

## Chapter3 Calculation of Trade Indices based on UN COMTRADE data Connected by SITC-R1

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## Chapter 3

# Calculation of Trade Indices based on UN COMTRADE data

## Connected by SITC-R1

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### Introduction

IDE has calculated trade indices for the past two fiscal years. In FY2002, AID-XT basic data compiled for each of the SITC revisions was used to calculate unit value indices of exports aggregated for the International Input-Output Table 24 sectors. In FY2003, AID-XT basic data connected by SITC-R1 was used to calculate unit value indices of exports aggregated for the top two digits of SITC. IDE's aim in FY2004 was, building on these previous efforts, to calculate highly accurate indices with minimal unnatural fluctuations and with longer-term continuity. Trade indices were therefore calculated for the 20 industry categories established by Kinoshita and Yamada (termed KY20 classifications below; see Kinoshita and Yamada, 1993) using UN COMTRADE time series data connected by SITC-R1, which is now available online. This chapter will discuss the specific procedures utilized in the formulation of these indices.

### 1. Source Data and Calculated Indices

The source data employed in the formulation of trade indices in this chapter was time series data spanning 1962 to 2003 (most recent year) from the UN COMTRADE database.

However, corrected AID-XT basic data has supplied

all data relating to Taiwan and data missing from the online COMTRADE database.

The new trade indices were calculated on the basis of the following conditions:

#### - Reporting countries

The following 31 countries and regions represented in COMTRADE and Taiwan(TWN).

Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), China (CHN), Germany (DDR, DEU), Denmark (DNK), Spain (ESP), Finland (FIN), France (FRA), the UK (GBR), Greece (GRC), Hong Kong (HKG), Indonesia (IDN), Ireland (IRL), Iceland (ISL), Italy (ITA), Japan (JPN), Korea (KOR), Luxembourg (LUX), Malaysia (MYS), Holland (NLD), Norway (NOR), New Zealand (NZL), the Philippines (PHL), Portugal (PRT), Singapore (SGP), Sweden (SWE), Thailand (THA), Turkey (TUR) and the USA (USA).

#### - Direction of trade

Imports, exports and re-exports. (Re-export value is included in export value in the online COMTRADE database).

#### - Partner countries

Only world total.

#### - Type of Indices

Unit value indices, value indices and quantity indices

are calculated using the Laspeyres, Paasche and Fischer formulas. First, indices are determined for each of the KY20 classifications (KY20 indices). These are weighted to formulate aggregated general indices.

#### - Base year formula

Indices were formulated using the following two base year formulas.

(1) Every 5<sup>th</sup> reporting year (1965, 1970, 1975,... 2000) was treated as a base year, and indexes were calculated with the five-year period after the base year treated as the reference year (for example, if 1993 is the reference year, the base year is 1990). These were combined to formulate linked indices with 1995 as 100. This is a fixed base formula.

(2) 1995 was taken as a base point. If the reference year was earlier than 1995, indices were formulated with the next year set as the base year (for example, if the reporting year is 1990, the base year will be 1991); if the reference year was later than 1995, indexes were formulated with the year before set as the base year (for example, if 1999 is the reporting year, 1998 will be the base year). These indices were combined to formulate linked indices with 1995 as 100. This is a chain-linked formula.

## 2. Procedures Employed in Calculating Indices

This section provides an overview of the procedures used in formulating the indices.

### 1. Formulating a conversion table for the KY20 categories

First, a conversion table (SITC05 table) corresponding to the SITC commodity classification master and the KY20 classifications was formulated following the conversion master produced by

Kinoshita and Yamada. Because the SITC commodity classifications which cannot be made to correspond are preserved on an SITC06 table without reference to the KY20 classifications, this data was added to the conversion table after the fact.

### 2. Formulation of COMTRADE original data table

In this procedure the COMTRADE text data was first stored without alteration on a (CTO<CTRY>S1) table. A (CTM<CTRY>S1) table was then formulated using only the most detailed commodity classification data for partner country = world total.

### 3. Supplementation of missing data from AID-XT basic data

In this procedure, data was drawn from AID-XT basic data to make up the data not obtained from COMTRADE. This data was added to a CTM<CTRY>S1 table.

### 4. Achievement of correspondence with KY20 classifications

In this procedure the KY20 classification conversion table formulated in 1. was used to make the COMTRADE SITC commodity classifications correspond to the KY20 classifications.

### 5. Calculation of indices for KY20 classifications

Here, a TI01 table aggregated for the KY20 classifications was formulated from a TR03 table on which the elements (base year, unit value, etc.) necessary for calculating the indices had been set. Finally, a table of indices for the KY20 classifications was formulated. First, unit value indices were calculated. Naturally, unit value indices were not calculated when quantities are unavailable. In addition, when unit values differed from those of the previous year by more than a factor of five or less than a factor of one-fifth, they were inapplicable and were not used in calculating indices. "Basket items" were also excluded from the applicable commodities. Those what called Basket items are multiple

commodities which cannot be classified using existing commodity classification. Here, goods with SITC commodity classifications ending with 9 and beginning with 9 are considered as basket items (i.e., Goods which are classed in the major SITC section as 9, "Goods not classified by kind"). What amount of value and how many pieces of data are employed in calculating unit value indices are important issues; these parameters were calculated as a representative ratio of value and a representative ratio of data on a TC03 table, and represented on the KY20 index table. By contrast, value indices were calculated on a TI02 table on the basis of the entire data set. Quantity indices were calculated on the TI03 table by dividing the value indices by Fischer unit value indices.

#### 6. Formulation of weight tables for general indices

In this procedure the weight in each KY20 classification is determined for the same key items - reporting country, partner country ("world total" in this case), direction of trade and reporting year (base year or reference year) - to enable general indices to be calculated from the KY20 indices. For Laspeyres general indices a TW55 weight table was formulated for each base year, and for Paasche general indices a TW58 weight table was formulated for each reference year.

#### 7. Calculation of general indices

Here, weight table made in 6. and the TI01 table previously used to calculate value indices when the KY20 index table was formulated were used to calculate general unit value indices on a TI23 table. As in the case of the KY20 index table, the general value indices were calculated on a TI22 table on the basis of the entire data set, and the general quantity indices were formulated on a TI23 table by dividing the general value indices by Fischer general unit value indices. General indices were output from this TI23 table and the TC23 table on which the

representative ratios were determined.

#### 8. Calculation of terms of trade indices

In this procedure, the export indices calculated at stages 5 and 7 were divided by import indices to generate terms of trade indices. KY20 indices and general indices were also calculated for the terms of trade indices.

#### 9. Index data aggregation and formulation of index matrix tables

Here, a TI33 table aggregating the KY20 indices and the general indices was formulated, after which index tables (index matrix tables) were formulated for reporting country and base year formula. The tables formulated at this stage can be found at the end of this volume.

## Conclusion

The calculation of indices in this chapter differs from our previous attempts in that COMTRADE data available online was used as the source data, and chain-linked formula was employed. Determining how these changes in source data and base year formula are reflected in the indices is an issue for future investigation, as is improvement of the method of calculating the indices.

A problem which can be pointed out immediately is the significant fluctuations in the chain linked import general indices for the US. It will be necessary to determine why these fluctuations occur.

## Reference

Kinoshita, Soshichi and Yamada Mitsuo (1993) ,"Estimates on Sectoral Export Price Indices by Country for Global Economic Modeling", *Economic Research*, No. 97, Nagoya University, Japan