Ch.3 On the Combined Use of the International Industrial Statistics and Trade Statistics

Chapter 3

On the Combined Use of the International Industrial Statistics and Trade Statistics

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The economies of not only developed countries but also developing countries have been changing drastically after 1970. Continuous appreciation of the yen value requires at first cost saving efforts to Japan's exporters and recently to shift their factories outside the nation. The Asian NIES and the ASEAN countries grow so rapidly and continuously that they are called as "the growth center of the World." The export encouraging policy of these nations is an important factor for the rapid growth. Direct investments of the developed countries and imports demand of the developed countries are also other factors. Direct investments build new factories and increase the production capacities in the developing countries. Import demands of developed countries make it possible to export the products made in the developing countries. The increased export induces production of that sector, and the increase in production replaces the demand of own import. So the industrial structure and the trade structure in one country are closely related. We should analyze the growth of the developing countries on this view point. It is necessary to compile the database of the industrial statistics and the trade statistics in the consistent way for such purposes.

The Industrial Statistics Yearbook of UN, and the Industrial Structure Statistics of OECD, and The OECD STAN DATABASE for Industrial Analysis are compiled to capture the industrial structure of each nation, respectively. The Yearbook of International Trade Statistics of the UN, and the Statistics of Foreign Trade of OECD are to describe the trade structure of each nation. Their classification code systems are different. The ISIC system is used for the industrial statistics, and the SITC is used for the trade statistics. Each code system has been revised by now respectively. So it is very difficult to give the one-to-one correspondence for all codes systematically. In this paper, we will examine three topics on the combined use of the international industrial statistics and trade statistics of the UN.

1. A Classification Problem

The classification code systems are not the same, then some standardization is required for the combined use of both statistics. Here we will attempt to make a common classification table between ISIC and SITC. The table does not give the complete one-to-one correspondences for all basic codes, but gives the information to integrate each data to 20 sectors that are defined in Kinoshita and Yamada(1982).

We can get the information about the relation between the classification used in Japanese Input-Output Tables and ISIC code system. This table shows the relation of the basic classification code of the Input-output table to 4 digit code of ISIC, which are not complete in the sense that they all do not have one-to-one correspondences.

At first, we define 20 sectors using Input-output classification in Japan. They consist of the Agriculture, forestry and fishery, the Mining, and 18 sectors of Manufacturing. We can make a correspondence table between these 20 sectors and ISIC 4 digit codes. Only 11 of the codes in ISIC 4 digit are cited repeatedly. For these codes, we define one-to-one

correspondence to 20 sectors using 6 digit codes of ISIC. Then we can get a complete correspondence table between 20 sectoral classification and ISIC code system in mainly 4 digit and partially 6 digit.

We can refer a conversion table between ISIC and SITC in Industrial Statistics Yearbook. It shows that some ISIC codes in 6 digit correspond to another group of SITC codes in 5 digit. Here via ISIC 4 digit codes, we connect the SITC 4 digit code to the classification with 20 sectors, which we defined. About 80 percentage of SITC 4 digit codes are linked to one of 20 sectors respectively, and the rest are not. In the SITC revised 2, 79 codes are cited in more than two sectors. But 66 of them are automatically defined the connection, when all ISIC codes are linked to each of 20 sectors partially using ISIC 6 digit codes. They have one-to-one correspondences between SITC 5 digit code and ISIC 6 digit code. And 11 codes have a feature that 5 digit codes of them are connected to two or more codes of ISIC 6 digit. We determine one-to-one correspondences among them respectively. Only two codes of 5 digit SITC are related to a couple of sectors, which are not solved using the lower digit codes. We give arbitrarily one-to-one correspondence for these two codes. Then we can get a complete table, but the correspondence relation in the Agriculture, forestry, and fishery is omitted, because there is no information about them originally.

Though some arbitrariness is included in our judgement, and some relations are not resolved, we can get the conversion tables between Input-Output base 20 sectors and ISIC codes, and between Input-output base 20 sectors and SITC codes, in relatively easy way.

2. Data Consistency in the Two Statistics

Second, we compile the industrial data and trade data of 20 sectors for two Asian NIES countries and five ASEAN countries; Korea, Hong Kong, Singapore, Malaysia, Indonesia, the Philippines, and Thailand. They are countries and region that are called the "Growth Center of the World." We examine the consistency between the data. Production and export and import are observed from two statistics. We can calculate domestic demand by adding the value of production and import then subtracting export from the summed value. If the calculated value is negative, then we can find the inconsistency in the sectoral data. We also compute four indicators; the domestic supply ratio, the import coefficient, the export-output ratio, and the domestic demand ratio, in sectoral base. These indicators should be all positive, and some should be less than one. The export-output ratio and the import coefficient should not be close to one usually. We can also check the data consistency by observing these indicators.

Observing the compiled data, we find that there is no inconsistency between production and trade at least in the manufacturing total. But we also find some sectors have negative domestic demand. These sectors are the leather products, the miscellaneous manufacturing, for example. The data in some sectors are not reported originally, for example the petroleum and coal product in Indonesia. No data before 1982 are reported in Thailand. Though there are such difficulties in compiling sectoral data of production and trade, we can observe the feature of their economic development.

Korea grew rapidly after 1975 in its production, and the domestic supply ratio was increased. In Korea, exports of the light industries like the textile and the apparel grew at first in 1970's. After 1980, the heavy industries and machinery industries started to increase their exports. The economic structure of Hong Kong and Singapore is quite different from those of other countries. Their economies depend heavily on the international trade. They export and

import commodities comparing with the scale of their production and domestic demand.

ASEAN countries like Indonesia, Malaysia and the Philippines exported their natural resources and related commodities like wood and rubber products mainly at first. After 1980, they increased the production and export of the food products, the textile, the apparel, and so on. Recently products in the machinery sectors are increasing. Their economies are firmly changing to their structure from depending heavily on the light industries to relying on machinery industries. We can get the data of Thailand for 1982, 1984, and 1986. So we cannot observe long tendency of its economy, but the recent structure seams to be the same as the other ASEAN countries.

3. An export oriented development model

Third, we estimate a simple model that explains an export oriented development in East Asian counties. The model consists of five equations; export function, import function, export price function, product price function, and labor productivity function. We estimate these equations for two counties; Korea and Indonesia. The former is a representative of Asian NIES and the latter is that of ASEAN countries. Data for the estimation are compiled by 20 sectors from 1970 to 1987. The model describes the causal relation that capital accumulation improves the labor productivity, and increased labor productivity strengthens own price competitiveness in the world market, and increase export volumes. This causal relation is consistent with the export oriented economic development.

We expect significant estimation for the industries that successfully increase their production and export. In Korea, almost all industries, which export much of their products to the world market, are significantly explained by our model, but some are not. For example, export-output ratio in the apparel has positive relation to the term of trade. The product price in the steal industry is not explained by its own unit labor cost. Though there are some exceptions, export growth in Korea can be well explained by our model.

The leading industries of Indonesia in production and export are the mining and the petroleum and coal. But we omit the estimation for them, because their data are not reported originally. The export-output ratios in both the textile and the wood product are positively related to the term of trade, contrary to our expectation. The results of our estimation for Indonesia are not so good as those of Korea. Indonesia started to grow its own economy later than Korea, and many industries have just started to increase their production at least in our sample periods.

Economic development requires changes in not only internal industrial structure but also international trade structure, which would be observed from the data of the UN international statistics. East Asian countries and regions are called as "the Growth Center of the World," and it is expected to investigate why their economies grow so rapidity and successively. These empirical studies require the complete and consistent data about the production and international trade. We think that the International Industrial Statistics and the International Trade Statistics of the UN are good sources for such studies.

We find the followings. First, though these two statistics are classified by different code systems; ISIC and SITC, it is possible to compile data in the consistent manner that links both codes, at least for relatively high integrated classification with 20 sectors.

We compile the data of production and international trade for seven East Asian countries, and check the data consistency between them. We find that data from the international industrial statistics

are consistent to those from the international trade statistics for total manufacturing, and for many sectors of manufacturing. But some sectors have inconsistency between the production values and trade values, one reason of which is that we compile the data by simple and relatively incomplete classification.

We estimated a model that explains why exports increase in many East Asian countries and regions. We explain that the capital accumulation including foreign investment strengthens the labor productivity, which lower product price and export price, then the reduced price induces high competitiveness in the world market, and increases export. We apply our model to Korea and Indonesia. Almost all industries in Korea are estimated significantly, but those of Indonesia are not so good as Korea.

The international Industrial Statistics seams one of the useful sources for the empirical analysis of developing economies. But we should be careful in using this statistics, because some sectoral data in this statistics are sometimes including other sectors, and not all sectoral data are reported in each country, which depend on reporting countries. Our analysis in this paper is tentative. The successive research is required to build a complete database that synthesizes both statistics and to develop a more systematic econometric model to capture the economic development of East Asian, which remains in our future efforts.