IV-32   STRUCTURAL CHANGES IN THE ECONOMY RESULTING FROM DIRECT INVESTMENT BY FOREIGN FIRMS --SOME CONCEPTUAL INSIGHTS--

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1. BACKGROUND AND OBJECTIVES

This research comprises a section of the paper " A World Trade Model " which is being developed to estimate future cargo demand of ports in Japan. The variables which influence volume of international trade are as follows:
1) Direct investment by foreign firms
2) Increased production cost caused by a wage increase
3) Trade control policies such as various import barriers
4) Fluctuation of exchange rate of currency
Focus of this paper will be on the first item.

One purpose of direct investment in a foreign country is to generate profit by getting a larger share of the market, establishing a constant source of imported goods and realizing an effective way to use operation resources. Foreign direct investment changes the economic structure of a country in terms of the balance of payment and international trade and production structures of domestic industries; and the social environment in the form of employment/unemployment.

2. DISCUSSION OF THE EFFECTS OF DIRECT INVESTMENT ON INDUSTRIES

1) An effect on the balance of payment and international trade
The investments for "develop and export" projects, "projects for import substitution", and "projects for export promotion" all contribute to increasing foreign exchange by increasing export and/or reducing import. The project in a sort of free trade zone might be more effective owing to non-hindrance. However, as a developing country has a comparatively simple industrial structure, a newly established industry will have to import most of its raw materials for production (intermediate input). This might reduce the trade surplus of the project.
2) An effect on the production structures of domestic industries
An industry, except factories which engage only in the assembly of imported parts, located in a developing country will procure some kind of intermediate input from the country. This procurement will stimulate the growth of related industries. In order to enjoy this kind of indirect effect, many countries have regulations to reduce the amount of imported parts vis-a-vis domestic ones. This means that direct investment by a foreign firm will contribute to the growth of many industrial sectors as well as the said industrial sector. On the other hand, even if the main purpose of direct investment is import substitution or export promotion, an industry sector which produces the same kind of commodity will be affected adversely by the new firm without regulation for compulsory export.
3) An effect on the social environment such as employment/ unemployment
Increase of employment is sometimes the main reason for inviting foreign investment. If foreign companies employ only unskilled labor, their investment shouldn't create economic problems. On the other hand, because there are a few skilled labor resources in developing countries in general, employment of skilled labor can create a problem by increasing the wage rate. A foreign company usually can pay more than a domestic one thereby creating a shortage problem of skilled labor for the domestic industry. Although an increase in wages contributes to the national welfare it also contributes to the decline of export industries.

3. ANALYTICAL ASPECTS AND DATA LIMITATION

The world trade model mentioned above comprises 23 countries. Available data on these countries necessary for model building is quite limited. Data sources include input-output tables, statistical year books or economic statistics, and the annual publications of Japan Export and Trade Organization (JETRO). The effects of direct investment on both input structure and output usage within the system of input-output table will be considered first. The other effects which cannot be captured in the input-output scheme will be considered in the econometrics model.

4. ANALYTICAL SCHEME OF THE EFFECT OF DIRECT INVESTMENT

4.1 INVESTMENT IN A PRIMARY INDUSTRY

As a firm tends to invest in the specialized field of industry of a foreign country, "develop and export" projects are very popular in primary industries. Most of the additional produce by the project can be considered to be exported (cannot be used in domestic market). Therefore, the production structure in this industry sector after investment should be the weighted mean of the traditional domestic structure and that added by the project.

$$X_j = \sum_i x_{ij} + \sum_k v_{kj} \qquad \text{--------------------(1)}$$

$$x_{ij} = {'}x_{ij} + \Delta x_{ij}, v_{ij} = {'}v_{ij} + \Delta v_{ij} \text{ --------------------(2)}$$

where, X_j : joint production amount of industry j
x_{ij}, v_{ij} : input structure and value added structure of industry j
${'}x_{ij}, {'}v_{ij}$: expected structure of input and value added without project
$\Delta x_{ij}, \Delta v_{ij}$: additional input and value added by the project

4.2 INVESTMENT IN A MANUFACTURING INDUSTRY

In the case of a complete knockdown factory, a structural change of input and value added is the same as that of the primary industry. Additional inputs are then cancelled by the importation of corresponding commodities. In the case of a complete import substitution project, output usage does not change except import of raw materials. When a company procures some part of its raw materials, such as parts, the estimation procedure is as follows:

1) Intermediate demand of the company is divided into domestic procurement amount and import amount using the procurement ratio converter.

2) The structural change of production ΔX can be estimated by equation (3)

$$\Delta X = (I - A + M) - 1 \Delta f \qquad \text{---------------------(3)}$$

where, Δf : procurement amount from domestic market
I,A,M : unit matrix, technical coefficient, and import coefficient respectively

Additional import amount can be calculated using ΔX and M. A negative effect on the domestic market by this commodity is also calculated by equation (3) making Δf_j negative. Most probable and difficult effect is estimation of an additional direct investment related to the initial investment. If a required additional input ΔX_i is significantly large compared to the existing production level X_i, then, possibility of additional investment may be quite high. This additional investment cannot be captured in an input-output table system. An econometrics scheme or independent sub-model has to be formulated. Amount of additional investment Δx_i might be a function of the additional demand ΔX_i, relative demand to an existing production level $\Delta X_i/X_i$, wage rate w, and etc..

$$\Delta x_i = f(\Delta X_i, \Delta X_i/X_i, w, \dots) \qquad \text{---------------------(4)}$$

4.3 INVESTMENT IN A TERTIARY INDUSTRY

Although the effect of the establishment of a tertiary industry, such as a shopping center, is significant, it is very difficult to estimate its effect quantitatively. The reasons are as follows:

1) Although an expansion of effective demand can be explained by Keynes theory, the basic demand should be a function of level of income.

2) The input structure of a commercial industry is composed of commercial margins and is completely different from that of manufacturing.

3) A demand change caused by location of a foreign commercial industry may influence the qualitative aspect of consumption. Therefore, this change can be considered a substitution of goods within the same industrial sector.

Taking these reasons into account, we can omit this kind of investment when dealing with structural change of industry.

5. CONCLUSION

This paper discussed the effects of direct investment on the economic structure and the applicable analytical methodologies. The discussion here is neither very deep nor very comprehensive. However, it is expected that new findings and/or new problems will present themselves after analyzing real data based on the concepts in this paper.