Preface

The Subjects of Compilation and Application for Trade Indices

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This chapter provides an overview of SDS No. 93 titled *Trade Indices and Change of Trade Structure*. It introduces the history and the outcomes to date of the IDE's formulation and use of trade statistics, and surveys the improvement of trade data, the consistency of the data and the correction of its consistency to the greatest degree possible, the formulation and evaluation of trade indices, and international comparisons and analyses of trade value indices and related indices. The research group conducting one of the IDE's long-term research projects, "Compilation and Application of Trade Indices (IV)," was formed in April 2007 to formulate trade indices and conduct international comparative analyses and other analyses based on these indices from the perspective of the improvement of world trade data and the use of trade data. This volume compiles some of the research outcomes produced by this study group. Focusing on the countries and regions of East Asia and the US, it considers issues of the formulation of trade data and the evaluation of their consistency in Part 1, issues of the formulation and evaluation of trade indices in Part 2, and offers international comparisons and analyses based on trade indices and related indices in Part 3.

The trade data employed by the study group is drawn from the UN Commodity Trade Statistics Database ("UN Comtrade" below). In formulating trade indices it is essential to ensure consistency in both the transaction values and quantities in trade data as long-term time series. The employment of the trade indices and related indices which have been formulated in international comparisons and analyses further highlights issues of consistency and validity and other problems. The evaluation of the consistency of trade data using long-term time series is the most fundamental and important issue for the "Compilation and Application of Trade Indices (IV)" study group. Prior to developing competence in the use of the basic data forming the foundation of the project, several of the members of the study group had participated in other study groups focusing on the improvement of trade data, the evaluation of the consistency of transaction values by comparison of imports and exports based on the double recording of trade data, a special characteristic of this data, and the evaluation of world trade matrices. Naturally, members also improved trade data, corrected its consistency, and worked with the data in other ways outside the study group, in daily duties, providing trade data search services, and during commissioned research. These experiences built the foundation of the present study group. Among the other study groups, the "World Trade Statistical Data and Retrieval Systems," "Consistency of Commodity Trade Statistics for APEC

Countries and Regions," "Estimation and Evaluation of Trade Indices," "Compilation and Application of Trade Indices (II)," and "Compilation and Application of Trade Indices (III)" study groups can be pointed to in particular. Some of the research outcomes of these groups have been published as survey research reports and in the Statistical Data Series.

The research outcomes of these study groups and their processing of trade-related data crystallized three research issues for the present study group, as set out below:

(1) Improvement of long-term time series trade statistical data for international comparison, its consistency, and the correction of its consistency to the greatest possible degree

(a) The calculation of quantities which are missing and the calculation of unit values

(b) The major countries and regions focused on are East Asia (ASEAN5, Japan, China, South Korea, Taiwan, India, Australia and New Zealand) and the US

(c) The status of trade data for the CLMV countries (Cambodia, Laos, Myanmar and Vietnam) and its preparation

(2) Formulation and evaluation of trade unit value indices

(a) The stability of unit values and the shift in units of quantity which occur when unit values are employed as values

(b) Continuous study of problems of unit values and the potential for their use when quality changes

(3) International comparison and analysis based on unit value indices, and the achievement of an understanding of trade structure which considers trends in technological change

Based on these related indices, problems related to the formulation of trade indices, chiefly for East Asia and the US, are being focused on in order to study methods of calculation and evaluation of consistent indices and the use of the formulated trade indices in economic analyses (including consideration of methodology).

The study group is reconfiguring trade data into series based on the commodity trade classification systems: the Standard International Trade Classification (SITC) and the Harmonized Commodity Description and Coding System (HS), in addition to series based on several industry classification systems: the 24 industry classifications of the Asian International Input-Output Table compiled in the IDE's project for the formulation of international input-output tables (the IO24 industry classifications), industry classifications formulated by Kinoshita and Yamada, which divide the main industries into 20 categories, and the classifications of the Broad Economic Categories (BEC), which classify industries by materials. Based on these classifications, it is formulating trade matrices at the same time as trade value indices and related indices.

The aim of Part 1 of this volume of the SDS, concerning issues related to the formulation of trade data and the evaluation of its consistency, was to formulate trade data which could act as the base for the formulation of trade matrices and trade indices. The IDE uses UN Comtrade data and trade data for Taiwan from 1971 onwards, which is excluded from UN Comtrade data, converted using an original method to render its form and content consistent with UN Comtrade data, as basic data for the Ajiken Indicators of Developing Economies: eXtended for Trade Statistics (AID-XT), which enable international comparison.

Ebihara and Noda (2007) and Ebihara and Noda (2008) discuss the method used by the IDE to render Taiwan trade data consistent with UN trade data. Using this method, it is possible to employ an HS1988 time series for Taiwan trade data from 1989 to 2006. In addition, the conversion of Taiwan trade data from HS to SITC-R1 enables an SITC-R1 time series to be employed from 1971 to 2006. The conversion from HS

to SITC-R1 uses the method of patterns of identical distribution, which assumes the independence of the classifications of the old and new systems and considers transaction value, discussed in Noda (2007).

The aim of Part 2 is to publish trade indices and to evaluate them. This fiscal year represents the third that the "Formulation and Use of Trade Statistics" study groups have employed trade statistics for the CLMV countries. Two field surveys by the present study group have clarified the status of formulation of trade statistics and the situation of trade data in the CLMV countries. While data remains unsatisfactory for certain of the countries, it is becoming possible to obtain trade statistics and trade data for others. Cambodia and Vietnam have been admitted as reporting countries in UN Comtrade data for the most-recent fiscal year, and this data can be used.

The IDE has formulated trade statistics using SITC-based data drawn from UN Comtrade data for four fiscal years from 2004. In 2005, we published indices formulated using only SITC-R1-based data, and in 2007 we published indices formulated using data based on all the SITC revisions. This year, we have also used HS-based data, and have formulated indices using data based on all the SITC and HS revisions.

In fiscal 2002, indices were formulated for each of the 24 sector classifications of the IDE's Asia International Input-Output Table (IO24) and published as part of the SDS. The base data was AID-XT data prepared in order to formulate a world trade matrix in 2001. Laspeyres, Paasche and Fisher indices were formulated with every fifth year set as the base year. Because the data was formulated for a world trade matrix, the indices at the most-detailed level were indices for each single partner country, and a considerable amount of data was therefore missing from the input data. Base years were set for each reporting country, partner country, direction of trade and IO24 classification in an attempt to make the most effective use of limited data, but the variation in base years made comparison difficult. There were different index series for each SITC revision, and these remained unconnected. In methodological terms, the same method was employed as is being employed at present, in our first attempt to formulate indices using a relational database.

In fiscal 2003, we formulated indices using corrected AID-XT data converted to SITC-R1 and connected as the base data. This enabled all years for the indices to be automatically connected into a single time series. In addition, by aggregating for each SITC-R1 2 digit-level classification, it was possible to formulate separate indices for products included in the same category in 2002 among the machinery categories (e.g. machinery and electrical equipment and machinery) of the IO24. In fiscal 2004, UN Comtrade data which had become available from the Internet was used as the base data. As in fiscal 2003, when indices aggregated for the Kinoshita and Yamada's 20 industry categories were formulated, this data was converted to SITC-R1 and a connected time series was generated, enabling indices to be connected in a single time series. In addition, it was possible to formulate separate indices for the machinery, electrical equipment and machinery, transport equipment and precision instruments categories. With regard to base years, in addition to using the conventional method of setting the base year as every fifth year, indices were also formulated using a chain-linking method in which the base year was changed for every year.

In fiscal 2005, SITC-R2 and R3 were used in addition to SITC-R1, and indices connecting the revisions were formulated. Using data for multiple partner countries, indices were also formulated for individual partner country groups (EU, Japan, Asia, North America, Other) in addition to partner country world. Until fiscal 2004, the direction of indices

differed before and after 1995, but all the 2005 indices were forward indices. The method used in the formulation of the 2005 indices (base year, method of calculation) was basically carried over to following fiscal years, and was the origin of the present method. In fiscal 2006, indices were formulated for an expanded group of 32 reporting countries and regions using the same method as used in fiscal 2005.

In fiscal 2007, aggregated indices were formulated for bilateral trade between 38 reporting countries and regions using the first edition of the UN BEC classifications. In fiscal 2008, indices were formulated for 38 reporting countries and regions using data based on each SITC revision and HS version, and these indices were connected. This enabled indices to be formulated using product classifications closest in nature to those employed in the data submitted to the UN by reporting countries. The indices formulated in fiscal 2007 and fiscal 2008 will be published on the IDE website in 2009.

The aim of Part 3 is intended mainly to capture the relationships between the trade and technological choice. In the chapter 8, the IT industry is explained. The recent technology trend is investigated. Then, it is understood that the tradable technology and the technology which is embodied in labor are competitive and the superiority changes periodically. Also, the technology trend in the near future and its effect to economies and the trade are discussed. In the Supplementary of chapter 8, the case of Hungarian economy is considered. The method of the maximum principle is applied to solve the problem of external debt. In the chapter 9, the explanation for agricultural industry is conducted. The direction of technological choice is assumed to be constant, according to the feature of this industry. It is investigated how differences of development stages and the affiliation to unions such as EU and ASEAN affect to economies and trades.

The aim of Part 4 is to formulate table of unit value indices in general and classification by industrial classification. This indices are caluculated according to the chain-linked Fisher indices using UN Comtrade data.