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『農業と経済成長—日本の経験』

Kazushi Ohkawa, Bruce F. Johnston, Hiromitsu Kaneda, ed., *Agriculture and Economic Growth: Japan's Experience*. Tokyo, Tokyo University Press, 1969. xxii, 433p.

Economists constantly turn to Japan in the search for empirical support of hypotheses concerning economic growth. In Japan self-sustaining economic growth began later, and experienced its highly accelerated phase later than in most currently high income nations. Likewise the process has clearly progressed further in Japan than in most currently low income nations. In addition the man-land ratio, other aspects of resource endowment, and cultural conditions of Japan are often thought to be more representative of current low income nations than those of the nations of Western Europe and North America. In recent years considerable interest has also focussed on the experience of Taiwan, thought to have much in common with the Japanese model, and in a somewhat different resource context, the cases of Mexico and Iran. Nevertheless Japan remains as the most interesting and most referred to development model. The detailed statistical data available for a long span of development activity and the painstaking analysis of numerous Japanese scholars has further increased reference to the Japanese model.

The Japanese case has been of particular importance in controversy respecting intersectoral relations between agriculture and non-agriculture. The flow of finances and physical resources from agriculture to other sectors has entered into the controversy between Johnston and myself on the one hand and Schultz on the other with respect to agriculture's role in capital formation. The flow of labor from agriculture, the supply elasticity of labor with respect to price and changes in the absolute size of the agricultural labor

force have been important questions in the controversy involving Lewis, Fei, Ranis and Jorgenson with respect to development models. Discussion of the means of developing agriculture through emphasis on the processes of technological change and the role and mechanisms of agricultural research, by myself and others draws heavily on the Japanese experience. More recently Johnston has reexamined questions of the economics of demographic patterns as they relate to food balances and employment problems using the Japanese experience as a taking off point. On each of these questions there has been controversy as to the facts and the implications of Japanese experience.

This book on Japan's experience with respect to agriculture and economic growth brings together authoritative evidence on each of these questions as well as a wealth of data and ideas relevant to other important aspects of economic development. The bulk of the papers were discussed at a major symposium held in Tokyo in the summer of 1967. The topics for the papers were carefully chosen to provide wide breadth of coverage, minimum overlap, and intensive treatment to areas of important controversy. Thirteen of the sixteen papers are by Japanese scholars, itself an important feature to American and European economists who have received much of their information on the Japanese economy from other European and American scholars. Several of the papers have previously been published elsewhere, reflecting an effort to bring to bear the most authoritative statements on important issues. Reflecting the same concern, three papers are included which were not presented at the symposium. The result is certainly one of the most well-rounded, useful and interesting books on economic development—including a great deal of statistical data intelligently organized around important questions of economic theory and development policy. The excellent quality of the papers is no doubt the product of critical discussion at the symposium and rigorous efforts of the co-editors of the book.

With so many excellent papers on such a diversity of topics, it is not practical to summarise each paper in order in this review. Therefore I will organize my comments not around the individual papers, but

around a series of substantive questions of particular relevance to current thought on economic development. An excellent, very brief, summary is provided by the co-editors in their preface and what is in effect a more extensive review of the material is given in an excellent first chapter by Kazushi Ohkawa. The whole set of papers are best read in the context of Bruce Johnston's perceptive discussion of the relevance of the Japanese model to contemporary developing nations, in which he gives particular emphasis to demographic contrasts and uses those to argue that the extraordinarily difficult demographic problem of currently low income countries gives added relevance to growth in agricultural production through yield increasing biological innovation, low capital intensity agricultural development and substantial contribution of agriculture to formation of non-farm jobs through provision of financial and physical resources—all of which are well illustrated by the Japanese case.

A substantial proportion of this book deals with the question of labor supply from agriculture for industrial development and the related question of the "turning point" with respect to the supply of agricultural labor. It is clear from well documented presentations by Mataji Umemura, Arlon Tussing and Ryoshin Minami that sustained rapid growth occurred in the manufacturing labor force with very little rise in real wage rates. Rapid growth in the industrial labor force was possible despite relatively slow population growth and little or no decline in the agricultural labor force because of the initial high proportion of the labor force in agriculture. While industry thus experienced a highly elastic supply of labor, with relatively constant real wages for a considerable period of time, real annual family earnings increased with increased employment per worker and an increased proportion of the family working. Side occupations and part-time farming are shown as increasingly important throughout the development process. Thus rising real incomes and welfare are consistent with an elastic supply of labor.

The growing importance with development of non-farm incomes in the lower income part of the rural population is consistent with evidence from

India reported by Mellor *et al* in *Developing Rural India* and indicates the close interrelation between agriculture and non-agriculture and the difficulty of distinguishing income flows between the sectors.

The papers are consistent in placing a "turning point" with respect to labor supply in the mid to late 1950's. Minami shows the elasticity of labor supply to the capitalist sector rising from around one or less prior to 1960, to over three after 1960; marginal productivity of labor in agriculture rising slowly prior to 1950 and rapidly after 1950; low correlation of wage rate and marginal productivity in the pre World War II period; and the real wage rate in agriculture essentially constant up to 1950's and then rising at five percent per year. These results are confirmed by Keizo Tsuchiya's study of power tillers for which there has been tremendous increase since the late 1950's. That study confirms that decisions concerning use of power tillers are consistent with the economic environment, which is near perfect with respect to labor and machinery hire, and that power tillers are basically labor saving instruments with little direct effect on yields. Shujiro Sawada indicates elsewhere that power tillers probably do a poorer job of plowing and hence may depress yields slightly.

Yukio Masui's analysis of the supply price of labor and Takeo Misawa's analysis of part-time farming show the labor market in Japan working very well with changes in wage ratios between sectors consistent with changing job composition, composition of the labor force and other factors (Masui) and part-time farming increasing over time and defining nearly 80 percent of all farms by 1965 (Misawa). Misawa also shows income per capita and consumption patterns similar for farm and non-farm laborers and for different sizes of farms, off farm laboring being the prime factor in equalization.

Two different chapters deal with agriculture's contribution to financial and capital resources of the non-agricultural sectors. Gustav Ranis documents the very large proportion of government revenues from agriculture in the early years of rapid development and Kenzo Hemmi details the substantial role of silk in both foreign exchange earnings and agricultural growth. From 1921-25 to 1926-30 sericulture provided

16 percent of the total value of agricultural production; from 1916-20 to 1921-23 30 percent of the increase in value of agricultural production came from sericulture: in the whole period 1868 to 1930 silk and related goods accounted for 42% of merchandise exports and 38 percent to the growth in merchandise exports. What is demonstrated of course is the opportunism of success stories in economic growth. Japan used the potential from silk to build the rest of its economy so as to minimize the effects of loss of position to other fibers rather than using the problem of synthetics as an excuse for development failure. Indeed with respect to the drain on agriculture and the supply of foreign exchange, the resources were effectively used to ferment development processes which greatly benefitted the rural population as well as the urban population.

Related to the question of agriculture's financial and resource contribution to other sectors is the question of whether that contribution came primarily from an income depressing squeeze or from increments to production arising from efficiency increasing technological change. Controversy on this question developed from James Nakamura's high estimates of production in the Meiji base period from which he concluded that the rate of growth of output was much lower than previously estimated. The detailed analysis of production data by Yuji Hayami and Saburo Yamada, careful study of data on technological change by Shujiro Sawada, and analysis of consumption data by Hiromitsu Kaneda all confirm that rates of productivity growth were indeed substantial, although perhaps not as sharply different to other countries as had once been supposed. Thus we find that agriculture's capacity to contribute to other sectors growth was indeed enhanced by the growth in efficiency through technological change. Its capacity to do this of course also depended on the fact that the sharply growing capital needs of agriculture accompanying technological change were met in substantial part by high rates of saving from increments to rural income. Tsutomu Noda deals with a series of complexities in analyzing time series and cross-section data with respect to savings and demonstrates very high marginal propensities to save of

around 0.5. The marginal propensity to save is much higher for farm households than other and for the agricultural component of family income than for the non-agricultural component. Presumably the marginal propensity to save in agriculture is high because the returns are high due to the effect of technological change. Recent studies in India show similarly very high marginal propensities to save in those situations in which technological change has sharply raised marginal returns to capital above the very low stagnant levels of traditional agriculture.

Thus we have a wealth of information on the attainments of Japanese agriculture and its intersectoral relations. There is much less on how Japanese agriculture was able to achieve this success. Sawada's chapter gives us substantial information on the relative importance of various factors in achieving increased production; Yuzuru Kato analyzes the role of long term credit; and Shigeto Kawano concludes that the post World War II land reform contributed little to productivity increase and had other disadvantages. But we find little concerning such things as how research and education developed, how farmers were organized for production increase and the relative roles of self-financing and borrowings for expanded working capital.

With greater understanding of the processes which accelerate the aggregate growth rate, attention is turning now to the interrelations of various growth processes and the distribution of income. The Japanese case is of particular importance in this respect and the volume being reviewed provides several pieces of information relevant to his question.

Clearly the structure of the industrial sector affects the relative demand for labor and capital and indirectly the division of income between various income groups. It would appear that Japan, using agriculture as a leading edge obtained an initial structure of demand and then of industrial production weighted substantially towards lighter consumer goods industries which provide a lot of employment relative to capital requirements. This in turn provides a wide distribution of income. Japan emphasized heavy industry later in its development than India, for

example. Ohkawa's observation of the relationship between rates of growth in agriculture and industry is of particular interest in this respect. In the post World War I period, industrial structure moved towards heavy industry, presumably providing a slower rate of growth of employment relative to growth in capital, and hence less rapid growth in demand for agricultural commodities. Conversely the lower growth rate in agriculture provided a lower growth rate in demand for output from the high employment component light consumer goods industries. With growth in heavy industry, average wage rates rose sharply, but this is not nearly as effective in raising demand for food as the broadening of employment which accompanies expansion of lighter industries. Johnston's paper quotes work of Saburo Okita's which points out the relation between structure and income distribution and includes the revealing fact that as late as 1956 nearly half the manufacturing labor force in Japan was in enterprises employing less than 30 persons.

Kaneda's paper showing the relative stability of food consumption patterns over a long period of time is consistent with the view that Japanese industrial development, oriented towards light consumer goods and broad diffusion of employment, pulled consumption patterns away from what are normally high income elasticity of demand for agricultural commodities. In this respect it would be revealing to see what happened to the relative prices of rice on the one hand and fruits, vegetable and livestock products on the other hand—rapidly rising relative prices of the latter would suggest that stability of food consumption patterns was due to production or marketing bottlenecks rather than competing industrial consumer goods as suggested above.

It is apparent from the papers in this book that there is a wealth of data available with respect to wage rates and labor earnings. It would be useful to relate this more directly to the changing structure of the economy not only between agriculture and industry, but within the industrial sector as well—further relating changes in agriculture to changes in industrial structure. These analyses might suggest an interesting anomaly—that the faster the rate of growth of agricul-

tural production the faster the decline in the proportion of the population in agriculture. The relationship described would be due to rapid growth in agricultural production pushing demand structure towards industries using a lot of labor relative to capital and agriculture readily releasing labor from its surplus or eventually through low capital using mechanization.

In conclusion, this collection of papers tells us a great deal about a development process which includes and is consistent with a technologically dynamic agricultural sector. This is of course not the only possible model of development. It may be however the most desirable model on the grounds of its rapid growth in and wide distribution of employment and hence of income. Perhaps the next round of research can tell us more of these relationships and how to achieve broadly based growth processes which particularly enhance incomes of the lower income laboring classes of rural and urban areas.

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