

ECONOMIC GROWTH AND AGRICULTURE

—with special reference to the productivity-employment problem—

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1. *Introduction: the actual situation*

The main purpose of this paper is to analyze the problems of agriculture in the long run process of economic growth with special reference to the productivity-employment phase. Throughout this paper I will have in mind the historical experience of Japanese agriculture and economy. Therefore it may be helpful to foreign readers to describe briefly this experience before entering the main subject. This historical sketch may also be useful in understanding some new concepts which will be introduced as convenient devices to approach those problems which are common to the so-called over-populated countries of which Japan is a case.

The circumstances surrounding post-war Japanese agriculture have drastically changed in the following three respects: international prices and production can no longer be ignored; population pressure weighs heavily not only on Japan's food resources, but on her employment problem; and the land reform has profoundly affected the economic and social status of the farmer.

By losing two rice-growing territories, Korea and Taiwan, Japan suddenly became one of the world's great grain importing countries after the last war. Her position up to that time had been one of near food self-sufficiency in her economic bloc. In recent years the average import percentage of some principal food-commodities consumed has become as follows; rice 10, wheat 50, barley 40, soybeans 25 and raw sugar 95. The normal total value of food imports is 600 million dollars annually, which composes about thirty per cent of the total value of Japanese imports. This naturally constitutes quite a heavy drain on Japan's foreign exchange reserves. At the same time, because of the heavy food imports, Japanese agriculture increasingly has become subject to changes in the international grain market. Specifically the recent trend toward an over-supply of agricultural products in the world has exerted a strong pressure on the domestic price level of agricultural products in Japan.

Japanese agriculture has had to absorb a considerable portion of the

post-war increase in population and labor force, resulting from natural population growth and the absorption of Japanese repatriated from the overseas Empire. During the two decades 1915-1935, the population gainfully occupied in agriculture remained almost unchanged, amounting to 13.6-13.7 million, which in 1935 composed 44 per cent of the total gainfully occupied population. Since emigration during that period was very small, the net increase in rural labor force was absorbed almost entirely by non-agricultural industries. This can be described as the normal pre-war situation, although a slight decrease occurred from 1935 until the beginning of the Pacific War. However this situation changed suddenly after the war. The population gainfully occupied in agriculture was 16.5 million in 1955, which is 2.8 million bigger than the normal pre-war level. The arable land area, on the other hand, has actually decreased after the war, despite incentives offered by the Government to increase arable land. Hence, the average arable land area per farm household has decreased to 0.85 hectare from the pre-war one hectare level. In other words, the land-labor ratio in post-war Japanese agriculture has become even worse than the pre-war one, which had been widely known as one of the most unfavourable in the world. Furthermore, since the high rate of increase of the labor force (2 per cent a year) is expected to continue during the next ten or fifteen years, the situation in the rural area is expected to worsen in the near future.

However, the post-war land reform has reduced the area of tenanted arable land to less than ten per cent of the total arable land, so that almost all the farmers now cultivate their own land, without paying high rent to landlords. Before the reform about 46 per cent of the total arable land was tenanted and the landholders got a considerable portion of the production as rent in kind from tenant farmers. This drastic change has had a very favourable effect on the economic and social status of farmers. Most of them have become independent economic units cultivating their own land, and their earned income has risen considerably above the low pre-war level. Up to the present, the larger portion of the increased income has been spent on raising their low level of living (in other words, the propensity to consume has been very large), so that the productivity effect of this reform is not yet particularly sizable. But it is widely believed that in long run favorable effects can be expected in productivity. However, I would like to draw attention to one point, namely, the transformation of economic, social and political status of the farmers. Their standard of living has risen to the point where now their real income is almost equivalent to that of the urban working class. Actually, a notion that some sort of income parity should exist between farmers and urban workers has been introduced since the reform. If this notion were not put to practice to considerable extent, farmers would be much less

happy than they were in the pre-war days. It is clear that this new situation makes it politically difficult to abandon price control and let international competition determine the price level, and also to take a *laissez-faire* position in respect to the employment problems stemming from the situation mentioned above.

These are the difficulties confronting the Japanese economy with respect to agriculture. It is of course not an easy task to make any long run projection of the Japanese economy with particular reference to agriculture. I think, however, that the five year plan compiled by the Government last year may be mentioned as one view of what the future holds for the Japanese economy. The five-year plan has two major objectives—one is the attainment of self-support or of balancing the foreign exchange and the other is the achievement of the so-called full employment by 1960. As far as agriculture is concerned, it will be sufficient for the time being to point out that there are two targets to be noted in this general programme; one is that the estimated future increase of demand for main food is to be entirely supplied by increasing the domestic production of food, not by increasing imports; and the other is that agriculture is expected to absorb by 1960, 760,000 additional workers. This means that the population gainfully occupied in this sector will have increased 3.5 million over the normal pre-war level. This implies, of course, that the economic planners did not expect the non-agricultural industries to absorb the additions to the labor force in agriculture, as happened in the pre-war period. These two targets show eloquently the role expected to be played by the domestic agriculture.

According to this five-year plan, the growth rate of GNP is projected to be 5 per cent a year, and the annual rate of increase of the labor force 2 per cent, so that the annual rate of increase of labor productivity is expected to average 3 per cent for the years planned. In comparison with this rate for the economy as a whole the annual rate of increase in agricultural productivity is estimated to be 2.4–2.5 per cent, which is derived from the two targets mentioned above. According to the outlined above it is clear that the productivity difference between agriculture and non-agriculture is expected to deepen in the future, even if the highly ambitious target of supplying increases in food needs should be successfully met.

These situations, I believe, involve the existence of a serious productivity-employment problem in Japanese agriculture, which is of a fundamentally different nature from the problems faced by Western countries.

II. *Product-equilibrium and factor-equilibrium*

Keeping in mind the actual situations explained above, I would like

to develop a systematic analysis of the subject by the use of models, in order to make clear the underlying relationships and the fundamental nature of the problem.

Before entering into the treatment of the main theme, I think it is necessary to make clear the characteristics of the three kinds of equilibrium, which respectively concern output, labor and capital, on the process of economic growth. It will be simply assumed that the economy is composed of two sectors, agriculture and non-agriculture at first. I want to define an equilibrium growth process of demand for and supply of the outputs of agricultural sector. This is simply described as the process which always keeps an equilibrium between demand and supply without causing any change of the relative prices in this sector. If we start from a certain equilibrium under a certain set of relative prices and assume that the rate of change of demand (D) occurs at exactly the same rate as the rate of change in supply (S), then this equilibrium process will be expressed by $S=D$, where the original relative prices remain unchanged throughout the whole process. So we can treat it as if it were a real term system as long as the general price level is assumed to continue unchanged.

A long term shift of demand for agricultural products is caused by changes in the following: population (including age structure), real income per head and tastes. Here, for simplicity, we will neglect the last factor and the age structure change. Then the growth rate of demand for agricultural outputs (D) will be expressed simply by the formula $p+\eta g$, where p and g stands respectively for the growth rate of population and that of real income per head, and η denotes the income elasticity of demand for agricultural products. This is simply derived in the following way; if we denote the increasing rate of demand amount per head by d , $D=p+d+pd$. Neglecting pd (since it is a negligible quantity) and considering $\eta=d/g$, we can get $D=p+\eta g$.

We assume, for simplicity, a closed system for the time being and also assume that the net products ratio to gross products is constant through the whole process, then the growth rate of net products (G_a) should be equal to that of gross products, namely $G_a=S$, and in the equilibrium growth process defined above we can get the equation $G_a=\eta g+p$. The above assumption of constant net products ratio is not unreasonable within limited growth periods, considered from the experience of Japanese agriculture.

On the other hand, if we denote the growth rate of the national economy by G , we get $G=g+p$. Combining these two equations, we get another simple one, $G-G_a=(1-\eta)g$. This is again easily transformed into the following equation,

$$G_n - G_a = \frac{1-\eta}{1-\omega} g, \quad (1)$$

where G_n stands for the growth rate of products of the non-agricultural sector and ω for the weight or percentage of agricultural net output to the national product. The above equation can easily be understood if we consider the self-evident relation $G = G_a\omega + G_n(1-\omega)$, which must lie between the three growth rates. Equation (1) shows the necessary relationship between the growth rates of the two sectors in the process of products-equilibrium growth under the assumptions mentioned above. The difference between the two sectors' growth rates ($G_n - G_a$), which is expressed simply by δ hereafter, is to be noted as an important concept. Under normal conditions the value of δ is plus, since we know that $0 < \eta < 1$, $0 < \omega < 1$ and $0 < g$.

I would like to give some numerical examples to illustrate the relation obtained above. According to empirical studies the average value of g , the growth rate of national income per head, was 2.5–3.0 per cent a year in the pre-war period. The value of η , the income elasticity of demand for agricultural products at farm has not yet been examined comprehensively, but some preliminary studies indicate that it was around 0.6–0.7 in the early period of capitalistic development and around 0.3–0.4 during the three decades before the last war. If we take ω to have been 0.6–0.7 and 0.3–0.4 during their respective periods, then the value of δ will have been equal to the value of g . In other words, in the products-equilibrium growth process, the growth rate of the agricultural sector should be smaller than that of non-agricultural sector by 2.5–3.0 per cent a year. This is a very rough measure of what the pre-war situation may have been. In general, in the long run, both η and ω have the tendency to become smaller, so that the value of δ does not change greatly in the growth process.

On the production-supply side, the growth rate of output of the agricultural sector will be treated as being determined by two factors, the rate of change of labor inputs and the rate of change of labor productivity. We will denote the rate of change of the agricultural labor input by n_a and that of agricultural labor productivity by g_a . Then we get a simple relation $S = g_a + n_a$. In this case also assuming the net products ratio as being constant, we can write the equilibrium growth process defined above as follows:

$$g_a + n_a = p + \eta g, \quad (2)$$

which shows that relationship among the five factors necessary to sustain a products-equilibrium process.

In the pre-war period, the population gainfully occupied in the agricultural sector had been almost constant as mentioned above, so that the value of n_a had been approximately zero. The history of capitalistic development shows that n_a was nearly zero in most countries, so that Japan's experience is not an exceptional one. The growth rate of agricul-

tural productivity g_a had averaged around 3 per cent a year in the early period and after the first world war it decreased to about 1-2 per cent, so that in the former period the condition of $S=D$ had been nearly satisfied (because $g_a=3\%$, $n_a=0$, $p=1.0\sim 1.5\%$, $\eta=0.6\sim 0.7$ and $g=2.5\sim 3.0\%$), whereas in the latter period Japan got into the situation of $S<D$.

The production side has generally been treated by production function analysis, and in this case also we are considering implicitly changes in the agricultural production function, which will be caused by various improvements of technique and increasing investments of capital. It is because of my particular intention to discuss the productivity-employment problem in the simplest possible form by use of the growth formula that the production function formula is not treated explicitly here. In the analysis of the agricultural sector in the process of growth, a clear distinction has not always been made of the products-equilibrium conditions and factor-equilibrium conditions, so that sometimes the treatment of this subject has not been notable for clarity. The products-equilibrium conditions obtained above, of course, do not necessarily involve the factor-equilibrium conditions, which we must proceed to make clear next.

By saying factor-equilibrium I mean here the sustained maintenance of equality of marginal productivity of production factors between the two sectors. For simplicity for the time being, I would like to treat only labor, neglecting the other factors. Labor productivity, when it is treated from the viewpoint of factor equilibrium, is inextricably related to the problems of wage income and that of the labor market. In the most simple case, we can assume that the marginal productivity of labor is equal to the prevailing wage rate under a perfect competitive situation. If our model is always at this simple situation, there is no tendency for labor to move between the two sectors, and perfect resource allocation will always be maintained. I would like to rely upon this simple assumption for the time being, although it is very far from the actual situation experienced in Japanese economy, which I would like to discuss later on.

In order to discuss the labor-factor equilibrium in this meaning, I bring in the concept of equal growth rates of productivities, a process where the labor productivity of the agricultural sector is always increasing at the same pace as that of the non-agricultural sector. If we start from a situation in which the productivities of both sectors are equal to each other, then in the process of equal growth rates of productivities we can expect that the absolute level of labor productivity in each sector will be kept always equal to each other. Now, we have already the relation, $G_a=g_a+n_a$ with respect to the agricultural sector. Just corresponding to this, we can write $G_n=g_n+n_n$, concerning the non-agricultural sector. And in the process of equal rates of changes of productivities, g_a must be equal to g_n , so that we easily get $G_a-n_a=G_n-n_n$, or the following equation,

$$G_n - G_a = n_n - n_a \quad (3)$$

which shows the necessary relationship between the two sectors to maintain the equal productivity growth rate. So far as the treatment above is concerned, the productivity concept is not marginal but average. So I would like to introduce a somewhat bold assumption that in this process the change of average productivity always exactly reflects the change of marginal productivity, in other words, that the marginal-average-ratio of productivity is kept unchanged in each sector. Under this assumption, this equation can express conveniently the factor equilibrium process defined above.

Now, we will go on to the last issue, the problem of investment and saving. The economy as a whole is again assumed to be growing along the equilibrium path, by which we mean here that investment is always equal to saving. Paralleling the concepts used in the treatment of labor above, the growth rate of the economy will be expressed as the sum of the growth rate of the productivity of capital (h) and the growth rate of capital investment itself (k). Accordingly, we get the following simple relation: $G = h + k$. However, the substantial implication in this case is somewhat different from the case of labor. In the discussion of labor's case, the productivity change in the process of growth was of great importance, but here the so-called productivity of capital will not change so remarkably. This concept is the reciprocal of the well-known concept of capital coefficient or capital-output-ratio, and it has been generally recognized that the value of this ratio or coefficient is apt to remain nearly constant in the long run. Therefore, I think it is convenient here to assume that ratio is constant throughout the whole process, or $h = 0$. We then get $G = k$. Under this assumption the incremental value of capital-output-ratio is naturally equals to its average value, so that we can treat the investment-saving problems only on the incremental phase, using the well-known Harrod's type of formula, $GC = s$, where C and s stands respectively for the incremental capital-output-ratio and the average saving ratio. It should be noted here, however, that the meaning of capital-output-ratio is different from that of Harrod, because it is used here from the viewpoint of production-technique relation, not from the so-called acceleration principle concept.

Next, we want to develop the above fundamental relations of the growing economy as a whole into a two-sector case. If we denote the capital-output-ratios of agriculture and non-agriculture respectively by C_a and C_n , it will be possible to give the amount of investment required to maintain a given growth rate in each sector G_a and G_n respectively, which will be expressed by the terms $G_a C_a$ and $G_n C_n$. If the average savings' ratio in each sector is denoted by s_a and s_n respectively, then the following relationships develop:

$$G_a C_a = s_a + \alpha, \quad G_n C_n = s_n + \beta \quad (4)$$

In this equilibrium growth process, the relation $GC=s$ of the economy as a whole is always maintained according to the assumption given above. It does not follow that $G_a C_a=S_a$ or that $G_n C_n=S_n$ as a necessary result. Thus α and β are introduced of this assumption, to account for the disequilibrium between investment and saving which normally appears in each sector. It is to be noted that the relation $\alpha\omega=\beta(1-\omega)$ follows between the two terms α and β , ω being the weight of net product of the agricultural sector to the national net product. If $\alpha>0$ then necessarily $\beta<0$, and vice versa. In the former case, the amount of saving is insufficient to maintain that rate of investment required to maintain the growth rate G_a in the agricultural sector, and amount of saving realized in the non-agricultural sector is partially transmitted into the former sector, and in the latter case the reverse will be true. It is a simple matter to arrange the above relations into another set of equations, deleting α and β as follows;

$$\begin{aligned} \frac{s_a}{C_a} - G_a &= \left(\frac{G_n C_n - S_n}{C_a} \right) \frac{1-\omega}{\omega}, \\ G_n - \frac{s_n}{C_n} &= \left(\frac{s_a - G_a C_a}{C_n} \right) \frac{\omega}{1-\omega}. \end{aligned} \quad (5)$$

In the process of capitalistic development of the economy, the numerical values of these relations will be determined by the behavior of investment and saving. If the expected marginal efficiency of investment is smaller in agricultural sector than in non-agricultural sector in a certain stage, a part of the money saved in the former sector will flow out to the latter sector to be invested there, even though it may induce a products-disequilibrium. This is merely a description of one phase, but it will be enough to point out that a capital-equilibrium does not necessarily guarantee a products-equilibrium. The same is of course true concerning the case of labor-equilibrium. However, it might be not unuseful to point out some formal relations as follows.

It has been already made clear that $G_a < G_n$ in the products-equilibrium process. Hence on the simple assumptions of $C_n = C_a$ and $s_n = s_a$, the investment rate required to maintain the products-equilibrium process in agricultural sector ($G_a C_a$) is necessarily smaller than that of non-agricultural sector ($G_n C_n$), and savings in the agricultural sector can flow out to the non-agricultural sector. In such a case, agriculture may be called the sector which is playing a positive role in the economy. When the value of capital-output-ratio of agriculture is smaller than that of non-agricultural sector, the outflow just mentioned above will naturally become more remarkable. Anyway, in the early period of economic development of Japan, agriculture did certainly play the positive role. The reverse case is imaginable in which agriculture plays a negative role in the products-equilibrium process, depending on the numerical relationships between the

three terms mentioned above. Japanese agriculture at present is facing such a situation.

III. "*Over-Occupied*" condition and "*disguised*" equilibrium

It is to be noted that the characteristics of these three sorts of equilibrium processes explained above are different and that we should be careful to distinguish the one from the other when applying these theoretical models to the practical problems.

In this context, I think it will be useful to reconsider the implication of the classical treatment of the relevant subjects. As is well known, in the classical theory of economic growth the assumption of the so-called decreasing return tendency in the agricultural sector composes the essential core of the system. In our terminology, the decreasing return tendency may be expressed as follows; the increasing rate of labor productivity of agricultural sector is always apt to become smaller than that of non-agricultural sector, or in other words, the unequal increasing rate of labor productivity between the two sectors, namely, $g_n > g_a$ is assumed to continue throughout the growth process. Furthermore, the effect of this process is entirely considered in terms of the ever-rising tendency of the relative prices of agricultural products. This was natural and reasonable, because in that period the practical aim of the theory was to make clear the advantages of adopting free trade policy and of depending more and more on the foreign supply of agricultural products in order to meet the increasing domestic demand.

Most of the processes of capitalistic developments in the world have really followed along this line more or less. As the results of this sort of policy and of the agricultural developments in the new continents, the relative price of agricultural products has actually not risen so much, but remained nearly unchanged in the secular trend. In other words, the agricultural problems in the meaning of the classical school has been solved by developing international trade in the world. It was mainly because of this actual trend of relative constancy of agricultural prices that we have used real term models in the former section. However, it is to be noted that in the classical model there is no room to appear the factor disequilibrium problems between the two sectors. In that system, it is entirely assumed that the effect of increasing cost in the agricultural production is to be paid from the total profits of capitalists in the closed economy, as the results of the increasing tendency of rent on the one hand and of the rising trend of money wage rates on the other. It is obvious that the perfect equilibrium of capital and labor between the two sectors is fundamentally assumed in this model. Therefore, the classical

thought may be understood as relying entirely upon open system in regard to the means of solving the problem of unequal increasing rate of agricultural productivity.

The product-equilibrium is not necessarily needed if the economy is able to develop the open system favourably. I would like to observe a few points on this line. If a growing economy is inclined to depend more and more upon foreign supply to meet the increasing demand for agricultural products, it is obvious that its equilibrium growth rate of domestic agriculture will be smaller, and its growth rate of non-agricultural sector will be higher than in the case of closed system. In order to treat this point simply, it is convenient to assume constant terms of trade between the two kinds of products and the continued equilibrium balance of payments in foreign trade. Furthermore, if we assume that the value of imports of agricultural products is always just paid by the value of exports of non-agricultural products, then this process of the open economy may be formulated simply as follows;

$$D_a = a G_a + b G_t, \quad G_n = c D_n + d G_t,$$

where, D_a and D_n stands respectively for the growth rate of demand for agricultural products and that for non-agricultural one, and G_t the growth rate of foreign trade, and finally $a, b, c,$ and d stands respectively for the weights under the conditions of $a+b=1, c+d=1$. The above relations will be transformed to the more convenient forms as follows;

$$\frac{D_a}{G_a} = a + b \frac{G_t}{G_a}, \quad \frac{G_n}{D_n} = c + d \frac{G_t}{D_n} \quad (6)$$

which show the ratios of unequal growth rates of demand and supply in the two cases. Now, if these equations express the labor-equilibrium process as well as the products-equilibrium process, or in other words if the foreign trade expansion is going on just to cancel out the effect of the so-called decreasing return tendency in the agricultural sector, then we can get a happy growth process of the economy. In this case the equilibrium-difference of increasing rates of labor forces between the two sectors should be larger than that of the closed system, if other things are equal. Hence, we write as follows,

$$G'_n - G'_a = n'_n - n'_a \quad (7)$$

where, each prime stands for the case of open system.

Such a phenomenon, of course, might be caused by various situations, but I think, the following one is the most fundamental. According to the assumption of constant terms of trade, the value of imports and that of exports must be always equal to each other. However, as far as the domestic relation between the two sectors concerned, the rates of increasing labor productivity should not be the same. The latter should be considered as the sector of the so-called increasing return tendency, or in other words the increasing rate of labor productivity should be higher in this

sector than in agricultural sector. This is rather obvious when we remind of the comparative cost principle in the international trade. In this situation, the labor amount to be employed in the export sector would be necessarily less than the labor amount which would otherwise be employed in the agricultural sector in the case of no decreasing return tendency. If this is true, in order to attain the labor-equilibrium condition in the growth process, the growth rate of the economy with the tendency of decreasing return in agriculture must be higher than that of the economy without this tendency. Consequently, when the export sector can not expand by the rate required to fulfill the condition, there will occur a possibility of factor disequilibrium between the two sectors. There are, of course, various factors to be discussed concerning the possibility of expanding foreign trade, which we cannot treat here. But it may suffice for the time being to point out that it is almost impossible to attain the above mentioned required rate of expansion in a over-populated country like Japan.

In the classical system, the effect of insufficient expansion of trade is entirely considered by terms of rising tendency of relative prices of agricultural products, but in this context we have a fundamental problem of different nature. In brief, in a country like Japan the result is destined to appear not on the phase of product-prices, but on the phase of productivity-employment. The domestic price level of agricultural products can not be kept materially higher than the international level because of bringing unreasonable costs to the economy in various ways. Consequently the disequilibrium is destined to appear in the form of productivity-employment problem. And this problem does compose the most important issue of our subject.

In general, when the marginal productivity of labor in any one sector is always lower than its normal level of the economy, this sector is defined as being in the over-occupied condition with regard to labor force. The "*over-occupied*" condition means that the lower marginal productivity of labor is fundamentally caused by too-much occupation of labor force in this sector under the condition of decreasing marginal productivity curve, and that if the labor force occupied in this sector is reduced to a certain extent under the condition of no radical changes of production technique, the marginal productivity of labor will rise correspondingly to a certain extent. I said "always" in the above definition. This means that the phenomenon is not of cyclical, but of structural nature, or in other words that it will still exist even in the case of full utilisation of capital stock in the most prosperous time.

The well-known concept "disguised unemployment" has generally been used in the similar meaning. I think, however, it may be better to distinguish the concept defined above from this one by the reason that the former means the structural fact caused by the fundamental disequilibrium

on the growth process of the economy, while the latter rather specifies the peculiar condition of cyclical unemployment, which can be remedied by increasing effective demand. Besides, another concept "under-employment" has also been used to express similar situations, and disguised unemployment and under-employment has often been used interchangeably. But I think it may be better to make a clear distinction between these two terms, because the one expresses "unemployment" while the other says "employment". Unemployment and employment is quite a different matter to be distinguished from each other. If we use the concept of "unemployment" in the situation like Japan's case, we shall be obliged to "produce theoretically" a lot of unemployed people who themselves never think actually to be unemployed. This is of course an unreasonable setup. The concept of under-employment might be defined to be quite equal to the concept of over-occupation defined above and these two expressions might be used interchangeably. It is convenient, however, to use the latter to point out exactly the nature of the problem we are faced mainly by the two reasons; first, under-employment has often been used as quite a different meaning by the Keynesian terminology in order to express the condition of under-full-employment of the economy as a whole, and second, in our case most of the labor forces in agricultural sector are not employed by enterprisers, but occupy themselves in their own farm work, showing quite a different characteristics of demand-supply behavior of labor from the Western type of employment.

Now let us return to our two sectors' model. If the condition of equal increasing rate of labor productivity is not satisfied and $g_n > g_a$ appears in the process, then we certainly have the over-occupied condition in agricultural sector. In this case, the above defined "normal level" of marginal productivity of labor should be recognized to be that of non-agricultural sector, because in the over-populated countries like Japan the capitalistic productions have been introduced mainly in the non-agricultural sector and we are naturally used to have the standards of economic comparisons in this sector. As already analyzed in the former section, the most important factor which determines the labor occupied condition in agricultural sector is the increasing rate of employments in non-agricultural sector (n_n), if we assume the increasing rate of total labor supply remains unchanged. Now, it is to be assumed that the modern type of employment is only prevailing in non-agricultural sector, while in agricultural sector the so-called self-employment behavior is prevailing. Actually, the self-employment type is also prevailing in non-agricultural sector to a certain extent, but this is neglected for the time being to observe the matter purely. In the situation like this, the incremental increase of demand for labor is determined by the capitalistic behaviour in non-agricultural sector. When the amount of this demand is not sufficient to absorb the increasing

supply of labor, the residual labor force is obliged to remain in the household-production work in agricultural sector. Thus there appears the over-occupied condition in this sector as the residual phenomena.

To give a comprehensive explanation for the existence of over-occupied condition, it is necessary to explain the following two matters at least; first, the factor proportion problem, second, the problem of the minimum level of marginal productivity of labor. As it has recently been pointed out by some authors, the modern type of capitalistic production has rigid factor proportion relationship, while the type of agricultural production has relatively elastic factor proportion, so that the incremental increase of demand for labor in non-agricultural sector is apt to be limited on the process of modernization, while the residual labor mentioned above is apt to be absorbed to agricultural sector. But, there is, of course, a certain limit. If the over-occupied condition goes on over that limit, there will appear an unstable situation because of resulting too-poor level of income of farmer's family.

In the latter context, I would like to develop another phase of this subject. In the former section, I adopted the simple assumption that the marginal productivity of labor is equal to wage rate. If this is valid for the present situation, there will appear a great difference of wage level between the two sectors, and it is actually true in Japan. But we have only a small number of hired workers in agriculture, while the most typical "workers" are the independent farmers of the type already described in the first section. This is to be noticed here again. They get the so-called mixed income, composed of labor-income and non-labor-income. I would like to introduce a theoretical means of demarcation between these two kinds of income. In the perfect equilibrium condition in agricultural sector, we can assume that the marginal productivity of labor inputs of the farmer and his family members working on their own farm will be equal to the prevailing wage rates of hired labor. By this reason it may be reasonable to evaluate the labor inputs of farmers and their family members by the wage rates of the hired workers. The remained amount of their income, after deducting this estimated amount for the earnings of their own labor from the total income should be recognized as to be the non-wage income. For simplicity it may be assumed simply rent.

Now, we will take the border line case into consideration, in which farmers' mixed income, composed of wage income and non-wage income, is just equal to the workers' wage income in non-agricultural sector. In this case we can say that the income parity between the two groups and the productivity disparity between the two sectors are both prevailing at the same time under the consistent assumptions. From the viewpoint of resource allocations, we must recognize the existence of under-optimum condition, while from the viewpoint of labor market, we must admit the

existence of a sort of equilibrium condition, so that this situation should be understood as being of double characters. I would like to define that there exists a condition of "*disguised equilibrium*" between the two sectors of the economy, by the reason that the situation should be considered as disguising the fundamental production disequilibrium behind the income equilibrium condition.

In the process of capitalistic development in a country like Japan, there remains still a lot of small proprietors who and whose family members are working by themselves, holding small amounts of production means of their own. Farmers holding a bit of land of their own are the most typical of these small proprietors. Their economic status are not uniform, ranging from relatively higher ones to quite low ones. It is, however, not unrealistic to assume that they are almost competing with normal workers at large in earning their income. And particularly, the post-war improved status of farmers explained in the first section is the realistic background on which the above-defined concept of disguised equilibrium stands.

If the amount of their mixed income is above (or under) the prevailing wage income of normal workers, the condition may be called as standing over (or under) the disguised equilibrium. It is to be noted that even in the case of over-disguised equilibrium, there does exist the situation of over-occupied, as far as there remains a condition of under-normal marginal productivity of labor.

These considerations will furthermore reveal that the accustomed concepts are not appropriately applied to the phenomena we call attention here, because it became clear that the under-normal productivity of labor does not necessarily mean the existence of any sort of unemployment problem or of the condition to be remedied within a short period by the particular measures. In the economic situation of a country like Japan, it is absolutely impossible to get an equal productivity condition between the two sectors by short period measures, and therefore from the practical point of view, the sustained maintenance of the disguised equilibrium condition should be a reasonable objective. Since the disguised equilibrium itself theoretically means a sort of labor equilibrium, the so-called full employment condition in a short term sense will be attained even in a country like Japan, though it is in a certain modified sense, because the full employment should be understood as involves a disequilibrium condition of production factors in this case.

In conclusion, I would like to mention the following four points.

(1) The over-occupied condition of labor in agricultural sector is inevitable, because the required growth rate of the economy and the required increasing rate of employment demand in non-agricultural sector in order to attain the factor-equilibrium condition is estimated too big to be realized.

(2) There are possibilities to attain and maintain both the product-equilibrium and disguised labor-equilibrium by developing the growth process of open system.

(3) In order to fulfill this conditions required, the equal increasing rate of productivity between the two sectors is necessary hereafter, under the assumption that the labors' relative share in non-agricultural sector will remain unchanged.

(4) In order to maintain the equal increasing rate of productivity under the pressure of present big increasing rate of labor force, the following three main measures will be most important—*a*) the speeding up of the growth rate of non-agricultural sector at least to the extent that the population occupied in agriculture will begin and continue to decrease slightly, *b*) the introduction of improved production technique into the agricultural sector to raise its labor productivity, and *c*) the particular measures for inducing more investments for agriculture, which is necessary even if this sector become to play a "negative role" in the investment-saving relation.