Economic Growth in the Pre-modern Society: An Analysis of the Downward Phase

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[Abstract]

In this paper we study the mechanism of economic growth of the pre-modern society. First, we have derived one of required conditions for the sustainability of the social division of labor between agriculture and industry. The required condition is expressed as a relation between four economic variables: annual harvest per peasant, the minimum food requirements for one's existence, the population ratio of craftsmen to peasants, and that of seigniors to peasants. Second, we have applied the required condition to the analysis of the downward phase of economic growth in the pre-modern society. The downward phase of economic growth is characterized as a period in which the rise in annual harvest per peasant, with declining population, continues and at the same time the balance between the supply of and the demand for farm produce tends to be restored gradually.

Keywords: population growth, the social division of labor between agriculture and industry, population ratio

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1. Introduction

The societies proceeding to the Industrial Revolution or industrialization are generally called pre-modern societies. In this paper we study the mechanism of economic growth of the pre-modern society.

Estimating and analyzing the long-term statistics of Gross Domestic Product (GDP) and population in Western European countries, US, and Japan, S. Kuznets found out that, in these countries, since Industrial Revolution, GDP per capita has remarkably increased. He considered that the persistent rise in per capita income characterizes the economic growth of modern societies, and termed the growth process with this characteristic modern economic growth[1)]. In contrast with modern economic growth, per capita income rose at a rather slower pace in pre-modern societies. In fact, many empirical studies, initiated by Kuznets and continued by other researchers, have verified that in Western European countries, before the Industrial Revolution, the rate of increase in their total product barely exceeds the rate of population growth[2)], and have also confirmed that in the developing countries, where, at the early stage of development, agricultural products, along with other necessaries of life, produced by individual farm households, constituted the largest portion of total product, increased productive capacity was fully absorbed by population, with no uptrend in per capita income[3)]. At present, it is well established that the growth process in pre-modern societies noticeably differs from modern economic growth, with roughly steady per capita income in the former compared with persistently rising per capita income in the latter. Then, if

it is the case, what is the mechanism which controls the process of economic expansion in pre-modern societies? No doubt a mechanism of economic growth quite distinct from that in modern societies must work there.

In comparison with empirical studies in abundance, we do not have so many theoretical studies exploring the process of economic growth in pre-modern societies up to the present. The model presented by D.W. Jorgenson, a well-known pioneer in the dualism approach, is one of a few valuable contributions to the present theme, among other research works. In preparation for the analysis of the industrialization process, he discussed the societies prior to industrialization, that is to say pre-modern societies in our sense, and formulated the mechanism of economic growth working in these societies. According to him, in the pre-modern society agricultural activities dominated the total production and were subject to diminishing returns to scale. In that case, he stated, if the rate of population growth is an increasing function of agricultural output per head, in so far as reproduction is below its physiological maximum, per capita output in the society tends to be constant in the long run[4)] .

Surely, it is not wrong that agricultural activities dominated the total production in the pre-modern society, and in addition, it is also true that agricultural production often exhibits diminishing returns to scale. The pre-modern society, however, is not merely an economy in which agricultural production has great importance but the economy with its own social structure, in which its members build up particular economic relations around productive activities; in the study of economic activities of the

pre-modern society, we can not ignore its economic structure. In this context, we should regard the growth process of the pre-modern society not as a direct result of technical improvements in agricultural production but as a complex outcome of the interactions of individuals behaving on the basis of the particular economic structure. Then, how is the economic structure of the pre-modern society built up?

In so many pre-modern societies, it is well-known that, seigniors, or feudal lords exerted their influences over certain areas and consequently there existed "the rule over land", in which a lot of peasants living in the areas came under the influence of their lords. In the previous works we have found that “the rule over land” is formed against the background of the particular economic structure, and called this structure the seigniorial system[5]. The results of these studies are summarized as follows. When agricultural production possesses great uncertainties and industrial production depends on highly skilled labor, the social division of labor is made between agriculture and industry. As a matter of fact, peasants are in charge of agricultural production and craftsmen industrial production, and at least a portion of one’s product is exchanged for the other. Besides, in the society where uncertainties in agricultural production are so great, the interference of the third party, seigniors, is a prerequisite for the uninterrupted exchange of products between peasants and craftsmen. In particular, the seignior obliges the peasants living in surrounding areas to surrender him a portion of their agricultural products and hands out parts of agricultural products thus obtained to his neighboring craftsmen. Thus, a large number of peasants are kept under the strong influence of

their lords; “the rule over land” is firmly established in the economic structure of the pre-modern society.

From the rough sketch of the seigniorial system just presented, we easily come to understand that as regards the social division of labor between agriculture and industry, some mutual economic relations are formed among seigniors, peasants, and craftsmen, and the relations among economic agents constitute the particular economic structure of the seigniorial system, on the basis of which economic activities in the pre-modern society are carried out. Needless to say, economic growth in the pre-modern society proceeds in this particular structure. The purpose of this paper is to explore the mechanism of economic growth in the pre-modern society, sufficiently taking this particular structure into account.

In the following section, we will theoretically examine the mechanism of economic growth, constructing a simple model, and, in section 3, will attempt to verify the theoretical conclusions, referring to a historical case.

2. Mechanism of economic growth

The pre-modern society is not a society without fluctuation duplicating its economic activities at the same scale all the time. Even in pre-modern societies, economic expansion or contraction may happen, and the economy beats its own rhythm. In this section, focusing attention on the period in which economic activities in general contract, we will theoretically investigate what mechanism sets off economic recessions in the pre-modern society. The theory of the seigniorial system has already made clear the

economic agents constituting the system and their interrelations and has defined the economic structure of the seigniorial system. Then, it may be quite natural to go a step further to study the economic expansion and contraction in the pre-modern society in the light of the theory of the seigniorial system. Taking it for granted that the economic structure of the seigniorial system is firmly established, and paying attention to the changes in the interrelations among economic agents, we will attempt to account for the downward phase of economic growth in the pre-modern society.

First of all, let's make a brief review of the economic structure of the seigniorial system. In pre-modern societies, labor productivity is generally so low that one spends a great deal of efforts in securing natural resources. Consequently agriculture in a wide sense becomes the major sector of the economy. Although industrial production, in which natural resources thus obtained are processed further, is surely not absent at all, its relative weight is rather little. In addition, as a similar reflection of low productivity in labor, the annual harvest varies from year to year and much uncertainty characterizes agricultural production. On the other hand, a great part of industrial production depends on manual labor, which in some cases requires sophisticated manual skills.

Since his devotion to job for a long time is indispensable for acquiring sophisticated skills in certain industrial processes, an artisan becomes a specialist in several industrial sectors. In other words, in the pre-modern society, in accordance with its particular production technology, the social division of labor between agriculture and industry is inevitable; peasants

are engaged in the production of agricultural goods as well as that of industrial products requiring no special skilled labor, and craftsmen are engaged in that of industrial products requiring highly skilled labor. Then, while peasants are in need of industrial products which, indispensable though they are for productive activities and daily consumption, the peasants, nevertheless, can not produce by themselves, craftsmen devote themselves so assiduously to industrial work in their own specialties that they can not supply themselves with sufficient food. Between peasants and craftsmen, one party being in need of the other's products, an exchange of their products will naturally set out. The social division of labor between agriculture and industry necessarily encourages the exchange of farm produce and industrial products. Because of much uncertainty in agricultural production, however, the exchange can not be brought under the complete control of the free will of the producers concerned; Only through the intervention of the third party does the exchange between farm produce and industrial products proceed smoothly, and the seignior is exactly the third party who intervenes the exchange.

The three economic agents constituting the seigniorial system, i.e., peasants, craftsmen, and seigniors, play their crucial roles in maintaining the social division of labor between agriculture and industry, but at the same time their existence is sustained by that division of labor. In fact, while, through the social division of labor, peasants obtain some industrial products whose production is beyond their capacity, craftsmen and seigniors obtain farm produce which is apt to be deficient or is sometimes completely deficient, in the same way. Now, we will make a closer exami-

nation as to the supply and demand of farm produce[6] below.

Model analyses are conducted under seemingly unrealistic assumptions. These assumptions, however, are more often than not very helpful, because, by means of them, putting aside some irrelevant conditions which do merely complicate problems, we can concentrate on the very nature of problems. In this paper below, for example, we will assume that everyone must take at least a certain amount of food C per annum in order to survive. It is true that actually the minimum food requirements for existence varies with the individuals, but, even if we take such differences between individuals into account, the problems of the whole society come to barely give the appearance of being more complex and do not become easier to solve at all.

While the peasant produces a certain amount of farm products X a year on average, the craftsman produces a smaller amount of farm products uX, where the parameter u represents any number between 0 and 1. Because his working hours in the fields are far shorter than those of the peasant, the craftsman can not products as a large amount of farm produce as the peasant. As previously stated, the farm produce thus obtained falls short of the amount required for existence and the craftsman can not sustain his existence solely by his work in the fields. The situation can be succinctly expressed by an inequality between the amount of farm produce harvested every year by the craftsman uX and the minimum food requirements for existence C,

$$uX < C \qquad [1]$$

Further, let ℓ, m, and n be the number of seigniors, peasants, and

craftsmen respectively. Then the total agricultural production per annum in the society amounts to

$$mX + nuX.$$

On the other hand, suppose that both the peasant and the craftsman are satisfied with the minimum food requirements for existence C and that the food consumption of the seignior vC is v times, where $v > 1$, greater than that of either the peasant or the craftsman, then the aggregate demand of farm produce in the society will be equal to

$$mC + nC + \ell vC.$$

As a matter of fact, since a portion of agricultural products may be either kept for sowing or put into industrial production, the aggregate demand of agricultural products should include both replacement demands and new investment in agricultural and industrial production. We will, however, omit these components for the sake of the simplicity of the analysis. Strictly speaking, it is quite correct to state that the omission of new investment in agricultural and industrial production in particular confines the analysis, for the time being, to the steady state of the economy with no variation in productive capacity and population.

As we have already suggested, for the seigniorial system to continue working, an equality of supply and demand must hold for agricultural products,

$$mX + nuX = mC + nC + \ell vC.$$

Rearranging, we get

$$X - C = \frac{n}{m}(C - uX) + \frac{\ell}{m} \cdot vC. \qquad [2]$$

This equality shows us one of the requirements for the persistence of the seigniorial economy, which should be met by the four economic variables: annual harvests per peasant X, annual food consumption per person C, the population ratio of craftsmen to peasants n/m, and that of seigniors to peasants ℓ/m. The left-hand side of the equality represents the amount of farm produce which the peasant household can supply to outside, and the right-hand side the amount of farm produce which both the seignior and craftsman can expect from outside. In view of the inequality [1], it is obvious that the right-hand side of the equality [2] is positive, and, as far as the equality [2] holds good, we have

$$X > C,$$

which implies that agricultural surplus in the hands of the peasant is indispensable for the persistence of the social division of labor between agriculture and industry.

The four variables in the equality [2] find their values under circumstances of their own. The amount of minimum food requirements for existence C depends primarily on biological conditions. We have been able to assume safely the amount to be constant for this reason. Annual harvest per peasant X, surely the product of annual working hours of the peasant and annual harvest per hour, is determined, his working hours being taken to be fairly constant, solely by annual harvest per hour and, we find, chiefly depends on technological conditions of agricultural production. On the other hand, both the population ratio of craftsmen to peasants n/m and that of seigniors to peasants ℓ/m are not variables directly affected by natural factors. The two population ratios depend on family

institutions, inheritance systems, population dynamics among social strata, the apprentice system of craftsmen and so on; these factors are more social or institutional than natural. To sum up, the value of each one of the four economic variables is determined by its own factors, different in its nature. Furthermore, from the fact that the amount of the minimum food requirements for existence C does not vary greatly, as well as taking into account the circumstances in which, in pre-modern societies, it is not easy to control annual harvest per peasant X, we can infer that at a particular point in time, the values of these two variables being given, the other two variables depends on these.

If annual harvest per peasant X rises, with other conditions kept constant, the population ratio of seigniors to peasants ℓ/m also rises. Similarly, if annual harvest per peasant X rises, with other conditions kept constant, the population ratio of craftsmen to peasants n/m also rises, As agricultural production by peasant expands and the supply of farm produce for seigniors and craftsmen increases, one peasant can support more and more seigniors and craftsmen on average. It is true that with the rise of agricultural production in general, annual harvest per craftsmen uX also increases, but unless craftsmen become self-sufficient in food, in other words, in so far as the equality [1] holds good, there is no decline in the population ratio of craftsmen to peasants n/m. The fact that both the population ratio of seigniors to peasants ℓ/m and that of craftsmen to peasants n/m vary with annual harvest per peasant X clearly demonstrates that the physical existence of the seignior and the craftsman have been sustained by agricultural work of the peasant. In fact, a fertile re-

gion with abundant harvest per annum reached the social division of labour and brought forth a highly stratified society comprising many noblemen, military leaders, government officials, and priests, not to mention craftsmen.

The persistence of the seigniorial system requires a certain quantitative relation between, at a glance, mutually independent economic variables such as harvest in agriculture and the population ratios between economic agents. Nevertheless, in reality, this quantitative relation does not always hold good. In particular, changes in the environment produce different effects on the four variables constituting the equality of supply and demand for agricultural products and may threaten the equality. Now, suppose that some conditions in agricultural production deteriorate for some reason or other; unless annual working hours of the peasant increase, annual harvest per peasant X declines. Then, if, regardless of the decline in annual harvest per peasant X, both the population ratio of craftsmen to peasants n/m and that of seigniors to peasants ℓ/m remain constant, the left-hand side will be smaller than the right-hand side in the equality [2]. The equality [2] turns into

$$X - C < \frac{n}{m}(C - uX) + \frac{\ell}{m} \cdot vC \qquad [3]$$

Needless to say, we have assumed that the minimum food requirements C remain constant.

If the supply of farm produce falls short of the demand for that, food crises may happen. Moreover, with frequent food crises, famines and epidemic diseases may break out and spread throughout the country, taking a

heavy toll of human lives. Population must continue to decline, so far as the inequality [3] indicating a shortage of food supply holds good. Therefore, it is naturally considered that the inequality [3] represents an economic situation in a period of population decline.

Various incidences may trigger off a deterioration in conditions in production; in reality, bad weather, widespread livestock diseases, or war and conflicts, any caused serious damage to arable cultivation and animal husbandry. The more fundamental factor, however, is population increase, which, it is argued, usually aggravated the damage already done by these incidences and in some cases became a remote cause for some of them. Population increase resulted in an expansion of arable fields with a higher proportion of arable cultivation and animal husbandry, but, on the other hand, uncultivated areas such as forests and heath were forced to retreat with a decline of hunting and gathering, which complemented arable cultivation and animal husbandry in the pre-modern society. Agricultural production in a broad sense is composed of these two elements in good balance, but if a rapid expansion of arable cultivation and animal husbandry disturbs the balance, the expansion will have a harmful influence on agricultural production in general comprising arable cultivation and animal husbandry as well as hunting and gathering. Therefore it is considered that a deterioration in conditions in agricultural production happens against the background of the destruction of the balance, accompanied by population increase, between arable cultivation and animal husbandry on the one hand and hunting and gathering on the other.

If it is the case that population increase has brought about a deteriora-

tion in conditions in production through various channels, by extension we can naturally expect that population decrease, conversely, will work to bring conditions in production back to a former state. In other words, if population increase brings down annual harvest per peasant X, population decrease must bring it up. Noting the inequality [3] again, we find that a rise in annual harvest per peasant X implies both an increase in the left-hand side in the inequality [3] and a decrease in the right-hand side. Although, the left-hand side being smaller than the right-hand side, the inequality still holds, the left-hand side rises and the right-hand side falls; therefore the difference between the former and the latter gets smaller. That is, although the supply of farm produce remains short of the demand, a shortage of farm produce is gradually alleviated and the balance between supply and demand tends to be redressed. The downward phase of economic growth in the pre-modern society, characterized by population decline, is the process in which the imbalance between the supply of and the demand for farm produce, caused by a deterioration in conditions in agricultural production, tends to be reduced.

A considerable portion of farm produce is extracted from peasants in various forms of labor services and tributes, and a significant quantity of industrial products are transferred to peasants without entering into market transactions. Some agricultural and industrial products, however, are traded at the market, which, nevertheless, is often under the control of seigniorial authorities. Suppose that a certain portion α of farm produce mX in the society and a certain portion β of industrial products nY as well are traded at the market[7]. Besides, we assume that the peas-

ants as a whole sell the farm surplus αmX at a certain price p_x and earn cash incomes $p_X \alpha mX$. These are the only cash incomes that the peasants obtain, and moreover, it is assumed, the peasants spend the whole income in buying industrial products on the market βnY at a certain price p_y. Then adding up the equalities of income and expenditure for individual peasants, we get the equality for the peasantry,

$$p_X \cdot \alpha mX = p_Y \cdot \beta nY. \qquad [4]$$

Similarly, suppose that, as regards the craftsmen, they sell industrial products βnY to obtain the funds necessary for the purchase of the farm produce αmX, and that they spend all the funds thus raised, then we have, only by transposing the income and expenditure in the expression [4], exactly the same equality of income and expenditure for craftsmen as the equality [4]. This equality can be transformed into

$$\frac{p_X}{p_Y} = \frac{\beta}{\alpha} \cdot \frac{m}{n} \cdot \frac{Y}{X}. \qquad [5]$$

The relative price between farm produce and industrial products in the left-hand side is determined by the five variables in the right-hand side: the ratio β of the sale of industrial products to their total output, the ratio α of the sale of farm produce to its total output, the population ratio of craftsmen to peasants n/m, industrial products per craftsman Y, and annual harvest per peasant X. Because, as a matter of fact, the seignior not only sells at the market a variety of crops grown in the demesne but also purchases industrial products, market transaction by the seignior must have some influence on the trends in the relative price; but for the sake of simplicity we overlook this influence at the moment.

We have already made an assumption that, in the period of population decline, annual harvest per peasant X rises and the population ratio between craftsmen and peasants n/m remains unchanged. Moreover, we will consider that industrial products per craftsman Y are little affected by population changes. Under these assumptions above, out of the three factors in the right-hand side of equality [5], two, i.e. the factor β/α concerning the ratio of the amounts traded to total production for each product and the population ratio n/m, are constant, and only the last factor, the ratio between two products Y/X is likely to change and falls. Consequently, we find that the relative price p_X/p_Y in the left-hand side falls.

3. A historical instance

In the preceding section we have stated that, when the three economic variables, i.e. annual harvest per peasant X, the population ratio of seigniors to peasants ℓ/m, and that of craftsmen to peasants n/m, stand in a certain relation, population decline will set in in the pre-modern society. Then, in the light of historical instances in pre-modern societies can we uphold this theoretical hypothesis? In particular, did the actual movements of the economic variables in the period of population decline conform to those expected?

The period and place referred to in this section is Europe in the Middle Ages. So far, in preparation for a theoretical study of the pre-modern society, the author has referred to, in addition to Europe in the Middle Ages, Latin America countries before agrarian reforms and the Indian subconti-

nent before the independence and partition of India and Pakistan. Though, because of a deficiency of numerical data, we, this time, have failed to mention the experiences of these two regions as historical instances.

The economic development in medieval Europe is broadly divided into two phases. The first phase is the period of economic growth ranging from the eleventh to the fourteenth century, and the second phase is the period of economic contraction stretching over the whole fourteenth century and the most part of the fifteenth century[8]. Between them, we will pay special attention to the second phase.

The expansion of arable lands beginning at the tenth century and reaching its zenith throughout Europe between the twelfth and the thirteenth century[9], the settlement of forests and marshlands and the formation of new villages promoted and pushed forward through the effort of peasant pioneers, feudal lords and the monastic orders[10], vigorous colonial activities in vast areas covering the whole region between the Elbe and the Oder, the tract to the east of the Oder, and, farther afield, the Scandinavian Peninsula[11], and the foundation of new towns as well as the extension of the main urban area[12], all these are a manifestation of population increase; A population increase continued all over Europe from the eleventh century to the middle of the thirteenth century[13]. Beyond the middle of this century, however, many obstacles to further expansions gradually mainfested themselves in England and France[14], and a population in every corner of Western Europe reached a ceiling between the early thirteenth century and the beginning of the fourteenth century[15]. It is immediately after that that such calamities as arable failures, and

epidemic diseases befell the population. From the end of the thirteenth century on, one serious setback in agriculture followed another in England; in particular, during the opening few decades of the fourteenth century, crop failures in 1315, 1316, and 1321 and the widespread livestock disease of 1319-21 badly shook agricultural production[16]. Agricultural crises after 1300, though, are not restricted to England. In north-western Europe, after the consecutive failures in grain production from 1314 to 1316 severe famine broke out in towns and cities including those in the Flanders region, which depended on outside for food provisions, and claimed many human lives[17]. In addition, in the 1330s food crisis also broke in Catalonia and in High Provence[18]. Famines advance the spread of infectious diseases through malnutrition, impairment in immunity, and the intake of rotten food[19]. In reality, in 1348, following a series of disasters including bad weather, crop failure, and soaring prices, the Black Death broke out and spread all over Western Europe; also, in Italy, after the famine of 1374-75, an epidemic disease prevailed[20]. In Western Europe, since the Black Death of 1348, over half a century, an outbreak of epidemic disease of different kinds had repeated itself from every ten years to fifteen years[21]. Consequently, by the cumulative effects of agricultural crises, famines, epidemic diseases as well as war, plunder, and rampant illegality as far-reaching consequences of economic crises[22], population began to decline greatly after the fourteenth century. Confronted by a series of difficulties, many people stopped cultivation, left farmland in ruins, and abandoned the villages where they had long lived[23]. According to an estimate, the Black Death alone claimed about

one-third of the total population of Western Europe and, all the disasters and wars being counted, the victims amount to two-thirds of the total population of Western Europe[24]. Population decrease, after that, continued into the first half of the fifteenth century in advanced regions and throughout this century in less advanced regions. Nevertheless, population in various regions never declined without interruption[25]. In Eastern Normandy, although a downward trend of population continued from 1348 to the middle of the fifteenth century, in this interval roughly two temporal reversals of the trend were seen[26].

Anyway, in the second phase of the economic development on which we will focus, the population of Western Europe, after attaining a high stable level, tended to decline continuously. In this period of population decline in medieval Europe, what values were assumed by the three economic variables; annual harvest per peasant X, the population ratio of seigniors to peasants ℓ/m, and the population ratio of craftsmen to peasants n/m? And how did these three variables change?

First of all, as to annual harvest per peasant, there is hardly anything to disclose its absolute level. Although, surely, in certain regions, some estimates of farm produce were attempted from account books as well as leases conducted at the time tithes were farmed out[27], without the peasant population of the concerned regions we can not find annual harvest per peasant.

We can, however, catch a glimpse of its direction of change, knowing whether harvest is good or bad, or knowing whether arable land is going to expand or contract. From the end of the thirteenth century to the be-

ginning of the fourteenth century, that is, in the period in which the population had stabilized at a high level, as we have already stated, agricultural depressions continued throughout Western Europe. Although land reclamation went on well into the latter half of the thirteenth century, the productivity of the freshly cleared land was low and unstable[28]. Besides, the expansion of arable land, at the expense of pasture and forest, was so great as to threaten the basis of medieval agriculture which rested on both the balance and the harmony between arable cultivation and animal husbandry on the one hand and hunting and gathering on the other[29]. A series of facts suggest that agricultural productivity had a falling tendency in this period. On the other hand, from the middle of the fourteenth century to the fifteenth century, while population were declining, we find a gradual amelioration of agricultural production. In fact, it is true that, as stated above, many people, with a decline in population, were obliged to retreat from their ancestral farmland and dwellings, but the farmland thus abandoned was generally inferior in productivity and also, by concentrating their cultivation on more fertile lands, they attained higher productivity in agricultural production in general[30].

Second, how well are we informed about the population ratio of craftsmen to peasants? If we have the relative shares of peasants, craftsmen, and seigniors in the total population of the country or a region of the country, we can immediately figure out the population ratio of craftsmen to peasants. Up to the present, however, no data on the relative shares is available.

Then, if it is very difficult to estimate the population ratio of craftsmen

to peasants directly, is it possible to find any other approximate indices substituting for this? The first that occurs to us will be the ratio of urban population to rural population in the region. While, in many cases, towns were centers of industry and commerce in the region, where many craftsmen were engaged in their occupation, the countryside was a scene of agricultural production more than anything else, where peasants are considered to form the most part of the population. Supposing that the population of craftsmen and that of peasants roughly in the region corresponded with its urban and rural population respectively, we can regard the ratio of urban population to rural population in the region as a proxy variable for the population ratio of craftsmen to peasants, which we can not obtain directly.

As at least 10% of the total population were townsfolk in the early fourteenth-century England[31], European urban population, from the twelfth to the fifteenth century, did not exceed 10% of the total population, except for a few regions such as the Netherlands and Northern Italy, where urbanization was especially remarkable[32]. Nevertheless, urbanization in every place proceeded without any doubt. While the total population in 1328 was at least twice as great as that in 1000 in France, urban population increased at by far greater speed to triple over the same period[33]. Also in England, since 1086, urban population had increased at a little greater speed than rural population for two centuries or so[34]. Besides, as we have already mentioned, it was in this period that the founding of new towns went on in many regions in Western Europe. From these facts, we conjecture that, during the period of the continuous popu-

lation growth in Western Europe, the ratio of urban population to rural population exhibited a rising, yet slightly, tendency. Subsequently, the fourteenth century opening, the growth in urban population came to a halt almost everywhere and was not resumed until the sixteenth century[35]. Nevertheless, the decrease in rural population was also so significant that we are not certain about which direction, upward or downward, the movement of the ratio of urban population to rural population followed.

Thus we know some facts on the ratio of urban population to rural population. But, again, we should be aware that the ratio of urban population to rural population is no more than a very crude approximation to the population ratio of craftsmen to peasants, first because, even peasants, not to mention lay seigniors, clergymen, and merchants, living within the city walls, townsfolk not necessarily mean craftsmen, and second because we can not neglect the presence of the craftsmen in the village and in the manorial center.

In the preceding section, we have conjectured that, first, annual harvest per peasant rose and, second, the population ratio of craftsmen to peasants remained almost constant over the period of population decline. Within the range of empirical studies which we have examined so far, there is no strong evidence against these two conjectures. Moreover, in the preceding section, from two addition assumptions we have inferred the fall in the price of farm produce relative to that of industrial products, which almost coincide with the results of empirical studies. In fact, after the fourteenth century, a long-term decline in the price of agricultural products set in not only in Normandy but also in England[36]; From the

Black Death to about 1410, the price of farm produce remained at a low level throughout Western Europe except for years of famines, epidemic diseases, or wars[37]. On the other hand, the price of industrial products, in general, showed neither falling nor stagnant tendencies[38]; even if there was a decline in industrial price in some regions, its extent was not greater than agricultural price. Therefore, we concluded that in many cases, from the second half of the fourteenth century on, the relative price between farm produce and industrial products went on falling[39].

Finally which way did the population ratio of seigniors to peasants move? Since, as stated above, no data on the relative shares of peasants, craftsmen, and seigniors in the total population has survived, we can not know the population ratio directly; besides, no suitable proxy variable readily occurs to us. Thus, we will restrict ourselves to point out two factors affecting the population ratio in the period of population decline. First, the seigniory with large holdings of property enjoying high standard of living, even confronted by economic difficulties, had much higher possibilities to overcome them than the peasantry. In fact, as an instance in early fourteenth-century Flanders showed, agricultural crises did no noticeable harm to the seigniory, who had laid up provisions in normal times, but did enormous harm, claiming many victims, to the urban poor, who suffered from starvation caused by a sudden rise in grain prices[40]. Besides, the destitute people were, in general, vulnerable to epidemic diseases because of malnutrition[41]. Moreover, the fact that, in Medieval England in its prime, the life expectancy of the youth in his twenties is estimated to be less than fifty years for the nobleman and not to reach

even forty years for one in the lower strata of the society[42], will also reflect the gap in death rates between the rich and the poor. Second, the succession to property in noble families may be restricted to part of their descendants, as in the case of inheritance to the eldest son. Thus, even if the seigniory boasted a higher birth rate than the lower strata of the society, the population of seigniors grew at a speed lower than the birth rate[43]. The first factor will contribute to bring the population ratio of seigniors to peasants up and the second factor will contribute to bring it down.

4. Conclusion

In this paper, from the theory of the seigniorial system we have derived one of required conditions for the sustainability of the social division of labor between agriculture and industry, which we have applied to the analysis of the downward phase of economic growth in the pre-modern society. In section 2, we have advanced some theoretical hypotheses, which we have attempted to verify in section 3.

To begin with, let's sum up the principle results of the theoretical studies. First, we have derived one of required conditions for the sustainability of the social division of labor between agriculture and industry. The required condition is expressed as a relation between four economic variables: annual harvest per peasant, the minimum food requirements for one's existence, the population ratio of craftsmen to peasants, and that of seigniors to peasants. Second, we have applied the required condition to the analysis of the downward phase of economic growth in the pre-modern

society. In the recession phase of economic activities, annual harvest per peasant being less than annual demand for food per peasant determined by the three other economic variables, a shortage of food supplies results in. Through a population decline caused by food shortages, annual harvest per peasant will begin to rise sooner or later. The downward phase of economic growth is a period in which the rise in annual harvest per peasant, with declining population, continues and at the same time the balance between the supply of and the demand for farm produce tends to be restored gradually. Moreover, we can confirm that, with some addition conditions, the relative price between farm produce and industrial products goes on falling in this phase.

In section 3, we have attempted to verify the hypotheses theoretically formed. As regards propositions about all pre-modern societies in which " the rule over land " prevailed, it is theoretically possible to verify them in any pre-modern societies satisfying the condition. But, in practice, for lack of necessary numerical data that remain as well as from insufficiency of its analysis and compilation, we can attempt to verify the hypotheses barely in a few pre-modern societies. Nevertheless, even in medieval Europe, one of few pre-modern societies eligible for our studies, we can not obtain any data helpful in verifying directly our hypotheses, such as annual harvest per peasant, the population ratio of craftsmen to peasants, and that of seigniors to peasants. For this reasons, as for these economic variables, in this paper we have restricted ourselves to showing some indirect evidences suggesting their absolute levels or their directions of change. So far as empirical studies are concerned, our attainments, being

far from a verification of our hypotheses, merely have suggested a direction of future researches at the very most. If, however, a lack of an acute consciousness of theoretical problems is one of the contributing factors in preventing the development of empirical studies, our presentation of the theoretical hypotheses in this paper will be by no means in vain.

Note:

1)Kuznets[1973], pp.166-169.

2)Kuznets[1973], p.166, Maddison[1991], pp.1-5, p.48, Maddison[2001], p.17, p.27.

3)Reynolds[1983], p.943, pp.947-948.

4)Jorgenson[1961], pp.311-318.

5)We have given a theoretical presentation of the seigniorial system in Sekine[2000], whose main conclusions will be briefly reviewed below.

6)Farm produce is not necessarily provided for craftsmen and seigniors through market transaction. In fact, in pre-modern societies, the amount of farm produce supplied and demanded in the market remains a modest portion of total agricultural production.

7)Or else, even if, relaxing this assumption slightly, we suppose that the ratio β/α between these two portions is constant, the conclusion below remains unchanged.

8)Postan[1951],pp.226-227, Postan[1973],pp.4-6.

9)Duby[1977a],p.148, p.175, Ganshof and Verhulst[1966],pp.291-292, Miller and Hatcher[1978],p.xiv.

10)Duby[1977a],pp.160-161, pp.167-168.

11)Fourquin[1990],pp.101-102, p.228.

12)Fourquin[1990],pp.101-102, Miller and Hatcher[1987],p.70, Miller and Hatcher[1995],pp.270-271, Le Goff[1980],pp.193-194.

13)Cipolla et al.[1951],p.58, Duby[1977a],p.217.

14)Duby[1977a],p.223.

15)Herlihy[1985],pp.141-142, Cipolla et al.[1951],p.68.

16)Bailey[1998],p.223, Kershaw[1973],pp.16-20, pp.24-26, p.29.

17)Fourquin[1990],p.246, Van Wervèke[1959],pp.5-10,p.14.

18)Fourquin[1990],p.250.

19)Fourquin[1990],p.250, Van Wervèke[1959],p.12.

20)Carpentier[1962],p.1078.

21)Carpentier[1962],pp.1080-1082.

22)Duby[1977b],pp.179-182, Fourquin[1990],pp.254-255, Kershaw[1973],pp.12-13.

23)Postan[1951],p.233, Duby[1977b],pp.186-188, Fourquin[1990],p.251.

24)Herlihy[1985],p.142.

25)Herlihy[1985],p.143, Duby[1977b],pp.185-186, Bloch[1968],p.19.

26)Bois[1981],pp.52-62.

27)Bois[1981],pp.111-112, Fourquin[1990],pp.234-235.

28)Miller and Hatcher[1978],pp.55-57.

29)Miller and Hatcher[1978],pp.99-100, p.155.

30)Fourquin[1990],p.251, p.271, Duby[1977b],p.197, pp.243-245.

31)Miller and Hatcher[1995],p.278.

32)Pirenne[1969],pp.51-52, Cipolla et al.[1951],p.66.

33)Le Goff[1980],p.189.

34)Miller and Hatcher[1995],p.278.

35)Pirenne[1969],pp.148-149.

36)Miller and Hatcher[1978],p.245, Bois[1981],pp.76-77.

37)Fourquin[1990],pp.247-248, Duby[1977b],pp.189-191.

38)Postan[1951],p.231, Fourquin[1990],p.247.

39)Fourquin[1990],pp.247-250, Bois[1981],pp.80-84.

40)Van Wervèke[1959],pp.9-11.

41)Fourquin[1990],p.250, p.254.

42)Miller and Hatcher[1995],pp.viii-ix.

43)Duby[1977b],pp.27-28, Herlihy[1985],p.144.

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