ratios; the composition of capital, the rate of surplus-value and the rate of accumulation. These three ratios are used as adjusting strategical factors for the very unrealistic premise of decreasing consumption of labourers. They are arbitrarily raised so much as to maintain the balances between departments. Now we go far into details.

1. *The organic composition of capital.* According to the Table 3, the organic composition of capital is raised from 300 percent in the first year to 400 percent in the second, and then to 533 percent in the third. As the absolute decline of labourers' consumption is presupposed, the production of the goods in question must decrease correspondingly from 680 in the first year to 621 in the second year, and then 611.3 in the third year. The inevitable

TABLE 3. TOUGAN BARANOWSKY'S PARADOXICAL REPRODUCTION SCHEME

				Ratios				
				Composition of capital	Rate of surplus-value	Rate of accumulation	Rate of growth of production	
				p/a	r/a	mc/r	—	
<i>Year 1</i>								
{	I	$1632p+$	$544a+$	$544r=2720$	300	100	25	—
	II	$408p+$	$136a+$	$136r=680$	300	100	25	—
	III	$360p+$	$120a+$	$120r=600$	300	100	25	—
Total	$2400p+$	$800a+$	$800r=4000$	300	100	25	—	
<i>Year 2</i>								
{	I	$1987.4p+$	$496.8a+$	$828.1r=3312.3$	400	167	51	+22
	II	$372.6p+$	$93.2a+$	$155.2r=621$	400	167	34	-9
	III	$360p+$	$90a+$	$150r=600$	400	167	40	0
Total	$2720p+$	$680a+$	$1133.3r=4533.3$	400	167	47	+13	
<i>Year 3</i>								
{	I	$2585.4p+$	$484.6a+$	$1239r=4309$	534	256	67	+30
	II	$366.9p+$	$68.9a+$	$175.5r=611.3$	533	255	42	-2
	III	$360p+$	$67.5a+$	$172.5r=600$	533	256	48	0
Total	$3312.3p+$	$621a+$	$1587r=5520.3$	533	256	62	+22	

Source: Tougan Baranowsky, *Theoretische Grundlagen des Marxismus*, 1905, SS. 224-225.

Note: Total of each year and Ratios are added by the present author. p stands for means of production, a wages, r profit, mc accumulation, I means of production producing department, II, consumption goods for labourers producing department and III consumption goods for capitalists.

result would be the breakdown of the balance of departments, if the other conditions remained unchanged. So, the number of labourers or a (variable capital or wage capital in the term of Tougan Baranowsky) must be decreased correspondingly from 800 in the first year to 680 in the second, and then to 621 in the third. The decrease of wage capital a has to be turned into the capital invested in employment of means of production p . Consequently the organic composition of capital $\frac{p}{a}$ will have to rise. This rise of the composition serves as an adjusting factor which offsets the decrease of the wage capital.

In this way, the first riddle of the paradoxical Scheme presented by Tougan Baranowsky lies in the arbitrary treatment of the composition of capital. He manipulates this composition like a magician, sometimes making it 300 percent (Year 1), other times 400 percent (Year 2) and 533 percent (Year 3). Only by this cunning manipulation, he manages somehow the balances between three departments to be maintained.

But can the rising composition of capital always compensate the decrease of the wage capital? The organic composition of capital primarily depends on the technique which is

given at one time, one industry, one country. Therefore, arbitrary treatment of the composition is not allowed. More striking is the fact that whole of accumulation of capital is turned into constant capital only, so that the composition of additional capital $\frac{\Delta p}{\Delta a}$ is infinitive. The rise and the degree of the rise of the composition are not a matter of mere calculation on paper, but a real reflection of what is going on inside factories. Here the phantasy of his scheme is clear.

2. *The rate of surplus-value.* Under the presupposition of the decrease of labourers' consumption, the labourers and wage capital a also decrease. If the rate of surplus-value $\frac{r}{a}$ remains constant, the surplus-value r would naturally decrease. Then, the accumulation and capitalist consumption would decrease. If so, the endless development of means of production producing department (Department I) would be impossible and Department III should shrink. The equilibrium between the three major departments would be broken. To avoid this chaos, one has to raise the rate of surplus-value as much as shown on Table 3.

But how is it possible? Can one raise the rate of surplus-value as he will? Tougan Baranowsky clearly denies the theory of labour value, saying that prices of commodities are not determined by the amount of labour bestowed upon them, but by the amount of capital invested in the production of the commodities. Then he denies the theory of surplus-value:

"The part of capital called by Marx constant capital is as well a source of profit as variable capital. So whole of the Marx's theory of profit breaks down into pieces. The 'vulgar economics', which observes the whole capital as a source of profit, is correct."⁶

"I do not use the ordinary marxist terminology (constant capital, variable capital and surplus-value), since I do not stand on the same ground as the theory of surplus-value of Marx. According to my observation, the creation of surplus products—therefore profit—is not due to the difference between human labour-power and dead means of labour. One can call with the same right machinery variable capital as well as human labour-power, because the both produce surplus products."⁷

From his stand which can be observed distinctly from these paragraphs, it appears that profit can increase in face of the decrease of labourers and wage capital. But this appearance is quite wrong, if we look far into the detail. The total capital of Department II $p+a$ decreases absolutely from 480 of the first year to 450 of the second and then 427.5 of the third, while profit increases from 120 to 150 and then to 172.5. Also, the total capital of Department II decreases absolutely from 544 to 465.8 and then to 435.8, while profit increases from 136 to 155.2 and then 175.2. Tougan Baranowsky's theory of profit was that the source of profit was the total capital itself. But, now the total capital itself *does* decrease and profit *does* increase! His scheme of paradox contradicts itself with his theory of profit.

Thus, we clearly see that he manipulated the figures of profit and raised the rate of surplus-value so arbitrarily in order to maintain the balance on the reproduction scheme.

3. *The rate of accumulation.* Table 3 indicates that the rate of accumulation is supposed to rise every year and at different rates in each department so much as to support his unrealistic supposition of the decline of labourers' consumption and the balance between departments. But this manipulation of the rate is really groundless.

⁶ Tougan Baranowsky, *Theoretische Grundlagen des Marxismus*, 1905, S. 188.

⁷ Tougan Baranowsky, *Studien zur Theorie und Geschichte der Handelskrisen* in England, 1901, S. 18.

Now it has become very clear why Tougan Baranowsky's paradoxical scheme of reproduction could tell another story. It is simply because the three ratios were manipulated so arbitrarily that his paradox could be real and the balance between departments could be maintained. Here is the secret of his paradoxical scheme of reproduction.

III. *The Analysis of Preferred Development of Department I to II*

Why does Department I develop preferably to Department II in the upward swinging period of a business cycle? What factors or grounds underlie the lead of Department I and the lag of Department II or the relatively independent development of Department I of II? Let us examine the following four grounds.

1. *The rise of the organic composition of capital.* This is the largest ground backing the preferred development of Department I to II. As well known, V.I. Lenin introduced this factor into Marx's reproduction scheme and established the law of preferable development of Department I to II in the long process of capitalist development. But, he did not refer to one particular short phase of a business cycle, for example, the prosperous period. We will see Lenin's law is valid not only in a long run but also in a short run, the phase of prosperity.

First of all, we have to ask why the composition of capital rises. The answer is the competition of capital. Each capital competes with one another in search for higher profit and tries to lower its individual value under market production-price in order to get extra profit. Chart 2 indicates how the manufacturing cost of ethylene is reduced by extending the scale of production. Now, six plants with the scale of 300,000 tons per annum are operating and three more are coming next year in this country. Six yen per kg and the total of 16,000 million yen per year is saved by the shift of the scale of production from 100,000 to 300,000 ton per year.

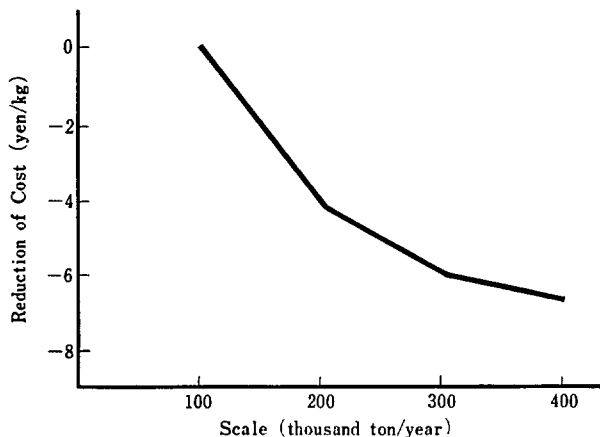
In this way the competition of capital forces every individual capital to adopt new production method and consequently raises the ratio of constant capital to variable capital $\frac{c}{v}$. Then, the demand for means of production relatively increases and the demand for consumption goods relatively decreases. The change in the structure of demand induces the change in the structure of production; Department I will develop preferably to Department II. The tempo of development of Department I will be greater than that of Department II.

To prove statistically the rising composition of capital is not easy, because constant capital and variable capital are not categories used in official statistics of capitalist countries. The total of annually paid wages cannot be regarded as variable capital directly, because it turns over several times a year.⁸ It is impossible to find this accurate rate of turnover and so the composition of capital in Japanese official statistics. Therefore, we have to be content with an approximate tendency deducted in the following way.

The organic composition of capital has its foundation in the technical composition of

⁸ Even Joseph M. Gillman, who investigated the long tendency of the rate of profit in manufacturing of U. S. A., says; "The variable capital v is the wage bill of production workers and it corresponds roughly to 'wages' in that census". (*The Falling Rate of Profit*, 1957, pp. 115-6.)

CHART 2. THE SCALE OF PRODUCTION OF ETHYLENE AND THE REDUCTION OF MANUFACTURING COST



Note: Estimated by Ministry of International Trade and Industry, Japan.

capital. One index of this technical relation might be shown by 'Capital intensity' or 'Fixed capital per worker'. Let n represent number of workers employed, F fixed capital, z circulating capital, w wage per worker and suppose the ratio of F to z = a constant. Then we get:

$$\frac{c}{v} = \frac{F+z}{n \times w} = \frac{F+F \times a}{n \times w} = \frac{1+a}{w} \times \frac{F}{n}$$

The composition of capital is the function of two variables, that is, w (wage per worker) and $\frac{F}{n}$ (Fixed capital per worker). Now, let us examine the movement of these two variables during years 1952-1969, based on the data given by *Bank of Japan*. Chart 3 shows that fixed capital per worker grows more rapidly than wages. So we can conclude that organic composition of capital rose during the so called 'high growth period' of Japanese economy which was interrupted in 1958 and 1965 depressions.⁹

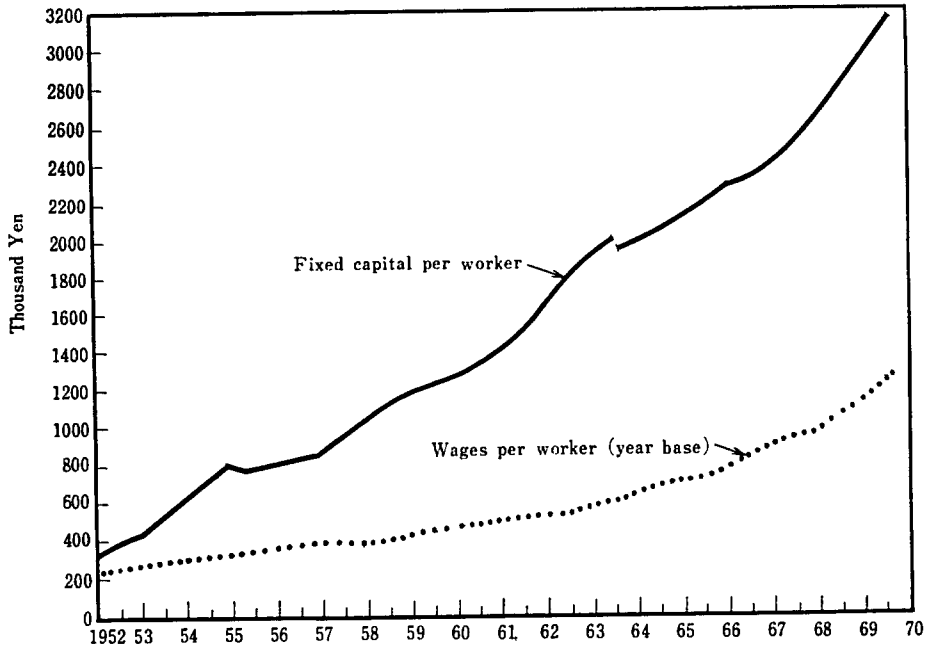
2. *The period of construction required in Department II.* This is the second ground supporting the preferred development of Department I to II. The period of construction or gestation is required in Department II until the factories are constructed and goods for consumers are sent to the market. The period of construction in Department I does not matter in our present case, because the gap between the lead of Department I and the lag of Department II is our problem and figures of Department I in the reproduction scheme are always values of goods already produced.

A. Aftalion once estimated the period to be two to three years for locomotives, one to two for freight and passenger's cars, zero to one for ships.¹⁰ D.H. Robertson estimated the

⁹ Only big corporations which possesses the capital of over one billion yen are included in the data, which makes the limit of the data.

¹⁰ A. Aftalion, *Les Crises périodiques de Surproduction*, Tome II, 1913, pp. 115-116.

CHART 3. THE MOVEMENT OF CAPITAL INTENSITY AND WAGES



Source: *Shuyo Kigyo Keiei Bunseki* 『主要企業経営分析』
(Analysis of Accounts of Main Corporations), Bank of Japan.

TABLE 4. THE PERIOD OF CONSTRUCTION

Industry	The Period of Construction	
	as of Sept. 1957	as of Feb. 1958
Electricity	2 years 4 months	2 years 7 months
Iron & steel	2 " 2 "	2 " 5 "
Coal	3 " 7 "	3 " 11 "
Chemical	1 " 5 "	1 " 6 "
Machinery	1 " 11 "	1 " 11 "
Textile	1 " 3 "	1 " 4 "
Paper & pulp	1 " 3 "	2 " 0 "
Sea-transportation	11 "	10 "
Land-transportation	3 " 0 "	3 " 2 "
Gas	1 " 10 "	1 " 5 "
Average	2 " 3 "	2 " 7 "

Source: *Keizai Hakusho* (White Paper on Economy), 1958, p. 115.

period of gestation to be about two years for railroads, fifteen months for blast furnaces, 12 to 18 months for ships and about a year for cotton spinning.¹¹

Table 4 shows that the average period of construction of all industry in Japan is about 2 years and 3 months (as of September, 1957) or 2 years and 7 months (as of February, 1958).

But the period of construction is given by industries, not by two major departments. We want to know the period of construction required in consumptive goods industries (Department II). So I made one investigation on this subject.

Fifty six representative corporations which produce consumers' goods were picked up and the period of construction was investigated for about ten years from 1961 to 1970 by the use of 'Yukashoken Hokokusho' (有価証券報告書) or 'Report on Valuable Securities' published semi-annually by Ministry of Finance of Japan. The detailed result of the investigation is published in my article "Two Departments Analysis of Prosperity". Table 5 is just the summary of the investigation.

TABLE 5. THE PERIOD OF CONSTRUCTION IN DEPARTMENT II (SUMMARY)

Industry	Number of corporations	Number of constructions	Average period of construction (months)
1. Food, beer	24	480	11.16
2. Clothing	6	79	12.13
3. Chemical	10	110	13.42
4. Aluminium	1	55	18.33
5. Sewing machines	1	11	11.73
6. Electric appliances	4	72	22.40
7. Passengers' cars	2	93	33.24
8. Cameras and watches	5	82	13.73
9. Chinawares	1	9	13.56
10. Miscellaneous (Printing, publishing, pianos, etc.)	2	47	14.62
Total	56	986	14.75

Source: Katsuhiko Matsuishi, "Two Departments Analysis of Prosperity", *Keizai-gaku-Kenkyu*, Annual Report of Hitotsubashi University, No. 15, 1971, Appendix.

The total average (simple arithmetic average) covering ten industries, fifty six corporations and nine hundred eighty six cases is 14.75 months. The period of construction in food industry is 11.16 months, which includes ham, sosage, cheese, flour, sugar, confectionary, milk, beverage, oil, seasoning, ice cream, beer and so on. Clothing including socks, carpets, textiles etc., requires 12.13 months for construction. Chemical including soap, margarine, medicines, film, tooth cream etc., requires 13.42 months. The period of construction for electric appliances is rather long, 22.40 months. Such items as television and radio sets, taperecorders, coolers, fans, refrigerators and so on were investigated. Corporations investigated are 'Sony', 'Matsushita' (brand name 'National') and 'Mitsubishi'. The period of construction for transportation machinery (mainly passengers' car) is the longest, 33.24 months. Corporations investigated are 'Toyota' and 'Nissan'. The period of construction required to

¹¹ D. H. Robertson, Some Material for a Study of Trade Fluctuations, *Journal of the Royal Statistical Society*, Vol. 77, Jan. 1914, pp. 159-164.

build factories or machines for cameras and watches is below the average 13.73 months. Camera includes ‘Nikkon’, ‘Cannon’ and ‘Olympus’. Watches includes ‘Seiko’ and ‘Citizen’.

The cases investigated are mainly installation of machinery and are mostly confined to partial constructions. The construction of one whole factory or plant, the initiation of whole big corporations are excluded in original data.

Anyway, the period of construction lies between the enlarged production of Department I and the following enlargement of production of Department II, and causes the lead of Department I and the lag of Department II.

3. *The rising rate of accumulation.* This is the third ground resulting in the preferable development of Department I to II. During the prosperous period, more and more profit is obtained by capitalists and it is not wasted by them, but accumulated. The competition of capital in search for more profit forces every capitalist to accumulate. Consequently the rate of accumulation rises.

Let’s denote profit by m , accumulation by ma , additional constant capital by mc , variable capital by mv and capitalists’ private consumption by mk . Then:

$$m = ma + mk = mc + mv + mk$$

We already examined the influence of the rising composition of capital $\frac{c}{v}$ upon the gap between Department I and II, so we suppose this composition constant now.

Suppose the rate of accumulation rises, and mk decreases by ak . Then,

$$mk_1 = mk - ak$$

$$mc_1 = mc + ak \cdot \frac{mc}{mc + mv}$$

$$mv_1 = mv + ak \cdot \frac{mv}{mc + mv}$$

The demand for productive goods DI and the demand for consumptive goods DII were originally as follows.

$$DI = mc \dots\dots\dots(1)$$

$$DII = mv + mk \dots\dots\dots(2)$$

Now, new demand is respectively:

$$DI_1 = mc_1 = mc + ak \cdot \frac{mc}{mc + mv} \dots\dots\dots(3)$$

$$DII_1 = mk_1 + mv_1 = mk - ak + mv + ak \cdot \frac{mv}{mc + mv} \dots\dots\dots(4)$$

So, (3)-(1)

$$\left(mc + ak \cdot \frac{mc}{mc + mv} \right) - mc = ak \cdot \frac{mv}{mc + mv} > 0$$

$$\therefore DI_1 > DI \dots\dots\dots(5)$$

(4)-(2)

$$\left(mk - ak + mv + ak \cdot \frac{mv}{mc + mv} \right) - (mv + mk)$$

$$= ak \left(\frac{mv}{mc + mv} - 1 \right) = ak \cdot \frac{(-mc)}{mc + mv} < 0$$

$$\therefore DII_1 < DII \dots\dots\dots(6)$$

Now it is proved from (5) and (6) that the demand for productive goods increases and the demand for consumptive goods decreases, as the rate of accumulation rises. The ratio of Department I to II will have to rise in accordance to the change in the structure of demand. Consequently Department I develops more rapidly than Department II.

4. *The indirect connection of Department I and direct connection of Department II to consumption.* This is the last ground backing the preferred development of Department I to II. This originally lies in the nature of each department. Department I produces means of production and Department II means of consumption. So Department I is connected with final consumption indirectly only via Department II, while Department II is directly connected with final consumption. Surely one sub-department of Department I producing means of production for Department I (Department Ia) is two stages far from the final consumption and puts on the appearance that it is not connected with the final consumption at all, but as far as it is connected with the other sub-department of Department I producing the means of production for Department II (Department Ib), it is certain that Department Ia is connected with the final demand. The structure of production is three-folded:

Ia→Ib→II→final consumption

Therefore, the fluctuation of Department I is much bigger than that of Department II. Department II is always checked and controlled by the final consumption in the market. This is the ground backing the relatively bigger amplitude of fluctuation on the side of Department I.¹²

This is very important in the real business cycles. The first three factors can only explain rather normal balanced development of the two departments, though unproportionate. But the last one can explain the unbalance between the two and overproduction on the side of Department I which is merely a reflexion of overproduction of Department II to the final consumption demand. But to explain this fully needs another paper.

IV. Conclusion

In the previous paper we observed mainly statistically the actual state of the relation between the two major departments and in the present paper we investigated theoretically what grounds or factors were backing this real state of the relation. This investigation gave light to the structure of production in the real period of prosperity, namely the competitive process of capital. From now on we can observe the production as a whole, with no special regard to the inner structure of production. No one can insist any longer that productive consumption can develop production endlessly during the prosperous period, no matter how miserable consumption might be. It is because productive consumption necessarily enlarges the production of consumption goods.

Then, it matters how is the movement of consumption against the movement of production

¹² So-called 'Acceleration Principle' seeks its cause in that the demand for capital goods depends on of not the *absolute level* of consumption, but the *rate of change* of consumption. (J. M. Clark, *Business Acceleration and the Law of Demand*, *Journal of Political Economy*, Mar. 1917.) I don't adopt this 'principle', partly because the initial change of consumption cannot be explained inherently and necessarily in the ever-swinging-up process of a business cycle. If it should happen accidentally, we cannot use it for the explanation of business cycles. Further over-all examination of the principle has to await a later date.

of which inner structure we so far observed. How does production move, relate to and contradict with consumption? The treatment of this subject should await a forthcoming paper.