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Technology Transfer from Advanced to Developing Countries (2)

by Katsu Yanaihara

(3) The range of technological choice

Even if we assume that the ordinary isoquant diagram exists, the range of choosable technology is problematical. Although some empirical studies have been made, the results are just as inconclusive. Non-continuous process industries like the construction and textile industries may have a wide range in the choice of technology, while continuous process industries like the chemical industry may not have an alternative technology. If the substitution of production factors is not elastic, the choice of industry for direct investment necessarily determines the technology. On the other hand, in the case of high elasticity of substitution, after the choice of the type of industry has been made, a further step to choose the appropriate or optimum technology is needed.

(4) The distortion in the ratio of factor rewards

This ratio can be simply defined as the ratio of the wage-rate and the rental of capital. There are many possibilities in developing economies that the actual ratio of factor rewards does not reflect their real factor endowments.

Labour: Most developing countries have dual economies, a traditional, rural sector, and a modern, money sector to which export industries belong. It can be safely assumed that modern industries, both for domestic and foreign markets, are located in the latter. As many developing countries were once colonies of Western powers, the thought and system of a welfare state has easily been transplanted. Administrative rules and regulations for labourers in factories are established and trade unions were also organized, while the economy was still in a premature stage of development, consequently the wage-rate or the price of labour in the modern sector is apt to be kept higher than the shadow price which would be set in a labour market. Moreover, as the government sector usually occupies a major part in the modern sector, and they often decide their own wage-rate, the stipend of government officials dominates the wage-rate in the rest of the sector.

The adult male labour force will flow into the modern sector from the rural area, but they will first enter the pool of unemployment or at best, the informal sector, and then for a few years they will have to wait for the opportunity to get job in the formal sector where the wage-rate is considerably higher. The existence of mass unemployment in the labour force does not press down the prevailing wage-rate in general.

Capital: The actual rate of interest does not reflect the true opportunity cost in developing countries, because the government sometimes adopts preferential tax systems on foreign investment for inducing capital import.

Foreign firms will finance their capital not in host but in home countries where the rate of interest is low due to the abundance of capital endowments.

Capital goods: Most of the capital goods which are necessary for modern direct investment factories must be imported from advanced countries. Aid is often tied to the capital goods but not to labour.

(5) The short run and long run problem

In the long-run, capital intensive technology will realize higher rates of absorption of labour as well as higher rates of growth of output.

(6) The other reasons for adoption of over-capital intensive technology

- (a) Technology is researched and developed in advanced countries where it has the tendency to be capital intensive owing to their factor endowments.
- (b) Government in developing countries sometimes also prefer modern, capital intensive technology because of the prestige involved.
- (c) Tested technology in advanced countries are less risky than new ones.
- (d) Engineering instinct of demanding better and better quality prefers modern, automatic technology in order to assure the high quality of products.
- (e) From the stand-point of management, labour saving technology is preferred, because of the difficulty in controlling labourers whose cultural habits are not familiar to the management of home countries.

III The dissatisfaction at technology transfer expressed in developing countries

(1) Over-capital intensity of technology transferred

- (a) It does not have enough effect on creating employment.
- (b) Import-substitution effect is small.
- (c) Learning effect and diffusion of technology are limited.

(2) Over-pricing of technology

- (a) The price of technology per se is unduly high.
- (b) Import prices of capital and intermediate goods are also unduly high.
- (3) Modern technology adopted by direct investment firms will form enclaves and further intensify the duality of the society.
- (4) Main interests of multinational corporations are not in promoting economic development in host countries.

IV Concluding remarks: Technology policies in developing countries

- (1) The possibility of correcting the distortion in factor rewards by utilizing aid.

- (2) Creating eligible labour by leveling up its standard by national education and training.
 - (3) Widening the range of technology by developing indigenous technology.
 - (4) To extend another activities to investment for absorbing unemployment in parallel with adopting optimum technology which can realize maximum output.
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Regional Income Accounting of Mitajiri Saiban in Mid-Nineteenth Century Chōshū, Part I

by Shunsaku Nishikawa
and Shōko Ishibe

Bōchō Fudo Chūshin-an is an extraordinary detailed socio-economic survey of the fief of Chōshū *han* (clan), located at the south-western end of Honshū (Island). (Now the area is Yamaguchi prefecture.) The survey was conducted on *mura* (village) basis, and renumerated the quantitative, as well as descriptive, informations on geography, soil and other natural resources, output, input, taxes, consumption, and even the way of life of the villagers. These data were as of the early 1840's, and some flow informations such as crop yield were the averages over a few preceding years.

The fief was subdivided into 17 *saiban* (or *saihan*), which were the local administrative and jurisdictional district in Chōshū-*han*. Mitajiri *saiban*, now the city of Hōfu, was one of them and located at the coast side of Seto Inland-sea. (See the Map in the text.) It consisted of 2 *machi* (towns) and 29 *mura* (villages), a few of which were the villages where the inhabitants, including a number of in-migrant workers from neighboring *mura*, and near-by and distant *saiban*, for example Ōshima, engaged exclusively in salt production. It had a port and had been a center of commercial and industrial development in the fief since the preceding century. Number of inhabitants was about 32 thousand and average family size was nearly 4. Cultivated land was some 3.8 thousand *chō* and assigned (i.e. tax-basis) agricultural output was 60 thousand *hoku* in terms of rice. We intends in this paper to estimate the regional income by industry, expenditures, and saving in Mitajiri *saiban* as a whole, using these data.

The first part of the paper is largely devoted to estimate agricultural output by kind, cost of production consisted of purchased fertilizer, feeding and depreciation cost of cattles, and expenditure on cultivating tools, and taxes. The estimates are all measured in terms of local *han* currency called *satsugin* or *han-satsu*. Ratio of total taxes over agricultural output was roughly 40%, and agricultural income after taxes in the almost *mura* hardly covered the subsistence or food consumption which used to be computed about 1~1.5 *hoku* per head in terms of cereal

other than rice. Non-food expenditure was estimated by the *mura yakunin* (village official appointed among wealthy farmers) on his own casual experience. Taking non-food expenditure into account, the balance between agricultural revenue and, cost and consumption was definitely negative in every *mura* in the district, whereas other *saiban*, for instance Mine, which was located at hillside area, there remained some amount of agricultural produce. However no significant non-agricultural job opportunities were existed, and the farmers sold remained products in order to get their non-food necessities. In Mitajiri on the contrary the deficit was generally filled up by income originated from non-agricultural activities such as salt production, cotton weaving, and so on. Moreover the gain from them gave some substantial residual that amounted 20~25% of total income in the district. After estimating non-agricultural income, whether this residual is to be regarded as saving or not will be examined in the sequel.