

Changes in the International Merchandise Trade Price Index

The April 2001 release introduces changes in the time base, also referred to as the base period, of the International Merchandise Trade Price Index (IMTPI) series, an up to date price structure as well as improvements in the concepts and procedures. These changes will result in a more accurate representation of trade data.

Rebasing of Index Series and updating the basket

As a matter of policy, the time base of the International Merchandise Trade Price Index series is periodically changed, to coincide with that of other major series produced by Statistics Canada. In the release of April 2001, the base period of the IMTPI series has been changed to "1997", replacing the 1992 base period. The IMTPI is available for the 1997 base period starting January 1997. March 2001 is the last month where the IMTPI has been calculated with the 1992 base period.

The rebasing of an index series (i.e. its conversion from one time base to another) is an arithmetic operation that affects neither the nature of the series nor alters the rate of price change measured by the series between any two periods. However, the current update involves more than a simple rebasing. In order to reflect the changes in the structure of international trade, the 1992 basket of goods has been updated. These changes have caused a modification in the nature of many series and the rate of price change. With the current IMTPI update, the 1997 basket of exported and imported commodities replaces the 1992 basket in the calculation of the Laspeyres and Paasche Indexes.

Selection of the Commodities and their Estimation Method

The IMTPI is a composite price index designed to express, in a single index, price changes that involve a range of commodities. In order to accurately reflect the realities of the price movement a fixed basket of goods is chosen which are representative and correlated to the rest of the commodities in the trade universe. All commodities in the 1997 basket have been divided into Groups where criteria, such as value were used to select the most significant ones.

Once the basket is fixed, the appropriate method for measuring the price of each commodity must be determined. The calculation of aggregated trade indexes blends unit value indices with specified indexes. The indexes are based on a non-random sample of import and domestic export commodity classes for which either a meaningful unit value can be calculated or for which a representative proxy index can be found. The decision to use a unit value as a price relative is derived from the information available in the trade data. Trade data is derived from the administrative records of the Canada Customs and Revenue Agency. Detailed notes on Customs concepts and collection methods are available in the "Summary of Canadian International Trade" (Catalogue no. 65-001). U.S. exports data are primarily derived from administrative records of The United States Bureau of the Census. As a general rule, unit values are retained for relatively homogeneous commodities such as primary and semi-manufactured goods (approximately 15% of the commodities) and proxies are used for heterogeneous commodities, particularly manufactured goods ready for final use.

Where a unit value is not sufficiently indicative, such as those commodities in the End Products section, a substitute or "proxy" index from an outside source is substituted. Once it is determined that a proxy is needed, a suitable foreign proxy is identified and assigned. Several organisations provide the International Trade Division with proxies that are used as price relatives in the calculation of the Laspeyres and Paasche price indexes. They are:

- The United State Bureau of Labor Statistics (USBLS) Producer Price Indexes (PPI) - The PPI is provided by the USBLS and includes approximately 2000 indexes at various levels of aggregation. The index is converted to Canadian dollars using the USA monthly, unadjusted noon spot rate and re-scaled so that all indexes have a common base year of 1997=100. Most of the specified price indexes taken

from the PPI are used to calculate the import price indexes. This is a reasonable choice since the United States accounts for most of the imports of the commodities concerned.

- Statistics Canada publishes the Industrial Product Price Indexes (IPPI) that include approximately 1000 indexes by various commodity groupings. Most of the specified price indexes taken from the IPPI are used to calculate the export price indexes. The IPPI for certain groups are assumed to exhibit the same characteristics of an export price index where one does not exist. No transformation of the data is needed as they are already in Canadian funds.
- Bank of Japan Export Price Index - The Bank of Japan provides the Japanese Wholesale Price Indexes. About 75 indexes are used. The index is converted to Canadian dollars using the Japan monthly, unadjusted noon spot rate. These indices are generally used for Japan imports and any country of origin that is of greater similarity to Japan than the United States.
- The National Energy Board for price data on electricity and the Manufacturing Construction and Energy Division of Statistics Canada provides data on exports of crude petroleum and natural gas (by pipeline).
- Bureau of Economic Analysis Computer Price Index by Component - Seven indexes are supplied by the Prices Division of STC that originate from The BEA.
- Automotive Price Index by Model - Monthly data from PRICES Division containing car and truck price indexes for individual car models. A concordance file was developed and is maintained by the International Trade Division.

Concepts and Procedures revised

Like other updates, the current one provided an opportunity to review the IMTPI concepts and procedures. Their purpose is to make the IMTPI a more thorough and rational indicator of merchandise price movement at the « all country » and United States level, given the available resources. The major improvement is that price indexes will be chained in order to deal with the changes in the definition of merchandise codes¹ through time.

Changes in HS codes can occur in many different ways. When an HS code changes, it's elementary segment² including its Trading Area, Unit of Measure, method of computation, and aggregation to a specific Summary Group is also susceptible to change. The most common HS code changes involve:

- **Re-code** (one HS number is changed but the content has not changed) - Roughly 65% of HS changes involve a change to the code but not the content. These new codes are simply "added" to form a continuously priced line.
- **Merge** (more than one HS codes are combined into one new HS code) - This situation is relatively common and reduces the overall number of codes. If the attributes of all old codes are the same, the source for the new HS code is made the same as the old ones. When an HS code merge is not straightforward, where multiple choices exist among the old codes, then the price analyst must choose based on the attributes of the merged codes.
- **Split** (one HS is split into at least two new HS) - Usually a result of requests for more detailed information on commodities. The new HS codes generally take the same attributes as the source code.

Some improvements were made to deal with changes in the HS code attributes, such as a change in the estimation method or a change in the unit of measure. Several less obvious changes have been implemented. For example: the weights are now fixed at the elementary index level instead of the Summary Group level, the true current weighted (K\$ weighted Paasche) and fixed weighted (Laspeyres) price are

¹ On January 1 1988 Canada adopted the Harmonized Commodity Description and Coding System (HS).

² The elementary index level is the most descriptive level for which unit values can be calculated.

now used, an improved unit value calculation procedure³ where both geometric and arithmetic means are used at the first-stage of aggregation of collected price data. The aim of these changes and other less visible changes is to enhance the efficiency of processing price data in the context of limited resources, and to reduce the risk of biases in price indexes at all levels of aggregation starting at the elementary index level.

Brief introduction of the index

The International Merchandise Trade Price Index (IMTPI) is an indicator of the changes in import and export prices. The IMTPI measures price change by comparing, through time, the weighted average cost of a basket of traded commodities. The price indexes are based in part on actual unit values processed by the International Trade Division and, when the unit values are not accurate or are unavailable, by the use of price relatives provided by other sources. To better aid analysing of data these price indices are calculated on both a Paasche (current weighted) and a Laspeyres (fixed/base weighted) basis. Weights are based on the volume of traded goods in the base period and are contrasted with data from the current month. This allows the price index to reflect pure price movements in the Laspeyres model and price/quantity movements as provided by the Paasche index. On top of these benefits the indices are also calculated at various levels of aggregation including an all country level and on "United States" level. This procedure allows trade with the United States to be analysed isolated from the rest of the trade data, reflecting the relative importance of the United States as Canada's major trading partner. In the end, the main use of the import and export price index is to deflate, to constant dollars, Canadian merchandise trade, which are input into the Canadian system of National Accounts calculation of GDP.

³ The Hidioglou-Berthelot Historical Trend Method is adapted and used to identify transactions within an aggregation that are "abnormal" for a given period.