

**UNSD-SACU workshop
on the implementation of the new recommendations
for International Merchandise Trade Statistics (IMTS 2010)
in SACU Member States**

12 – 15 June 2012, Johannesburg, South Africa

External Trade Indices



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General Overview

- **Need for external trade indices.** For those users who require information on changes in the prices or volumes of traded commodities over time, data consisting of trade values by country or commodity are not sufficient.
 - As the prices of different commodities do not all change at the same rate, an external trade index number summarizes their overall price movement by taking their weighted average.
 - The external trade index numbers in an index series are all proportional to a reference period, so the value of the index in other periods provides the average proportional change from the reference period.
- **Uses of external trade indices.** External trade indices are generally used to eliminate the effects of price changes and to obtain estimates of the changes in trade volume, and for calculating “constant” prices.
 - **National accounts** require a decomposition of measures of value into measures of price and quantity to determine real flows.
 - Government departments and international agencies use price indices to define, evaluate and resolve **trade policy** issues. They provide a key tool for tariff and quota negotiations, providing an indication of import and export inflation, as well as the international competitiveness of various industries and sectors.
 - Business analysts and economists use these indices to research the causes and effects of import and export price changes on overall trade and the economy.

General Overview (continued)

- **Levels of aggregation.** External trade indices can be disseminated at varying levels of commodity aggregation. The commodity detail required for external trade indices varies by the needs of end users:
 - For some uses, the usefulness of price and volume changes depends on its breakdown by commodity, as in the case of decisions related to tariff policy and measures of productivity by industry.
 - For other uses, no detailed information by commodity type is necessary, as is the case when calculating a country's terms of trade.
- **Economic uses.** External trade indices are essential for many key essential uses:
 - National accounts require price and volume indices to estimate macroeconomic aggregate in constant prices.
 - For export and import data to be useful in macroeconomic forecasting and model-building, they often must use constant prices, which requires external trade indices.
 - Studies that serve tariff policy discussions require the availability of highly disaggregated external trade indices.
 - Competition policy studies looking at price-based competition versus quality-based competition also use detailed import and export trade indices.

Data Sources and Measurement

- **Price indices vs. unit value indices.** Typically external trade indices are calculated from two sources—from unit values obtained through customs, from price information obtained through establishment surveys, or from a combination of the two sources.
- **Other sources.** Additional sources of data can be obtained through commodity boards or associations of exporters and importers, or by using price indices of partners as proxies or supplementary indicators.

Customs records vs. price surveys

- **Advantages of customs records:**
 - Increase number of observations, reducing sample variance.
 - Often provide nearly full coverage of the transactions on which the target population should be based.
 - Not very costly to produce.
- **Advantages of price surveys:**
 - Lower risk of erroneous data and misclassification
 - Better possibilities to control for bias due to relevant non-price factors, including changes in the mix of products and changes in product quality.

Challenges

- **Heterogeneous product categories in detailed customs records**
 - Product codes, even at the most detailed level, often group together “different” types of goods from the perspective of unit value calculation.
 - This can lead to “unit value bias,” whereby changes in the compositional product mix at the most detailed product code-level can lead to changes in the unit value indices.
 - Because the unit value index is calculated as a weighted index, changes in the compositional product mix should not lead to changes in the index level.
 - For example, if a single product code groups a particular type of computer where all characteristics are the same except the number of CPUs, then if there is a trend over time towards machines with four CPUs (which is more expensive) and away from machines with two CPUs (which are less expensive), will raise the UVI index even if the price of either product stays the same—simply because the compositional product mix has changed.
- **Errors in filing customs declarations**
 - Large differences in the highest and lowest values for a particular product code are often due to errors when filing customs declarations.
 - These can substantially reduce the information value of unit value indices by introducing large amounts of statistical noise.

Challenges (continued)

- **Simplification of customs declaration requirements**
 - Unit value indices require complete customs records with sufficient details on the individual transactions.
 - Reductions in the level of detail collected by customs declarations can also reduce the quality of the unit value indices.
- **Price surveys: incomplete coverage, small sample size, and cost**
 - When price-based surveys are used instead of unit-value based customs records, small sample sizes may not be sufficiently representative of all transactions taking place.
 - While the potential for sufficiently identifying homogenous products is theoretically greater, price based surveys are far more costly and time consuming.
- **Price surveys: trade-off between availability and comparability**
 - The higher the level of product-differentiating detail collected in price survey responses, the more difficult it is to group like commodities with other like commodities.

Calculating external trade indices

- **Elementary unit value indices calculated for a single commodity**
 - For any one collection of homogenous products, it is possible to calculate an elementary unit value index on a single product by taking the ratio of total value (V_t) and total quantity (Q_t) of the collection in the year of interest, and dividing it by the ratio of total value (V_0) and total quantity (Q_0) of the collection in some reference year—say, at year 0:

$$\frac{V_t / Q_t}{V_0 / Q_0}$$

- The technical challenge in the calculation of elementary indices is determining homogenous product groups, which involves the detection and removal of outliers.

Calculating external trade indices

- **Unit value indices at higher levels of aggregation**

$$\frac{V_t / Q_t}{V_0 / Q_0}$$

- The technical challenge in the calculation of elementary indices for a single commodity is determining homogenous product groups, which involves the detection and removal of outliers.

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**Developing a Common IT Language Within
SADC: The SAS Users Group of SADC
Countries**



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Background

- The UN Statistics Division executed a UN Development Account project from 2006 to 2010 to strengthen the capacity of the statistical systems of the SADC member states.
- In November 2009, the Chief Statisticians of the SADC countries decided that a common software tool would be beneficial for the NSOs of the community, which would make it possible to share applications among the offices. They chose the SAS software at the suggestion of Statistics South Africa.
- As a direct follow-up to this decision, a training session on use of SAS software was organized in August 2010 at Statistics South Africa.

Background (continued)

- Early 2010 a process was started to acquire software licenses for the NSOs of the SADC countries. Only recently the UN administration reached an agreement with SAS Institute to acquire 10 licenses of Base SAS and SAS Analytics Pro for each participating SADC country.
- Base SAS and SAS Analytics should now be installed and ready to use on various PCs or Laptops in the participating NSOs.
- In order to facilitate the actual use of the software, UNSD has formed a SAS Users Group of SADC member states and an online discussion forum dedicated to the initiative.

SAS Users Group for SADC Member States

- UNSD has formed a SAS Users Group of SADC Member States as a means of working with SADC countries which newly acquired SAS and to facilitate learning and using SAS within the context of work relevant to national statistical offices.
- The current participating SADC member states are:

Mauritius	Mozambique
Botswana	Madagascar
Lesotho	Congo
Malawi	Namibia
Swaziland	

Objectives of the Users Group

The ultimate goal of this initiative is that SAS would be a useful tool for the NSOs, thereby improving productivity and facilitating collaboration among the institutes.

To achieve this objective, we have identified three phases:

1. In the first phase the SAS Users Group will construct step-by-step a SAS application for the calculation of external trade indices based on unit values. The group will start by manipulating, checking and validating transaction-level merchandise trade data which will help to familiarize the participants with the use of SAS.
2. In the second phase, it will be attempted to share existing SAS applications of Statistics South Africa with other SADC NSOs.
3. The final task will be to contact other SAS users of more developed statistical offices, including those in the UK, Australia, US BEA or Norway, and investigate whether they would be able to share useful statistical programs written in SAS.

The role of the just established SAS Users Group is mostly restricted to the first phase.

Why External Trade Indices?

- External trade price/unit value indices measure the proportional rate of change in the prices (or unit values, explained below) of imported and exported commodities.

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Why Unit Value Indices?

- Unit value indices contain
- Information value: Calculating unit value indices from a transaction-level trade statistics data set contains useful information that is already present in the trade data—it is a way of extending the usefulness of customs' data.
- Implementation of the recommendations is necessary for the calculation of trade unit value indices—in particular as concerns the inclusions and exclusions of particular transactions, the use of WCO standard units of quantity,
 - the same inclusions and exclusions described in IMTS 2010, and need to be calculated on a transaction-level data set that has been compiled, to the extent possible,
- Quality check:
 - The quality of external trade indices calculated from unit values is contingent upon many of the steps that go into properly compiling trade statistics.
- Trade unit value indices make use of Likewise, much of the data preparation work necessary in producing high quality unit value indices is also necessary in producing high quality trade statistics.

Thank you for your attention