

SHORT BIOGRAPHY FOR HIROSHI OHNISHI

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He has three research fields. One is a new mathematical modeling of Historical Materialism. The second one is rebuilding statistical epistemology of social statistics, and the last one is quantitative analysis of the East Asian economies, especially China.

He has published more than 200 articles in different journals such as "Political Economy Quarterly", "Statistics", "Journal of Econometric Study of Northeast Asia," and has written or compiled over 40 books. Among them, 10 books are single author books, including one book translated into Russian, two books translated into Chinese and Korean.

A Marxist=Neo-classical New Modeling of Capitalism

Hiroshi Ohnishi

I. What Was ‘Socialism’?

Still now, the most important problem for us is to understand so-called ‘socialism’. Or in other words, was the collapse of them the end of socialism? Without answering this question, we Marxist cannot say anything.

My answer was that that collapse was the progress from state-capitalism to private-capitalism, because state-lead capital accumulation is general in the world as is shown in **Table 1**. That is 'state capitalism' in Japan before 1945, in Germany before 1945, in Indonesia before 1967, in Egypt before 1970, in Russia before 1991, in India before 1991, and in China before 1978. And all of these countries became 'private capitalism' after these years. Although there were some differences between Japan, Germany, Indonesia, Egypt, India and China, Russia, all of them accumulated capital rapidly rather than the period of ‘private-capitalism’.

Table 1 Two Stages of Capitalism and Their Leading Political Parties

	State Capitalism	turning point	Private Capitalism
Japan	Taiseiyokusankai	1945	LDP
Germany	NAZI	1945	CDU
Indonesia	National Party(Sukarno)	1967	Gorkal(Suharto)
Egypt	Nasser	1970	Sadat
China	CCP(Mao)	1978	CCP(Deng)
Russia	Communist Party	1991	Yeltsin
India	National Congress(Nehru)	1991	National Congress(Rao)

II. What Is ‘Capitalism’?

However, to confirm the above understanding, we should redefine ‘capitalism’, because we cannot use the word ‘state capitalism’ without knowing what is capitalism. Therefore, in this section, I want to reveal my understanding on ‘capitalism’ clearly based on its technological base, because 'capitalism' or 'socialism' is categories of

historical materialism.

Then, first, let me explain 'feudalism' to identify 'capitalism' from its precedence society. In my opinion, the society before industrial revolution did not have any 'machine' and had only tools, and craftsmen made different qualities of products by using same quality of tools. If so, what was the cause which made its difference? I think its difference came from the difference of skill, and in this sense that type of society's most important task was to brush up skill in national level. For this purpose, that society made seniority system, because senior craftsmen were more skilled and productive, and by this system craftsmen could work in same factories through lifetime in order to brush up their skill enough. Under this condition, human relationship became an apprenticeship which was translated into philosophy as Confucianism.

Needed characteristics of that society were not only this one. Besides it, that society limited the sizes of factories because large number of craftsmen could not learn from their one master in one factory. It was because of characteristics of this type of skill. Modern type of skill can be taught in a large class, but feudal type of skill was hidden and could be learned only by imitating their masters' way by close watching. Therefore, that society had to divide its market town by town in order to restrict its size of factories. That system was the guild system.

However, these all necessities were lost after the industrial revolution because of appearance of machine. In this new society, quality and quantity of products are decided by quality and quantity of machine, and workers become unskilled and just affixes. And the most important change from the former system was their weak bargaining power against capitalists, because now capitalists can gather unskilled workers easily from labor market. Now, anyone in labor market can substitute workers in their factories.

Therefore, under this condition, workers' wages become lower and profits become higher, and most part of profits are used re-investment and sizes of machines become larger. Here, because we assumed that sizes of machines decide sizes of products after the industrial revolution, this re-investment means economic

development. That is, the capitalist way of economic development!

However, on this point, we should note some points, and the first one is on our attitude toward capitalism. That is, we are not criticizing capitalism but just explaining why we need capitalism after the industrial revolution. In other words, when capitalism should be introduced, capitalism should be introduced by Marxist. It is completely same as the fact when socialism should be introduced, socialism should be introduced by Marxist. This must be the only attitude that true Marxist should have on this problem.

Secondly, this understanding is very historical and materialistic, because in my framework technologies decide superstructures and they change historically. I think, even if my understanding is very different from existing type of Marxist understanding, 'historical' and 'materialistic' are the most decisive characteristics and so my understanding must be a Marxist understanding.

Thirdly, my understanding on the society after the industrial revolution is proper to be named as 'capitalism', because in this society capital is the principal, and whole social system is served in order to accumulate it. For example, Protestantism served for this purpose in the Western world, while Confucianism and Buddhism were changed for its purpose in Edo era in Japan. Sates established educational system for different types of needs in modern era, and gathered social surplus in order to build social infrastructures.

III. Neo-classical Way of Modeling of Capitalism

As I mentioned above, this understanding on capitalism can be understood as a kind of Marxist understanding. However, same understanding also can be understood by a neo-classical type of model. By showing it, I would like to confirm and strengthen our understanding. Then, to do so, we firstly formalize an economy by the following two production functions

$$Y(t) = [s(t)L]^{1-\alpha} K(t)^\alpha$$

(1)

$$\dot{K}(t) = [1 - s(t)]L$$

(2)

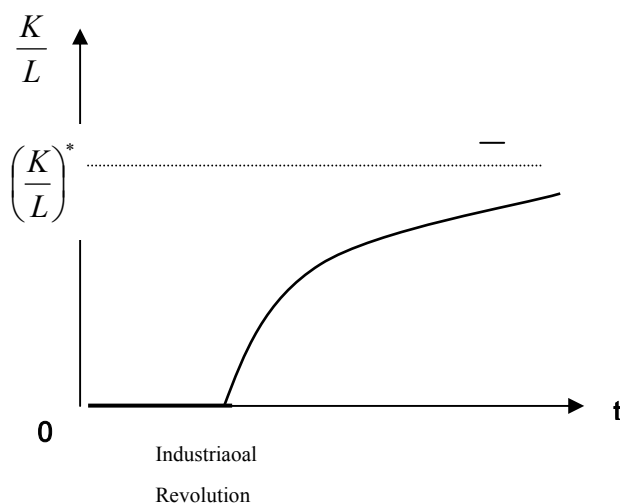
Here, Y , K , L , s , and α express production of consumption goods, capital stock, total labor, ratio of total labor used for production of consumption goods, and technology respectively. Please note that s can be understood as the share for people in short term, and $1-s$ can be understood as the share for capital. And we assume constant return to scale in the production function of consumption goods. Here, this economy maximizes its total utility¹⁹ by maximizing total consumption during unlimited period. That is;

$$\text{max } U = \int_0^{\infty} e^{-\rho t} \log Y(t) dt \tag{3}$$

$$\text{s.t. } \dot{K}(t) = [1 - s(t)]L \tag{4}^{20}$$

Here, ρ shows time preference of its representative individual. And solutions of this maximization problem can be expressed as the following figures.

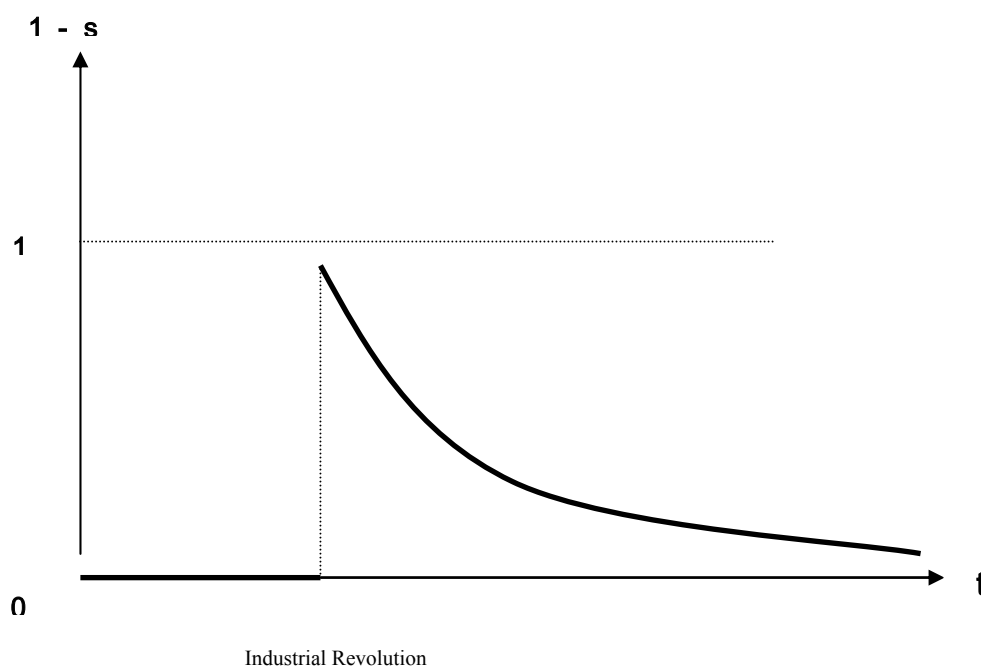
Figure 1 Optimal Growth Path of Capital –Labor Ratio after the Industrial Revolution



¹⁹ It is assumed that instantaneous utility is logarithm of Y

²⁰ Even if some capitals are used to make machines, we can neglect such capitals. It is because (1-s)part of total labor is used in equation (4) totally, that is directly and indirectly.

Figure 2 Optimal Growth Path of ‘Saving Ratio’ after the Industrial Revolution



As is shown in the graph, the saving ratio (we can interpret it as saving or investment ratio) of total labor used for production goods has jumped at the industrial revolution²¹, because capital accumulation was not used before industrial revolution and became critical after that, and after that this ratio becomes smaller gradually, and ultimately it reaches almost zero besides depreciation when its capital labor ratio reaches at its ultimate equilibrium value. Therefore, we could use all of labor for near-term consumption not for capital in the feudal era, but after that and until its ultimate value will be reached we should give up consuming at maximum level in the instant and should accumulate capital as a capitalist era. We should experience this era until we will reach at the next era which can be called as post-capitalism or 'communism'.

Furthermore, we have to note that our model keeps not only historical materialism but also labor theory of value and surplus value theory of Marx in the following way.

²¹ We assumed σ had jumped from 0 to a certain value (larger than 0 and smaller than 1).

First, our model expresses the economy as an optimal detouring production system using machines. The word ‘optimal’ means maximizing the amount of production by the same labor, or in other words, minimizing the needed labor to produce the same amount of goods. So, here the only measurement of the production is labor.

In order to explain it, as an example, now we assume four kind of technologies whose amount of products are same; those are as follows:

the 1st technology whose factor combination is zero machine and 1000 hours human labor,

the 2nd technology whose factor combination is 5 machines and 200 hours human labor,

the 3rd technology whose factor combination is 10 machines and 50 hours human labor,

the 4th technology whose factor combination is 20 machines and 20 hours human labor.

Please note that these four technologies produce same amount of products. And then, if we assume again that one machine can be produced by 10 hours human labor, total labor which are needed in the above four technologies are

$0 \times 10 + 1000 = 1000$ hours, in the 1st technology,

$5 \times 10 + 200 = 250$ hours, in the 2nd technology,

$10 \times 10 + 50 = 150$ hours, in the 3rd technology,

$20 \times 10 + 20 = 220$ hours, in the 4th technology.

Therefore, the 3rd technology should be chosen by the human society in order to minimize the needed labor to produce the same amount of goods (in this sense, we can call it as ‘optimal capital-labor ratio’.²²), and we should recognize that the only

²² Strictly speaking, machine production of today can produce final goods tomorrow while direct input of labor produce them today. Therefore, we have to take account of the time difference, and ‘optimal capital-labor ratio’ has to be introduced by the following equation;

$$\frac{\partial Y}{\partial K} \frac{dK}{dL} \frac{1}{\rho} = \frac{\partial Y}{\partial L} \quad (i)$$

measurement is labor here. This is a labor theory of value.

However, in fact, to reach at its final goal is not easy, because needed capital accumulation for the 3rd technology is very huge and over one-year total products. Therefore, human society should spend much time to reach at this point and go through the path which should be calculated by its time preference ρ . It is the 'optimal path' to the ultimate goal, and in this sense, we can identify how long we need to reach at there, in other word, how long do we should experience the capitalist era. In my opinion, because this part of national products for this capital accumulation serves capital not people directly, this part can be understood as exploitation by capital from workers. Of course, as I mentioned above, this exploitation can be justified in the wider sense of historical materialism, because it serves people in the long run. At least, by this understanding, we can expand labor theory of value into a historical perspective, and can define 'exploitation' quite differently of an older type of Marxism.

IV. Asset Disparity and 'Exploitation' in Our Dynamic Model

However, above model is not enough to express very important social relations between rich and poor. Strictly speaking, in our model, 'exploitation' is understood as investment ratio of GDP or ratio of labor used for capital accumulation in the sense

Here, ρ shows time preference. The right hand side expresses marginal effect of direct labor input and the left hand side expresses that of indirect labor input discounted by time preference, and they have to be equal, because if they are not equal, the shorter side of input is not enough and much more part of labor has to be input for this production. Solving this equation, first we set a little different production functions from equations (1) and (2). These are

$$Y = L^{1-\alpha} K^\alpha \quad (\text{ii})$$

$$\dot{K} = L. \quad (\text{iii})$$

The reason why there is not the ratio of total labor used for production of consumption goods in this equations is that we need only the technological conditions of these two production functions to solve equation (i). Then, we get strict sense of 'optimal capital-labor ratio' as

$$\left(\frac{K}{L} \right)^* = \frac{\alpha}{1-\alpha} \frac{1}{\rho}.$$

that this part is not used for people's living needs directly. By this understanding, we could define 'exploitation' under equal society such as former Soviet Union and Mao's era in China, because 'capital' exploited people in these societies. But, on the other hand in reality, our society usually has disparity of income or assets among people, and this disparity gives the rich a social status to exploit others and the poor a status to be exploited. We can understand that this is the exploitation not by 'capital' but by 'capitalists'.

In my understanding, this type of 'exploitation' could be well-defined by analytical Marxists and a Japanese Marxist Shuhei Mizuchi (Mizuchi 1984). They insisted that under the technology of diminishing return to capital transfer of capital from the rich to the poor makes much production, and usually this transfer is done as a kind of 'lease' of them to the poor by the rich. Here, this word 'lease' means not only 'lease' itself but also wage-employment, because the only difference between 'lease' itself and wage-employment is the place where the poor works, or in other words, where the machines were operated.

One example of this 'lease' contract is shown in **table 2**.

Table 2 Lease Contract between the Rich and the Poor and the Change of Production

	The Rich			The Poor			Whole Society		
	capital	labor	production	capital	labor	production	capital	labor	production
Initial Holding	10	1	3	2	1	1	12	2	4
after Lease	6	1	2.5	6	1	2.5	12	2	5

Here in **Table 2**, four units of capital are leased to the poor by the rich, and by this lease contract, capital-labor ratio of both sides become equal. This is the optimal for the whole society under this technology, but problem is who can take the surplus which is made by this exchange. Analytical Marxists assumed that all of this surplus

will be taken by the rich, because they are stronger than the poor, and they defined the acquisition of this surplus as ‘exploitation’ by the capitalist.

Therefore, we have to research its dynamic path of these two classes in our model which is expanded to two class model, and our basic conclusion is that in the long run, this asset disparity will finally disappear as the result of the asset accumulation of the poor, and both of the lease and ‘exploitation’ will be terminated because this disparity is the precondition of the lease contract. Therefore, when we will reach at the stage of optimal capital-labor ratio shown in footnote 4, capitalism will end, and at the same time, all of rich-and-poor disparity, wage-payment and ‘exploitation’ will be terminated.

Exceptional Case of Persistent Disparity, ‘Exploitation’ and Over-accumulation

However, strictly speaking, under some conditions, such asset disparity cannot disappear, and so, wage-employment and ‘exploitation’ persist to exist. These conditions are as is shown below.

1) If there are some differences of time preference between the classes, these optimal capital-labor ratios become different, because this ratio is also a function of time preference as we showed in footnote 4. Therefore, both classes will stop their accumulation when they will reach at the final goals: these optimal capital-labor ratios, and they will continue make a ‘lease’ contract, because in this point, they also have asset disparity. In reality, in many countries, there are many ethnic groups whose time preference is quite different, for example, the Jewish and others in U.S. or the Chinese and others in the Southeast Asian countries.

2) One more condition is a little bit complicated, because it needs many sub-conditions. First, the entire surplus which is produced by the ‘lease’ contract is taken by the rich. Second, there is no depreciation. Third, there is no capital market where the rich can sell their capital to the poor. Fourth, the rich does not make long-term rational expectation. Under these conditions, even if the rich already reached at the final goal, he can make a ‘lease’ contract with the poor, and receive the surplus, and to maximize this surplus, much more capital accumulation by him is

better for him. Therefore, his capital asset will be over the ‘optimal’ capital-labor ratio, and on the other hand, the poor also continue to accumulate capital to the ‘optimal’ capital-labor ratio, and finally, capital-labor ratio of the whole society will be over the ‘optimal’ ratio. I call it as a ‘over-accumulation’ shown in APPENDIX.

In reality, I think the first type of persistent ‘exploitation’ is more serious, and here, contradiction of the interest between the rich and the poor becomes between the ethnic groups. However, I also think that this problem is not the problem of socialism and capitalism, and has to be solved by other social philosophies even if they can coexist with Marxism.

Therefore, the most important problem here is the second one, but we have to note two points on this second condition. That is,

i) This condition is very special, and not so common. Therefore, as I said above, we can neglect this possibility usually, and can understand that capitalism will end when we will reach at the ‘optimal’ capital-labor ratio.

ii) However, if we focus on this possibility, we can find some method to avoid this over-accumulation. For example, the welfare state or progressive taxation by the social democrats is a way to rise consumption and restraint investment. Another one is a way by the trade unionist. They claim some part of ‘surplus’ which is produced by the ‘lease’ contract, and by this sharing, incentives of the rich to invest can be weakened. These ways can be understood as non-Marxist ways, because they do not terminate ‘exploitation’ itself. However, Marx wanted terminate ‘exploitation’ by confiscating the capitalist’s poverty directly.

In my opinion, the last one that is claimed by Marx is not so realistic now, and therefore, we have to find another way, and my proposal is to establish capital market for the rich to sell him capital. In other words, this proposal is the way to fill the conditions that lead to the simultaneous approach to the optimal capital-labor ratio by both the rich and the poor. We could find this way by the above strict research.

One more point that we have to note here is that our way also terminates ‘exploitation’ itself, and in this sense, it can be regarded as a Marxist way. In Japan, we

have many professors who do not think Marx's way was not always confiscation. And in reality, Marx anticipated the possibility of share holding companies in the future. It is also neo-classical, as our model is a kind of neo-classical. Is it accidental or not?