



Catalogue no. 65-507-MIE — No. 003

ISSN: 1712-1345

ISBN: 0-662-39968-4

## Analytical Paper

### Canadian Trade Review

# Merchandise Trade Reconciliation Study: Canada-China, 2002 and 2003

by Sandra Bohatyretz and Bruna Santarossa

International Trade Division  
9th Floor, Jean Talon Building, Ottawa, K1A 0T6

Telephone: 1 613 951-9647



Statistics  
Canada

Statistique  
Canada

Canada



## Merchandise Trade Reconciliation Study: Canada-China, 2002 and 2003

---

Sandra Bohatyretz and Bruna Santarossa

August 2005

Catalogue no. 65-507-MIE  
ISSN: 1712-1345  
ISBN: 0-662-39968-4

Frequency: Occasional

La version française de cette publication est disponible sur demande  
(n° 65-507-MIF au Catalogue)

### How to obtain more information

National inquiries line: 1 800 263-1136

Specific inquiries about this product and related statistics or services should be directed to: Marketing and Client Services Section, International Trade Division, Statistics Canada, Ottawa, Ontario K1A 0T6 telephone: (613) 951-9647, Facsimile Number (613) 951-0117 or 1 800 664-0055.

Published by authority of the Minister  
responsible for Statistics Canada

© Minister of Industry, 2005

All rights reserved. The content of this publication may be reproduced, in whole or in part, and by any means, without further permission from Statistics Canada, subject to the following conditions: that it is done solely for the purposes of private study, research, criticism, review, newspaper summary, and/or for non-commercial purposes; and that Statistics Canada be fully acknowledged as follows: Source (or "Adapted from," if appropriate): Statistics Canada, name of product, catalogue, volume and issue numbers, reference period and page(s). Otherwise, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopy, for any purposes, without the prior written permission of Licensing Services, Marketing Division, Statistics Canada, Ottawa, Ontario, Canada K1A 0T6.

### Note of appreciation:

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

## Overview

China became Canada's second largest trading partner in 2003, surpassing Japan. According to Canadian-published statistics, two-way trade between Canada and the People's Republic of China increased almost five-fold in the last decade, from \$4.8<sup>1</sup> billion in 1993 to \$23.3 billion in 2003.

Canada's recorded merchandise trade deficit with China has increased almost eight-fold since 1993, reaching \$13.8 billion in 2003.

Trade statistics produced by one country will frequently differ from those produced by its trading partner(s). In theory, for example, Canada's recorded exports to China should equal China's reported imports with Canada and vice versa. However, this is not the case.

The discrepancies between Canadian and Chinese published statistics are significant. For example, in 2002, reported Chinese import trade exceeded Canada's reported exports by \$1.6 billion. The following year, the gap was \$1.4 billion. Similarly, in 2002, Canadian-reported imports exceeded China's reported exports by \$9.2 billion. In 2003, the gap was \$10.7 billion.

**Table 1a: Canadian exports compared with Chinese imports, 2002 and 2003**

	2002 value in millions of dollars	2003 value in millions of dollars
Canadian exports to China	4,093	4,761
Chinese imports from Canada	5,695	6,128
Difference	1,602	1,367

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004.

Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MIE2005003.

**Table 1b: Chinese exports compared with Canadian imports, 2002 and 2003**

	2002 value in millions of dollars	2003 value in millions of dollars
Chinese exports to Canada	6,758	7,890
Canadian imports from Chinese	15,978	18,571
Difference	9,220	10,681

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004.

Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MIE2005003.

Differences in official trade statistics reflect conceptual, definitional and reporting differences of the countries involved. Trade reconciliation studies identify and quantify the causes of these differences.

It is important to note that the results of the study do not constitute revisions to either country's official statistics. However, the additional information helps both nations recognize limitations of the published data, and helps to facilitate more objective policy discussion between the governments involved.

1. Throughout this article all currency is in Canadian dollars.

## Reconciliation study

Canada and China have undertaken a merchandise trade reconciliation study, covering 2002 and 2003. This study builds on the first Canada-China study which covered 1998 to 2001. Because of the close economic link between China and Hong Kong, some Hong Kong trade data were used in both studies.

The 2002/03 study identified the major differences in the trade data between Canada and China. It also calculated estimates to better reflect the actual trade occurring between the two countries. Overall, indirect trade was the primary cause of the differences found in data between the two countries.

### Import data more reliable than export data

Both Canada and China derive their trade statistics from administrative data provided by their respective customs agencies. Customs offices are generally more attentive to goods entering the country as opposed to leaving because of the requirements of tariff and tax assessments and the application of trade agreements.

Consequently, import data are usually more reliable than export data. Generally, exports to country A reported by country B should not exceed imports from country B reported by country A.

Canada's two-way trade with China, as reported by Canada, reached \$23.3 billion in 2003, up 16% from the previous year. Canadian trade with China was import-driven with imports representing almost 80% of total trade. Both imports and exports increased by 16% over the previous year: imports grew from \$16 billion to \$18.6 billion and exports from \$4.1 billion to \$4.8 billion.

China reported that its total trade with Canada increased 13% from \$12.5 billion in 2002 to \$14 billion the following year. Exports accounted for roughly 56% of all trade with Canada. In the two years under study, exports increased 17% from \$6.8 billion to \$7.9 billion and imports were up 18% from \$5.7 billion to \$6.1 billion.

### Significant differences between trade figures

There were significant reported differences between Canadian and Chinese trade figures. According to the official statistics, Canadian imports from China (as reported by Canada) were 2.4 times greater than what China reported as their exports to Canada.

The difference between Canadian-reported imports from China and Chinese-reported exports to Canada increased, in absolute terms, from \$9.2 billion in 2002 to \$10.7 billion in 2003.

In the westbound trade, Chinese-reported imports from Canada were 1.3 times higher than Canadian-recorded exports to China. In absolute terms, the gap narrowed from \$1.6 billion in 2002 to \$1.4 billion in 2003.

## Sources of discrepancy

### Indirect trade main source of discrepancy

The study identified indirect trade as the main source of discrepancy between Canadian and Chinese trade statistics in both directions of trade.

A substantial portion of Canada-China merchandise trade is indirect. Slightly over one-third of Canadian-reported imports from China include indirect trade in both 2002 and 2003.

In the opposite direction, 22% of Chinese-reported imports from Canada were indirect in 2002, as were 17% the following year. Hong Kong and the United States are the principal economies involved. Well over half (57%) of the estimated eastbound indirect trade in 2002/03 went through the United States. In the westbound flow, almost 80% of the estimated indirect trade was through Hong Kong.

For most countries, export trade statistics are allocated to the country of final destination as known at the time of shipment. However, trade and transportation patterns can be complex and can involve one or more intervening countries en route to a final destination. Attributing trade to a country that is not the final destination of goods results in a situation in which the two partner countries credit trade to different countries. This is known as **country misallocation**.

For example, Canada may ship goods through Hong Kong to China, the final destination. However, as the final destination may not be known at the time of export, Canada may report this trade as being with Hong Kong rather than with China.

Meanwhile China, the last country that received the goods, will allocate this trade to Canada because the trade data are compiled on a country of origin basis. This creates a statistical imbalance.

Based on the findings of this reconciliation study, it is clear that export trade was understated in both directions.

Both Canada and China report direct and indirect trade in their import statistics. However, while China reports direct and indirect trade in its export statistics, Canada does not.

Indirect trade adjustments are applied to the partner country's export figures. This is the estimated amount of misallocated trade.

## **Control adjustment eliminates double counting**

Canadian export statistics do not separately record indirect trade and direct trade. Consequently, indirect trade data taken from the Chinese statistics were added to Canadian export figures.

This sometimes resulted in Canadian exports exceeding the reported Chinese imports, implying that the export adjustment is too large because of double counting. Accordingly, the adjustments are reduced by a 'control' factor to ensure that adjusted Canadian exports do not exceed Chinese reported imports. In the westbound flow, the estimates for the 'control' values were \$144 million in 2002 and \$44 million the following year.

## **Price mark-ups complicate analysis**

Indirect trade further complicates the analysis of trade data because of the likelihood of a **price mark-up**. For the purposes of this study, it was assumed that goods imported into a country, and subsequently re-exported, show a higher value than those same goods imported for domestic consumption.

This could be as a result of value added by further processing, or simply because of profit taking. In consequence, differences appear in each partner country's reported value of goods, and this leads to additional discrepancies between the country's trade statistics.

## **Hong Kong mark-up**

An adjustment for price mark-up for goods traded via Hong Kong was made in both directions of trade.

In the eastbound direction, the Hong Kong price mark-up ratio was calculated by comparing values of Hong Kong re-exports of Chinese goods to Canada with Hong Kong imports of Chinese merchandise. The estimated mark-up ratios in 2002 and 2003 were 1.43 and 1.40 respectively.

Canadian import trade via Hong Kong was adjusted to take into account the mark-up value. The amount of indirect trade attributed to the price mark-up was estimated at roughly \$900 million in each year.

The Hong Kong mark-up values were determined by taking the difference between the Canadian published imports via Hong Kong and the adjusted Canadian imports via Hong Kong. The estimated values were \$1.46 billion in 2002 and \$1.21 billion in 2003.

The final eastbound adjustment for indirect trade via Hong Kong, taking into account the Hong Kong mark-up, was \$2.2 billion in 2002 and \$1.9 billion in 2003.

In the westbound trade, the mark-up ratio for goods going from Canada to China via Hong Kong was not expected to be as high as that for trade flowing eastbound. This is because these tend to be primary goods that generally do not command a high mark-up.

Using the same methodology for the westbound trade was not feasible. Therefore, data from a Hong Kong survey was used to determine mark-up estimates for westbound trade.

Based on Hong Kong's survey methodology, the mark-up ratio for re-exports to China was used to calculate the mark-up adjustment. In 2002, this value was 1.103.

The figure for 2003 was assumed to be the same as that in 2002. To arrive at an adjustment for indirect trade via Hong Kong, the mark-up ratio was applied to the Chinese indirect imports via Hong Kong, adjusted for insurance and freight.

For reconciliation purposes, the indirect trade adjustment was amended to take into account the Hong Kong mark-up. The final westbound adjustment for indirect trade via Hong Kong was \$95 million in 2002 and \$86 million in 2003.

### **United States mark-up**

Canadian imports from China via the United States have grown significantly. According to Canadian statistics, Canadian imports from China via the United States are now greater than Canadian imports from China via Hong Kong. An adjustment for price mark-up for goods traded via the United States was made for eastbound trade only.

It is likely that goods travelling between China and Canada via the United States are also going through Hong Kong. Canada reported that nearly a quarter of its imports from China arrive via the United States. Chinese export statistics indicate that there is almost no trade with Canada via the United States.

This difference might be attributable to goods flowing from China through both Hong Kong and the United States before arriving in Canada, resulting in difficulties in identifying the last country of shipment.

If the Chinese goods that Canada reports as arriving via the United States are going through Hong Kong first, it is likely there is a Hong Kong price mark-up applied to the goods, and that this mark-up finds its way into the value of Canadian imports via the United States.

It was not possible to adequately assess mark-up values for goods moving from China to Canada via the United States using US trade data. Therefore, data from Hong Kong were used.

Hong Kong uses survey-based methodology to determine re-export mark-up ratios for trade going from mainland China to other countries. This ratio, which is not country-specific, was 1.34 in 2002. The mark-up ratio for 2003 was assumed to be the same. The indirect trade adjustments for trade via the United States take into consideration the price mark-up value.

The final eastbound adjustment for indirect trade via the United States was \$2.4 billion in 2002 and \$3.4 billion in 2003.

An adjustment for US price mark-up was not made for westbound trade. China reported that roughly 3% of this trade with Canada in 2002/03 was through the United States. While US trade data do distinguish domestic exports from re-exports, a record of the country of origin of these goods is not kept. Consequently, an adjustment to the data was not made.

The estimated mark-up values for the westbound indirect trade attributed to the United States are accounted for in the residual adjustment without any attempt to identify them from other causes of data discrepancies.

### **Other country mark-up**

No attempt was made to estimate mark-up values for the indirect trade via other countries. In most cases, data required to calculate these price mark-ups were not available. In addition, the amount of indirect trade via other countries was relatively small, less than 3% of total trade during 2002/03.

### **Goods re-exported from the partner country not included in import statistics**

In both directions of trade, an adjustment for re-exports was made. Export statistics are based on the country of final destination. This includes domestic goods, that is, goods originating in the country of export. It also includes re-exports, that is, goods of foreign origin that have entered a country's domestic consumption and are then sold without any substantial transformation occurring in that country.

Import data are based on the country-of-origin principle. Therefore, goods re-exported from China to Canada will not appear as a Chinese import in the Canadian statistics. However, they will appear as an export from China to Canada in the Chinese statistics.

Canada keeps track of goods it re-exports, while China does not. Estimates of Chinese re-exports were calculated using Canadian data.

Canadian re-exports amounted to \$493 million in 2002 and \$811 million the following year. Chinese re-exports were estimated at \$106 million in 2002 and \$139 million in 2003.



## Valuation differences between countries

The value of goods can be reported in different ways: free on board (FOB) and cost, insurance and freight (CIF). FOB basis does not include the costs incurred to ship the goods from the point of exit to the port of destination. Goods reported on the CIF principle have the costs associated with the shipment of goods to the border included in their valuation.

Canadian imports and exports are collected and published on an FOB basis. China publishes its imports on a CIF basis and its exports on an FOB basis. Therefore, an adjustment was made to compensate for the valuation differences.

While China reports imports on a CIF basis, it does not capture insurance and freight costs separately. However, the Census and Statistics Department of Hong Kong estimates insurance and freight rates for its imports. The estimated rates for 2002 and 2003 were roughly 3%. These rates were used in the adjustments in the Chinese import data. The valuation adjustment for 2002 was \$171 million; for 2003 it was \$180 million.

## Residual differences small

The remaining unexplained difference between Canadian and Chinese statistics may be due to several other factors: over or under-estimation of the reconciliation estimates, non-Hong Kong and non-US mark-ups, time lags, export undercoverage, other discrepancies not fully investigated, and any revisions made during the reconciliation study period.

In the eastbound direction, the residual values were \$1.9 billion in 2002 and \$2.7 billion in 2003. Westbound, they were \$720 million and \$905 million respectively.

The following tables summarize the various adjustments that were calculated in an attempt to better reflect the trade between Canada and China.

**Table 2a. Reconciliation of Canada-China eastbound merchandise trade, 2002 and 2003**

	2002	2003
	(millions of dollars)	
Canadian published imports from China	15,978	18,571
Indirect trade adjustment via Hong Kong	-2,212	-1,920
Indirect trade adjustment via U.S.	-2,447	-3,392
Indirect trade adjustment via other countries	-431	-417
Hong Kong mark-up adjustment	-1,463	-1,206
U.S. mark-up adjustment	-841	-1,166
Chinese re-exports adjustment	106	139
Residual adjustment	-1,932	-2,718
Chinese published exports to Canada	6,758	7,890

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004 and the Hong Kong Census and Statistics Department, 2004

Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MIE2005003.

**Table 2b: Reconciliation of Canada-China westbound merchandise trade, 2002 and 2003**

	2002	2003
	(millions of dollars)	
Chinese published imports from Canada	5,695	6,128
Indirect trade adjustment via Hong Kong	-929	-843
Indirect trade adjustment via U.S.	-245	-127
Indirect trade adjustment via other countries	-79	-81
Control adjustment	144	44
Hong Kong mark-up adjustment	-95	-86
Canadian re-exports adjustment	493	811
Valuation adjustment	-171	-180
Residual adjustment	-720	-905
Canadian published exports to China	4,093	4,761

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004 and the Hong Kong Census and Statistics Department, 2004.

Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MWE2005003.

The 2002/03 Canada - China reconciliation study points out that both sets of data required adjustments to make them comparable. Canada's trade statistics tend to overestimate the true balance between the two countries, while Chinese statistics tend to underestimate the balance.

## Canada's reconciled trade deficit smaller than reported

Canadian statistics indicated a negative merchandise trade balance of \$13.8 billion in 2003, a 16% increase from the previous year. Chinese statistics indicated a positive merchandise trade balance of \$1.8 billion for 2003, up 60% from the previous year. Both sets of official statistics show that China was in a surplus position, while Canada was running a trade deficit.

Reconciled data showed that Canada had a smaller trade deficit with China than official published Canadian numbers, while China had a larger surplus with Canada than official published Chinese statistics.

In 2002, Canada's reconciled trade deficit with China was \$8.2 billion, 31% less than what was published. The following year it was \$10.3 billion, 25% less than what was published.

**Table 3a: Canada's trade balance: published versus reconciled results, 2002 and 2003**

	Published value in millions of dollars	Reconciled value	Difference (percent)
2002	-11,885	-8,245	31
2003	-13,811	-10,337	25

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004  
Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MIE2005003.

**Table 3b: China's trade balance: published versus reconciled results, 2002 and 2003**

	Published value in millions of dollars	Reconciled value	Difference (percent)
2002	1,062	8,245	676
2003	1,762	10,337	487

Data sources: Statistics Canada, International Trade Division 2004; Customs General Administration of China, 2004  
Table source: Statistics Canada, 2005, Merchandise trade reconciliation study: Canada-China, catalogue number 65-507-MIE2005003.

## **Conclusion**

The study confirmed that the major contributing factor to the discrepancy between the Canadian and Chinese published trade data was indirect trade. Misallocated trade resulting from differences in which indirect trade is reported, as well as price mark-ups, have an impact on Canada's reported trade balance with China.

The usefulness of this reconciliation study in identifying differences has also resulted in an agreement between Canada and China to continue discussions and perhaps undertake further reconciliation work.

# Methodology

## Data sources

- Statistics Canada, International Trade Division
- Statistical Department of the Customs General Administration of China
- Census and Statistics Department of Hong Kong

## Trade data adjustment

### Indirect trade adjustment

#### Westbound

Canada does not keep separate records for goods shipped directly (direct exports) and goods shipped via intermediary economies to a partner country (indirect exports). However, Chinese import statistics are published by country of origin (COO) and by country of consignment (COC), the county or region from which the goods are dispatched to China, consequently indirect trade can be estimated using Chinese data.

Indirect trade was estimated for goods travelling via Hong Kong, via the United States and via Other economies, which included all the intermediary economies other than Hong Kong and the United States.

Estimates were based on Chinese data net insurance and freight costs using values for transactions that showed Canada (CA) as the country of origin (COO equals CA) but not as the country of consignment (COC does not equal CA).

The values for goods travelling via Hong Kong were estimated by totalling the values of Canadian import data where the country of origin was China (COO equals CN) and where the country of export was Hong Kong (COE equals HK).

#### Eastbound

In the opposite flow, Canadian data includes both COO and COE. Therefore, based on Canadian import data, values for indirect trade via the United States were estimated by totalling the values of Canadian import data where the county of origin was China (COO equals CN) and the country of export was the United States (COE equals US).

The values for indirect trade via 'Other' were estimated using the import data where the country of origin was China but the country of export was neither China, nor Hong Kong, nor the United States.

For adjustment purposes these estimates were subtracted from the published Chinese import data.

The differences between the Canadian indirect imports and the respective Chinese reported indirect exports were used to align the published data. The differences between the two figures were taken for adjustment purposes in order to reduce the incidence of double counting.

## Control adjustment

### Westbound

The eastbound estimates for indirect trade were calculated by subtracting Canada's indirect import figures from the respective Chinese indirect export figures. To some degree this limited the problem of over-estimations of the adjusted figures due to double counting. This methodology was not possible for the indirect trade adjustments in the westbound direction. While it was possible to distinguish between Chinese direct and indirect imports, this was not possible to distinguish between direct and indirect exports using the Canadian data. Canada only reports one country in its export figures, the country of last known destination. Consequently, all of China's reported indirect trade values for the respective years were included in the indirect trade adjustments. Double counting was inevitable.

A possible solution to limit the degree of double counting is to control for the occurrences where Country A's exports plus Country B's indirect imports are greater than Country B's imports.

In an ideal world, Country A's exports should equal country B's imports. However, this is generally not the case, due to indirect trade and other factors. It is often the case that the exporter does not know where the final destination of the goods will be. Consequently, the exporter indicates the intermediary country as the country of last known destination. Imports are, in general, more accurately reported than exports because of the requirements for tariff assessment and the application of trade agreements. Thus, the importing country will have a record of the country of origin and of the intermediary countries involved in the trade and these records will be reported more accurately than those of exports.

If we accept the argument that one of the primary causes of differences found between partner country trade figures is the misallocated reporting of export goods then the second best situation would be where Country A's exports plus Country B's indirect imports equal Country B's total imports. For example, Canada exports \$10 worth of goods and China reports indirect imports of \$5 and total imports of \$15. It would also be acceptable where Canada exports \$10 worth of goods and China reports indirect imports of \$2 and total imports of \$15, that is, where the sum of exports plus indirect exports is less than total imports. This would imply that while misallocated trade is a cause for the discrepancy there are still some other factors to take into consideration. However, if the sum of Canada's exports plus China's indirect imports is greater than China's total imports, (for example, if Canada's exports are \$10, China's indirect imports are reported as \$7 for a total of \$17 and China's total imports are reported as \$15), then this would indicate that some double counting is involved (i.e. \$2); Canada has captured some of the intermediary trade in its statistics but not all of it.

An attempt was made to control for double counting in the westbound trade using this premise. The following steps were taken:

1. The Chinese reported import values were adjusted for insurance and freight by applying the estimated insurance and freight rates, at the two digit HS level, to the corresponding commodities;
2. For adjusted Chinese imports greater than Canadian domestic exports ( $CN^{adjM} > CA^{DX}$ ) the adjusted Chinese reported indirect imports were added to the Canadian reported domestic exports ( $CN^{adjIndM} + CA^{DX}$ ) and compared to the adjusted Chinese total imports ( $CN^M$ );
3. Residuals (R) were calculated for  $CN^{adjIndM} + CA^{DX} > CN^M$ , where R equals  $CN^{adjM} - (CN^{adjIndM} + CA^{DX})$ ;
4. The residuals were added together to determine a 'control' value.

### Price mark-up adjustment

Hong Kong mark-up

Eastbound

Estimates for the Hong Kong mark-up values were made using data provided by the Hong Kong Census and Statistics Department. For re-export purposes, the department collects data concerning the two countries involved in the re-exports of goods through its economy, namely country of origin and country of destination. This proved useful when trying to determine price mark-up estimates.

To determine an estimate for Hong Kong mark-up in prices for eastbound trade, Hong Kong 's re-export data for goods of Chinese origin re-exported to Canada and Hong Kong 's reported imports from China were used. The Hong Kong mark-up ratios were calculated as follows:

$$\frac{\sum[HK^{RX}CA\ UV * HK^{RX}CA\ Qty]}{\sum[HK^M CN\ UV * HK^{RX}CA\ Qty]}$$

where at the HS 6 level:

$HK^{RX}CA\ UV$ : the unit value of the Hong Kong re-exports of goods of Chinese origin that were exported, via Hong Kong to Canada;

$HK^{RX}CA\ Qty$ : the quantity of the Hong Kong re-exports of goods of Chinese origin that were exported, via Hong Kong to Canada;

$HK^M CN\ UV$ : the unit value of Hong Kong imports of Chinese origin;

$UV$ : the unit value of the good, defined as value divided by quantity.

The commodities of the two data sets were matched at the HS 6 level. If a match was not found that commodity was not included in the calculation used to determine the mark-up ratio.

The commodities whose quantity and/or value were zero or whose unit of measure (UOM) was zero were not included in the calculations. According to Hong Kong data descriptions, a UOM of zero indicates a mixed grouping of goods, consequently a unit value for the grouping cannot be determined.

Unit values were calculated for the remaining commodities and the ratio was then calculated. The Hong Kong mark-up ratio for 2002 and 2003 were 1.43 and 1.40 respectively.

#### Westbound

Data from a Hong Kong survey was used to determine mark-up estimates for the westbound trade. This mark-up ratio was applied to the value of the Canadian published imports from China via Hong Kong to determine the adjusted values for Canadian imports via Hong Kong.

Adjusted Canadian imports via Hong Kong :

Canadian published imports via Hong Kong  
(Hong Kong mark-up ratio)

### **Re-export adjustment**

#### Eastbound

Chinese export statistics are based on country of ultimate destination and include domestic goods, i.e., goods of Chinese origin, and re-exports, i.e., goods of foreign origin that have entered Chinese consumption and have subsequently been sold without any substantial transformation occurring in China. Canadian import data is based on the country of origin principle.

The Chinese export data does not distinguish between domestic exports and re-exports. However, Canadian data documents both the country of origin (COO) and the country of export (COE) i.e., the country from which the goods are shipped directly to Canada. Consequently it is possible to estimate Chinese re-exports using Canadian data. The values for transactions that showed China as country of export (COE equals CN) but not country of origin (COO does not equal CN) were totalled and used to estimate Chinese re-exports. For the purpose of this reconciliation study, the estimated Chinese re-exports were added to the Canadian published imports.

#### Westbound

Canadian export data distinguishes domestic exports and re-exports. Therefore, Canadian export data could be used to adjust the westbound flow by adding these amounts to Chinese published imports.



## Valuation adjustment

Canada reports its exports F.O.B. (Free on Board) at the Canadian border. This method excludes insurance and freight costs from point of exit. China reports imports on a C.I.F. (Cost, Insurance, and Freight) basis, which does include all insurance and freight cost to the Chinese port of destination. Estimates of insurance and freight costs are necessary to align the respective data. While China reports imports on a C.I.F. basis it does not capture the freight and insurance costs separately. For the purpose of this reconciliation study, data from the United States Census Bureau (USCB) were used to estimate the insurance and freight costs.

The USCB records import values on both a C.I.F. and F.O.B. basis. It also collects separate records for freight and insurance. The freight and insurance ratios for each commodity at the HS2 level were estimated using the following:

Insurance and Freight ratio: 
$$\frac{\text{CIF value minus FOB value}}{\text{CIF value}}$$

The resulting ratio was then applied to the Chinese imports (C.I.F. values) to determine the F.O.B. values of Chinese imported goods at the HS2 level as follows:

Adjusted Chinese Imports equals Chinese Imports multiplied by (one minus Insurance and Freight Ratio).

There are a couple of considerations to keep in mind:

1. The insurance and freight costs apply to trade flows which are in the reverse direction from those of the Chinese import data that is; eastbound (CN to US) trade versus westbound trade (US to CN). The assumption is made that eastbound and westbound insurance and freight costs are similar.
2. The commodity trade is not necessarily the same. China does not necessarily import the same commodities from Canada that it does from the U.S. Similarly, the U.S. and Canada do not necessarily export the same type of commodities to China.

## Residual adjustment

The residual is calculated by summing all reconciliation adjustments and subtracting the total from the published import figure. It therefore largely comprises two main aspects: errors or deficiencies in the other reconciliation adjustments and export undercoverage.