



UNITED NATIONS
DEPARTMENT OF ECONOMIC
AND SOCIAL AFFAIRS
STATISTICS DIVISION



ANDEAN COMMUNITY
GENERAL SECRETARIAT



UNITED NATIONS
ECONOMIC COMMISSION FOR
LATIN AMERICA AND THE
CARIBBEAN

**Regional Workshop on Country Practices in Compilation of
International Merchandise Trade Statistics, 7-11 May 2007, Lima**

Agenda item No. 16: Calculation of Export and Import Price Indices (XMPI)

Background document

Language: English

RECENT DEVELOPMENTS IN THE PRODUCTION OF INTERNATIONAL TRADE INDEX NUMBERS

Feature article in the International Trade Statistics Newsletter
(March 2006), prepared by

United Nations Statistics Division (UNSD)



SPECIAL FEATURE:

RECENT DEVELOPMENTS IN THE PRODUCTION OF INTERNATIONAL TRADE INDEX NUMBERS

Meaningful price and quantity indexes are essential for the analysis of international trade transactions. This presupposes: (1) having a clear and accurate definition of the concept the indices intend to measure, and (2) establishing a clear link between measurement goals and measurement instruments.

On the conceptual level, the United Nations Statistics Division (UNSD) has played an important role in the development of principles followed by national statisticians in the construction of foreign trade indices. This has led to a consensus among trade statisticians on the purpose of price index numbers of imports and exports, which “should measure in the aggregate the price changes of goods actually moving in world trade”, capturing not only their narrowly defined supply and demand determinants, but also “the effects of such diverse factors as international trade agreements; national monetary policies as to convertibility of currencies; governmental control of trade [...]; the availability and cost of transportation, etc.”¹

Nevertheless, bringing together the precise definitions of import and export transactions used by trade statisticians and national accounts statisticians is still challenging. Whereas in the System of National Accounts (SNA) foreign trade transactions are defined by change of ownership of goods between residents and non-residents, the concepts and definitions of International Merchandise Trade Statistics (IMTS) rely on the principle of goods crossing the border to record imports and exports.

There are other unsolved controversies at the operational level as well. Possibly the most persistent issue concerns the advantages and disadvantages of unit value indices (based on aggregate customs data), as opposed to price indices (constructed using product-specific data from surveys), which was already the object of extensive analysis

in the 1981 United Nations Manual *Strategies for Price and Quantity Measurement in External Trade*².

A study of country practices conducted by the UN and published in 2005, shows that from a total of 77 surveyed countries that produce unit value and/or price indices of international trade transactions, 75 per cent compile unit value indices only, while 17 per cent exclusively calculate price indices.³ One of the reasons why most national statistical offices focus on unit value calculations for specific groups of commodities (e.g., manufactured products), is that they have limited resources to implement price surveys.

Even without resource considerations, it is extremely important to maintain a balanced view of the advantages and disadvantages of both unit value and price survey approaches, and to identify the instances in which each of them is more appropriate. Also, it is essential to continuously fine-tune the production process of external trade indices to ensure that they accurately reflect the development of prices in the real world.

Some of the earlier critiques of unit-value indices resulted from the fact that, in the past, customs data frequently did not record or incorrectly recorded transaction quantities. More recently, however, the widespread adoption of information technology tools such as ASYCUDA (Automatic System for Customs Data), has tremendously improved controls in customs administration and compliance, rendering customs records a more accurate measurement instrument, readily available for statistical data collection. Similarly, recent advances in information and communication technologies—coupled with the modernization of the institutional and legal framework for data collection in many countries—have allowed for major improvements in price data collection via business

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For details on
the develop-
ment of the
XMPI manual,
visit
www.imf.org



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surveys. Thus, many statistical offices are now able to come up with innovative solutions for creating cost-effective sample designs, reducing non-response rates, or controlling the bias due to the tendency that sampled businesses sometimes have to report prices with too little variation from period to period.

Still, there are many implementation issues that concern *both* (customs-based) unit value and (survey-based) price indices of imports and exports. Among these issues, are: (1) the difficulty in defining the set of product variants that go under each commodity description, (2) the need to detect and prevent errors and biases in all stages of the production process of trade indices, (3) the need to supplement trade indices with comprehensive metadata (including their scope of application and their methodological strengths and weaknesses).

Composition of basic aggregates

Even the most detailed commodity or product descriptions used in data collection have to aggregate transactions that refer to different variants of similar products, leading to heterogeneity in the composition of basic index numbers. Ideally, the shares of individual product variants under the same commodity description should remain constant, so heterogeneity would not be a problem in itself. However, if the mixture of product variants within an elementary commodity aggregate changes, the corresponding price or unit value index would change even if the prices of the different product variants remained constant.

The bias caused by changes in the composition of basic aggregates becomes a serious concern both when the classification of commodities becomes too coarse (i.e., when the same commodity description refers to substantially different products), and when a product category belongs to an industry that is experiencing rapid technological or demand changes (either rendering the initial sample of products less representative or introducing quality-change effects in the final unit value or price series). Thus, statisticians constantly need to monitor whether the current basic commodity aggregates allow them to generate meaningful index numbers, or whether the level of heterogeneity and variability in the composition of basic aggregates

is a significant source of bias.

A starting point in assessing heterogeneity as a potential source of bias is to look for cues in the statistical distribution of the available data. For example, high levels of variability, and especially the presence of multimodality, often indicate that the measures of price and quantity obtained at the current level of aggregation are not reliable. There has already been a lot of progress in this kind of data diagnosis, and many agencies are currently devoting resources to projects to determine which commodities have "well behaved" data, so as to yield meaningful unit values of imports and exports. As an example, the UN Statistics Division is currently developing a simple automatic procedure to detect multimodality in the distribution of unit values obtained from the Comtrade database at the 6-digits level of aggregation in the Harmonized System (HS) of commodities classification. However, there is still much to be done in this regard, and we shall expect significant methodological innovations in the years ahead.

Data quality assurance

Following the idea that "exceptional" values are more likely to be incorrect, there is also a good case for systematically applying outlier detection techniques along the process of creating price or unit value indices of imports and exports. Of course, every rule for outlier detection requires more or less stringent assumptions about what is meant to be a "usual" price or unit value, and therefore involves some degree of subjectivity. Also, manual detection of outliers would be extremely time-consuming, especially in view of the enormous amount of data that international trade statisticians deal with. Thus, quantitative statistical rules for automatic outlier detection are always preferable to case-by-case decisions that depend more heavily on personal judgments. Good outlier-identification techniques should be robust, meaning that the thresholds between usual and an unusual prices or unit values do not change too much when the number or magnitude of outliers increases.

A well tested method for detecting outliers automatically is the so-called *boxplot*. As this tool can only be applied to uni-modal distributions, and there is evidence indicating that the method breaks down if the number of

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outliers is too large, outlier detection cannot be considered in isolation but has to be part of a comprehensive data-quality management system that combines multimodality and variability checks.

Current agenda

There are still many open research topics in the field of exports and imports price indices, and many long-standing controversies are still far from being solved. However, progress is being made. A Technical Expert Group within the Inter-Secretariat Working Group on Price Statistics was set up to develop a Manual on Export and Import Price Indices (XMPI), with the International Monetary Fund (IMF) as the lead agency. The work of this group can be accessed at <http://www.imf.org/external/np/sta/tegeipi/>, and has given occasion for very fruitful discussions on theoretical and practical issues in

the production of index numbers of international trade. This includes intensive discussions with members of the Task Force on International Merchandise Trade Statistics (TFIMTS). It must be noted that while the preliminary versions of the XMPI focused more on the survey approach to foreign trade indices, it is expected that updated versions will lean towards an approach that combines *both* price surveys and unit value calculations.

¹ Quoted from United Nations (1958): *Methods Used in Compiling the United Nations Price Indexes for Basic Commodities in International Trade*, p. 2. Publication Sales No.: 58.XVII.9.

² United Nations (1981): *Strategies for Price and Quantity Measurement in External Trade*, Publication Sales No.: E.82.XVII.3. See also United Nations (1983): *Price and Quantity Measurement in External Trade: Two studies of national practice*, Publication Sales No.: E.82.XVII.3.

³ United Nations (2005): *National Practices in Compilation and Dissemination of External Trade Index Numbers*, Publication Sales No.: E.04.XVII.10.

DATABASE AND PUBLICATIONS: NEW PUBLICATIONS BY UNSD AND OTHER ORGANIZATIONS

UNCTAD Handbook of Statistics 2005

Released in December, 2005, the Handbook offers a comprehensive collection of statistical data relevant to the analysis of international trade, investment and development, for individual countries and for economic and trade groupings.

The publication presents consolidated reference statistics for describing how developing countries have evolved in the context of globalization. Data are presented in an analytical way, through the use of rank orderings, growth rates and other special calculations, in order to facilitate their interpretation. The printed edition of the Handbook is a valuable tool for research, policy making and education, which can also be used in conjunction with the CD-ROM or the On-line of the publication. The latter two contain the full time series of data



OECD Handbook on Economic Globalisation Indicators

This publication responds to the increasing demand for measures to analyze the trends of globalisation, providing a conceptual and methodological framework for gathering quantitative information and constructing indicators. It is the outcome of co-operation among experts from the OECD Secretariat, member countries and international organisations.

The Handbook proposes a set of indicators, essentially in the form of ratios derived from basic statistics measuring the magnitude and intensity of the process of globalisation in its different dimensions.

It focuses on issues that are considered the mainsprings of globalisation: international trade, foreign direct investment, the activity of multinational firms and the production and international diffusion of technology.



COOPERATION WITH COUNTRIES AND AGENCIES: 37TH SESSION OF THE STATISTICAL COMMISSION IN NEW YORK, 7-10 MARCH 2006

Since a few years now, the agenda of the United Nations Statistical Commission (UNSC) meeting is divided into items for discussion and those for information. Under this year's information item "International Merchandise Trade Statistics" (IMTS), the UNSC took note of a progress report of the Task Force of IMTS, and a joint UN/OECD report on the collaborative activities of the two organizations in this field. Both reports have been placed on OECD's website as background information to this meeting.

The first report gives a summary of the achievements and activities of the Task Force over the period from 2003-2006, which covers the release of the IMTS Compilers Manual and of the National Practices of Compilation and Dissemination of External Trade Index Numbers, and describes the ongoing activities in the areas of methodology, classification and database development. In particular, it describes the work on the Common Data Set.

The second report describes in detail the collaborative effort of the United Nations Statistics Division and the Statistics Direc-

torate of OECD to share data collection and to develop a joint data processing system. Specific achievements include: (a) an agreement on data collection and data sharing arrangements; (b) common data processing standards; and (c) computer applications for data processing and dissemination. Standards refer to country codes, trade conversion factors, commodity classifications and correlation tables, quantity units and quantity estimations, confidentiality, and metadata.

The major achievement of the 37th UNSC was a resolution on Strengthening Statistical Capacity. It expresses concern about the validity of the use by international organizations of imputed data, and urges donor countries and organizations to support developing countries in strengthening statistical capacity. Other important decisions in relation to IMTS were the adoption of ISIC, Revision 4, and CPC, version 2.0, the recommendation that the concept of an integrated approach to national economic statistics programmes be operationalized, and the establishment of the Oslo Group on Energy Statistics.

For references on methodology, visit unstats.un.org/unsd/trade/



YOU HAVE ASKED US:

CHANGES IN TRADE REPORTING PRACTICES OF COUNTRIES WITH COLONIES

Q: Are changes in political boundaries taken into account in UN trade statistics? For example, are colonies such as Algeria for France or Kenya for the UK part of the territories of France and UK until their independence? Is trade between a country and its colonies reported as international trade or not reported because it is considered as domestic trade?

A: The international recommendation on the coverage is that international merchandise trade statistics (IMTS) record all goods which add to or subtract from the stock of material resources of a country by entering (imports) or leaving (exports) its economic territory. The economic territory is not the same as the political territory, or even the geographical territory, of a country.

For the IMTS of France, the economic territory includes Monaco, but does not include the overseas territories. Beginning 1996, France includes overseas departments (French Guyana, Guadeloupe, Martinique and Réunion) in its economic territory. In general, colonies have not been part of the economic territories of France or the United Kingdom. For instance, trade was reported between France and its colonies in the 1950 Yearbook, which shows trade of Algeria, Belgian Congo, and Ruanda. For references on methodology, please go to:

<http://unstats.un.org/unsd/trade/methodology%20IMTS.htm>



For merchandise trade data by commodity and partner country please visit UN Comtrade at <http://comtrade.un.org/>

YOU HAVE ASKED US: STATISTICAL VS. ECONOMIC TERRITORY

Q: What is the difference between the statistical and the economic territory of a country?

A: The statistical territory of a country or area is "the territory with respect to which data are being collected", that is, goods which enter or leave the statistical territory are to be recorded in the external trade statistics.

The economic territory of a country consists "of the geographic territory administered by a government within which persons, goods and capital circulate freely" and includes:

- (a) Airspace, territorial waters, and continental shelf lying in international waters over which the country enjoys exclusive rights or over which it has, or claims to have, jurisdiction in respect of the right to fish or to exploit fuels or minerals below the seabed;
- (b) Territorial enclaves in the rest of the world (clearly demarcated areas of land which are located in other countries and which are used by the government which owns or rents them for diplomatic, military, scientific or other purposes - embassies, consulates, military bases, scientific stations, information or immigration offices, aid agencies, etc. - with the formal political agreement of the government of the country in which they are physically located);
- (c) Any free zones, or bonded warehouses or factories operated by offshore enterprises under customs control (these form part of the economic territory of the country in which they are physically located).

The economic territory of maritime countries "includes any islands belonging to that country which are subject to exactly the same fiscal and monetary authorities as the mainland, so that goods and persons may move freely to and from such islands without any kind of customs or immigration formalities." ³ The economic territory of a country does not include the territorial enclaves used by foreign governments or international organizations which are physically located within the geographical boundaries of that country.

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UPCOMING EVENTS: WORKSHOP ON IMTS COMPILATION IN DOUALA, JUNE 12 TO 15

The UN Statistics Division (UNSD) in cooperation with the Economic and Monetary Community of Central Africa (CEMAC) is organizing a workshop on the compilation of international merchandise trade statistics, which will take place from 12 to 15 June 2006 in Douala, Cameroon.

This workshop is part of a special effort to improve availability of international merchandise trade statistics from African countries in view of growing demand

for such statistics from various users worldwide.

Its main purpose will be to identify difficulties and find solutions for a more effective compilation of merchandise trade statistics as an output of automated customs systems. Special attention will be devoted to cases where the Automated System for Customs Data (ASYCUDA) is implemented or will be implemented in the customs administrations.

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For the agenda and documents of the Task Force on SITS please click <http://unstats.un.org/unsd/tradeserv/meetings-tf.htm>



UPCOMING EVENTS:
**WORLD CUSTOMS ORGANIZATION MEETING
 IN BRUSSELS, FROM JUNE 20 TO JULY 1**

The World Customs Organization (WCO) is organizing the 107th / 108th Sessions of the Customs Co-operation Council in its headquarters in Brussels, from June 29 to July 1, 2006.

During the sessions, attended by Director Generals of national customs administrations, a high-level debate on strategic trade issues will take place. Also, the work done by the five WCO Committees during the past year will be examined in parallel to the Council's plenary session. Panel discussions led by speakers from the private sector will focus on the international trade supply chain and the effect of new technologies

on training.

The WCO Council will adopt recommendations on issues including rules of origin, valuation, the Harmonized System, trade facilitation, and enforcement of customs regulations.

The United Nations Statistics Division has been invited to attend the Sessions. Its participation will underline the importance of taking into account needs of the statistical community with the ultimate goal of preserving high quality of trade data, as is the case of the UN Comtrade database.

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UPCOMING EVENTS:
**5TH ANDEAN EXPERT MEETING ON SITS
 IN LIMA, JULY 10- 12**

The Andean Community (CAN) will host from July 10 to 12 in Lima the 5th Andean Governmental Expert Meeting on Statistics of International Trade in Services (SITS).

The meeting is part of the EU-Andean Community on Trade Related Technical Assistance Cooperation Project (TRTA I Project), aimed at deepening Andean trade integration and its international relations with third parties.

The Expert meeting will provide a forum for Andean countries to discuss methodological proposals on statistics in services, including rail, road and inland waterway transports; information

services; business services; audiovisual and related services; postal and courier services; and insurance, financial and government services.

Various international organizations have been invited to participate, including the UN Statistics Division (UNSD), the International Monetary Fund (IMF) and the Spanish National Institute of Statistics.

Other issues in the agenda will include changes to the Balance of Payment Manual, the inter-agency Task Force of SITS, as well as the consultation questionnaire on revision of the SITS manual.

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EDITORIAL NOTE

The Trade Statistics Newsletter is a quarterly publication prepared by the International Trade Statistics Section of the United Nations Statistics Division – Department of Economic and Social Affairs. This Newsletter is not an official document of the United Nations nor does it express the official position of the United Nations. Editorial team: Vladimir Markhonko, Ronald Jansen, Markie Muryawan, Matthias Reister, and Luis González (Executive Editor).

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