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Comparing Canada's and China's bilateral trade data

Prepared by China-Canada Joint Working Group on Trade Statistics Reconciliation

At the 26th meeting of the China-Canada Joint Economic and Trade Committee held in January 2016, Canada expressed a desire to conduct a joint study on the differences or asymmetries between the trade statistics of the two countries under the mechanism of the Joint Committee. Consequently, the China-Canada Joint Working Group on Trade Statistics Reconciliation was established in Ottawa in August 2016.

The objectives of the Working Group are to further explain and quantify the differences in the statistical data of the two countries and to carry out an in-depth analysis of the origins of these differences. This Working Group is a cooperative consultative mechanism under the Joint Committee that conducts joint verification studies and exchanges opinions on the issue of asymmetries in trade statistics. The Chinese member organization is the Ministry of Commerce, then later the General Administration of Customs, and the Canadian member organizations are Global Affairs Canada and Statistics Canada.

Over the next two years, Statistics Canada and the Ministry of Commerce of the People's Republic of China (MOFCOM) exchanged and compared bilateral trade in goods and services data for reference years 2014 to 2016. Through data exchanges and consultations, the two organizations identified and discussed the various reasons for the asymmetry in their trade data.

This paper presents the results of the trade in goods data first, followed by the trade in services data. This discussion includes detailed studies on concepts, definitions, data sources, coverage, statistical compilation, frequency of publication, and other major sources of asymmetry.

1. Trade in goods

1.1 Overview

1.1.1 Background

Bilateral merchandise trade between Canada and China has grown significantly since 2001, and differences in the trade statistics of the two countries have widened in step with this growth. According to China's statistics, bilateral total trade from 2001 to 2016 grew from \$7.4 billion¹ to \$45.7 billion, while the customs basis trade balance with Canada grew from a deficit of \$680 million to a surplus of \$9.0 billion. However, according to Canada's statistics, bilateral total trade increased from \$11.0 billion to \$64.4 billion during this time period; Canada's customs basis trade deficit with China grew from \$5.5 billion to \$32.8 billion.

1.1.2 Scope

The purpose of this study is twofold: to identify the sources of the statistical differences or asymmetries in the official data of the two countries and to promote an understanding of the sources of asymmetry among data users. These asymmetries may arise from conceptual and methodological differences in the process of gathering and processing data. The focus of the study by the Working Group is to identify and quantify the major reasons for the differences in bilateral trade statistics as well as to demonstrate how adjusting for these more closely aligns the two sets of data. The adjustments made during the verification of data neither imply that errors exist in the trade statistics systems of either country nor indicate that a revision or correction of official data published by either country is required.

The verification scope of the study is data from 2014 to 2016, with the focus being an in-depth analysis of 2016 data, specifically considering the Harmonized Commodity Description and Coding System (Harmonized System or HS) Classification, attribution of country of origin and destination, mode of transport, trade type (re-exports, and direct trade and indirect trade), trade valuation, quantity, value, and shipment time lag.

1. All amounts in this report are in US dollars unless otherwise specified.

1.1.3 Methods

There are certain known and measurable factors that lead to differences in Canada's and China's bilateral merchandise trade statistics. Both China and Canada follow the United Nations International Merchandise Trade Statistics System, however this does not necessarily result in identical bilateral trade statistics. In fact, the application of certain international standards for the compilation of trade statistics, such as valuation methods and partner country attribution, often results in asymmetries. With regards to valuation, China uses cost, insurance and freight (CIF) valuation for its imports, which includes overseas insurance and shipment costs, while Canada uses free on board (FOB) valuation for its exports, which does not include these costs. As a result, China's value of imports is conceptually higher than Canada's value of exports.

The effect of intermediary trade, especially shipments through Hong Kong and the United States, on the comparison of data from both countries can be measured. China and Canada take the country of origin as the basis for import statistics and the known destination of exports as the basis for export statistics. With regards to trade between China and Canada involving shipment through Hong Kong, the known destination is normally reported as Hong Kong at the time of exportation. However, when the merchandise is finally imported to China or Canada, the importing country will compile statistics on the basis of country of origin rules. At this point, the reported exporter may not be Hong Kong. Similarly, a significant proportion of Canada's imports of Chinese goods are imported from the United States. Canada attributes these to the country of origin, however these shipments may be attributed to the United States in China's export statistics.

In this report, the term 'eastbound' refers to the direction of trade from China to Canada: China's exports to Canada and Canada's imports from China. The term 'westbound' refers to the direction of trade from Canada to China: Canada's exports to China and China's imports from Canada.

For the comparison of China's and Canada's eastbound and westbound trade data, after adjusting for known and measurable factors such as time lag, re-exports, and valuation, statistical differences still exist. Compared with westbound trade, the asymmetry in eastbound trade is especially marked, therefore further analysis was undertaken. The Working Group divided eastbound trade into two parts in order to study the statistical differences that occur. The first part is direct trade, where merchandise is shipped out of China and exported to Canada without stopping in another country for the purpose of a commercial transaction. The second is indirect trade, where merchandise is shipped out of China to a transfer country for the purpose of a commercial transaction and then shipped on to Canada. The following provides a detailed explanation.

1.2 Eastbound trade

Eastbound trade shows the greatest asymmetry when comparing China's and Canada's official merchandise trade statistics. In the years studied, the absolute difference between China's export statistics and Canada's import statistics lessened each year, and the relative difference (the percentage resulting from the value of the absolute difference over the value of Canada's imports from China) essentially remained consistent. For the years 2014, 2015 and 2016, the asymmetries in eastbound trade were \$23.1 billion, \$21.9 billion and \$21.3 billion with relative differences of 43.5%, 42.7% and 43.7% respectively for the corresponding years (see Table 1).

Table 1
Differences in eastbound trade statistics, 2014 to 2016

	Canada's imports	China's exports	Difference	Difference ¹
	billions of US dollars			percent
2014	53.1	30.0	23.1	43.5
2015	51.3	29.4	21.9	42.7
2016	48.6	27.3	21.3	43.7

1. Difference/Canada's imports.

Sources: Statistics Canada and the Ministry of Commerce of the People's Republic of China.

1.2.1 Differences attributable to statistical methodologies and conceptual definitions (known and measurable component)

1.2.1.1 Differences attributable to shipment time lag

The shipment time lag difference refers to the difference in bilateral statistics resulting from the shipment of commodities that begins in one year and continues into the following year, generally the result of long-distance ocean shipping. Based on dates in Canada's statistics for imports from China, statistical differences caused by time lag for the years 2014, 2015 and 2016 were \$260 million, -\$615 million and \$234 million respectively.

1.2.1.2 Differences attributable to China's re-exports

Chinese export statistics include goods that are not of Chinese origin but are re-exported from China to Canada. Canada records these goods in its statistics as imports from their country of origin and not from China.

1.2.2 Differences attributable to direct trade

There has been a marked increase in direct trade between China and Canada since 2000. According to China's statistics, the proportion of China's total exports to Canada that were traded directly during the years studied remained relatively consistent at 97% each year. However according to Canada's statistics, this proportion fell from 59.7% in 2014 to 57.6% in 2016.

Looking to the 2016 data, approximately 6.4% of the asymmetry in eastbound statistics results from direct trade.

1.2.3 Differences attributable to indirect trade

Merchandise exported from China can be shipped to Canada directly or transshipped to Canada following a commercial transaction in an intermediary country. Although China and Canada follow the principles of the United Nations regarding partner country attribution, intermediary trade can result in statistical differences and become a major source of asymmetry in bilateral trade statistics.

The process of transshipment trade can easily lead to statistical differences. Firstly, if an intermediary does not tell the exporter the actual final destination, the destination reported by some Chinese exporters may be a transshipment location whereas the merchandise will in fact finally flow to Canada. Consequently, when the Canadian importer reports the origin of the goods as China, the partner country information recorded by the two countries will not match. Additionally, merchandise may be repackaged, further processed or sold at a mark-up in a transshipment location and the resulting new increase in value will not be included in the value of China's exports but will be included in the value of Canada's imports. In this case, the export value reported to Chinese Customs will be lower than the import value reported to Canadian Customs.

According to China's statistics, 2.6% of China's exports passed through another country to Canada, almost entirely (98.2%) through Hong Kong. According to Canada's statistics, 57.6% of Chinese merchandise was shipped to Canada directly in 2016, while 42.4% passed through another country, with 34.3% from the United States and 5.3% through Hong Kong.

1.2.3.1 Differences attributable to transshipments through Hong Kong

When Chinese commodities are transshipped through Hong Kong to Canada, Canada records these shipments of goods, along with the possible increased value, as imports from China, provided that no substantive change to the nature of the commodity occurs in Hong Kong. In addition, there are also goods that are reported to Chinese Customs as exports to Hong Kong when in fact they are finally exported to Canada. Adjustments need to be made to account for these two aforementioned situations.

According to Canada's statistics, Canada imported \$2.6 billion of Chinese commodities through Hong Kong in 2016. According to China's statistics, commodities shipped through Hong Kong to Canada amounted to \$704 million. The difference between Canada's and China's values of eastbound shipments through Hong Kong in 2016 was therefore \$1.9 billion, which represented 8.8% of the total eastbound asymmetry.

1.2.3.2 Differences attributable to transshipments through the United States

Similarly, the United States is often a country through which goods are shipped from China to Canada. According to Canada's statistics, Canada imported \$16.7 billion of Chinese commodities from the United States in 2016. China's statistics, on the other hand, showed that \$8.2 million of Chinese goods had been shipped through the United States. The difference between Canada's and China's values of eastbound shipments through the United States in 2016 was therefore \$16.7 billion, which represented 78.3% of the total eastbound asymmetry.

1.2.3.3 Differences attributable to transshipments through other countries

According to Canada's statistics, Chinese commodities imported through countries other than Hong Kong and the United States were valued at \$1.4 billion whereas according to China's statistics, commodities transshipped to Canada through regions other than Hong Kong and the United States were valued at \$4.6 million. On the basis of these calculations, the difference between Canada's and China's values for eastbound shipments through countries other than Hong Kong and the United States was \$1.4 billion, representing 6.5% of the total eastbound asymmetry.

1.2.4 Results of adjustments for differences in eastbound trade statistics

Bringing together the results of the foregoing study, the Working Group adjusted for the differences in bilateral eastbound trade statistics as follows (see Table 2):

Table 2
Results of adjustments for differences in eastbound trade statistics, 2016

	Canada's imports	China's exports
	billions of US dollars	
Published data	48.6	27.3
Published asymmetry	...	21.3
Adjustments		
China's re-exports	...	0.2
Indirect trade		
Transshipments through Hong Kong (China)	2.6	...
Transshipments through United States	16.7	...
Transshipments through other countries	1.4	...
Shipment time lag	0.2	...
Data after adjustment	28.2	27.2
Remaining asymmetry	...	1.0
	percent	
Difference ¹	...	2.2

... not applicable

1. Remaining asymmetry/Canada's imports

Sources: Statistics Canada and the Ministry of Commerce of the People's Republic of China.

1.3 Westbound trade

Both the values of westbound trade and the asymmetry in westbound trade are lower than eastbound trade. In the years studied, the average westbound asymmetry was less than \$7.0 billion, while the average eastbound asymmetry was three times that amount, at approximately \$22.1 billion. Although the asymmetry in westbound trade is smaller than the asymmetry in eastbound trade, it continues to make up a large proportion of westbound trade and only began to decline in recent years. In 2014 and 2015, the westbound relative difference (the percentage resulting from the value of the absolute difference over the value of China's imports from Canada) was 30.7% and 39.9% respectively, but in 2016 it fell to 13.6% (see Table 3).

Table 3
Differences in westbound trade statistics, 2014 to 2016

	China's imports	Canada's exports	Difference	Difference ¹
	billions of US dollars			percent
2014	25.2	17.5	7.8	30.7
2015	26.2	15.8	10.5	39.9
2016	18.3	15.8	2.5	13.6

1. Difference/China's imports.

Sources: Statistics Canada and the Ministry of Commerce of the People's Republic of China.

1.3.1 Differences attributable to statistical methodologies and conceptual definitions (known and measurable component)

1.3.1.1 Differences attributable to shipment costs

China uses CIF valuation to calculate values for its import statistics, which includes overseas insurance and shipment costs. Canada uses FOB valuation to calculate values for exports, which does not include these costs. According to estimates by China's State Administration of Foreign Exchange (SAFE), the transportation and insurance rates for imports from Canada in 2016 were 6.6% and 0.5% respectively. Based on this, the difference resulting from trade valuation in 2016 was \$1.2 billion.

1.3.1.2 Differences attributable to Canada's re-exports

Canada's export statistics include goods that are not of Canadian origin but are re-exported from Canada to China. China records these goods in its statistics as imports from their country of origin and not from Canada. Adjusting for the value of Canada's re-exports of foreign origin goods more closely aligns Canada's export value with China's value of imports from Canada. In 2016, according to Canada's statistics, the value of westbound re-exports was \$624 million.

1.3.2 Results of adjustments for differences in westbound trade statistics

Bringing together the results of the foregoing study, the Working Group adjusted for the differences in bilateral westbound trade statistics as follows (see Table 4):

Table 4
Results of adjustments for differences in westbound trade statistics, 2016

	China's imports	Canada's exports
	billions of US dollars	
Published data	18.3	15.8
Published asymmetry	...	2.5
Adjustments		
Canada's re-exports	...	0.6
Indirect trade		
Transshipments through other countries	3.5	...
Trade valuation	1.2	...
Data after adjustment	13.6	15.2
Remaining asymmetry	...	-1.6
	percent	
Difference ¹	...	-8.5

... not applicable

1. Remaining asymmetry/China's imports

Sources: Statistics Canada and the Ministry of Commerce of the People's Republic of China.

1.4 Other differences

1.4.1 Differences attributable to classification of commodities

China compiles its Commodity Classification Catalogue for Customs Statistics on the basis of the Harmonized System established by the World Customs Organization and in consideration of the kinds of goods that are imported and exported. China divides commodity imports and exports into 98 chapters. Chinese customs statistics for imports and exports include all goods. Commodity imports recorded as single items valued at less than 2,000 renminbi and not subject to tariff or certificate requirements are listed in Chapter 98.

Canada also classifies commodities according to the Harmonized System. Although Canada divides commodities into 99 chapters, the first 97 chapters of its classification are aligned with China's classification, using the same 6-digit HS codes. Canada includes all import transactions regardless of value under the appropriate HS code, but for exports, transactions recorded as a single item valued at less than CA\$2,000 are not included. The differences due to the application of the commodity classification are not a major source of asymmetry.

1.4.2 Exchange rate factor

China's trade values are captured in renminbi and American dollars; exchange rate fluctuations may therefore also lead to statistical differences. Canada's trade values are captured in Canadian dollars. For the purpose of this study, Canada's trade values were converted to US dollars using the Bank of Canada's monthly average noon spot rate.

1.5 Conclusions

Through the comparative study of China's and Canada's bilateral merchandise trade data, the Working Group was able to address the major sources of asymmetry and to make adjustments for measurable differences where possible. The conclusions of the study are as follows:

1.5.1 Although the absolute scale of bilateral asymmetries is expanding, the asymmetries as a proportion of trade are declining.

Between 2014 and 2016, although the absolute scale of bilateral asymmetries expanded, relative differences (differences as a proportion of trade values) appear to be declining. In 2016, the bilateral statistical differences in China's statistics represented 52.0% of the value of trade, while for Canada's statistics, it represented 36.9%, a decline of 3.9 and 6.8 percentage points respectively over 2014.

1.5.2 Eastbound differences comprise a larger share of the total asymmetry.

In 2016, for both eastbound trade (China's exports to Canada and Canada's imports from China) and westbound trade (China's imports from Canada and Canada's exports to China), the value of imports in the statistics of either one of the countries was greater than the value of exports in the other's statistics. The asymmetries in eastbound and westbound statistics were \$21.3 billion and \$2.5 billion respectively. The asymmetry in eastbound trade accounted for 89.5% of the total asymmetry while the westbound asymmetry accounted for 10.5%. Consequently, the Working Group provided additional analysis for the reconciliation of eastbound trade.

1.5.3 The major findings of the Working Group in its analysis of the sources of asymmetry in eastbound trade statistics are as follows:

- The differences resulting from direct eastbound trade (where the goods are shipped from China and delivered to Canada without undergoing a commercial transaction in another country) account for 6.4% of the total eastbound difference. It is possible that the same shipment of goods has a lower declared export value in China than the declared import value in Canada.

- Indirect trade and the possible resulting increase in value are also major sources of differences. Although the share of indirect trade in eastbound trade has been declining in recent years, the differences engendered by such trade still account for over 90% of the total asymmetry, with shipments through Hong Kong and the United States having the greatest impact on the differences in the bilateral trade in goods data.
- Asymmetries also arise from differences in statistical methods and conceptual definitions in the processing of data, such as shipment time lag and China's re-exports, among others. With all these factors taken together, the net effect on bilateral eastbound and westbound asymmetries is not significant.

1.5.4 Differences in westbound trade statistics constitute a small proportion of the total asymmetry.

The values of westbound trade and the asymmetry in the two countries' data account for a relatively small proportion of the value of total trade and the total asymmetry. There is a lack of data on transshipments, shipment time lags and other sources of asymmetry in westbound trade. Therefore, the Working Group addressed statistical methods and conceptual definitions as sources of statistical differences in westbound trade that were identifiable and measurable. The results indicate that the asymmetry caused by differences in the valuation methods of the two countries (CIF valuation for China's imports and FOB valuation for Canada's exports) account for a portion of the difference in westbound trade but after accounting for Canada's re-exports of foreign origin goods to China, the effect on the total asymmetry is very small.

2. Trade in services

International transactions in services are becoming increasingly important, growing at a faster rate than trade in goods over the past years. According to the World Trade Organization (WTO), the ratio of global exports of goods to gross domestic product (GDP) decreased from 22.7% in 2010 to 20.9% in 2016, while for trade in services, it increased from 5.8% to 6.4% during the same period.

In general, measuring international trade in services is a more difficult exercise for compilers than measuring international merchandise trade. National authorities control products that enter or leave the domestic economy, but this is generally not the case for services. Unlike merchandise, services are usually not subject to tariffs or other restrictions when exchanged between countries. Increasingly services are transacted digitally adding to the measurement challenges. Finally, while merchandise trade is subject to a very detailed product classification (referred to as the Harmonized System), definitions regarding trade in services are not as precise and widely known by service traders.

As a result, data sources, classifications, and methodologies used by countries to produce estimates on international trade in services often diverge. Comparing bilateral trade in services data and quantifying the sources of asymmetries is therefore usually more difficult and complex than with bilateral trade in goods data.

In this context, Canada and China have undertaken discussions to compare their bilateral trade in services data with the objective of identifying the size and possible sources of differences between their published statistics. Both countries exchanged information on conceptual and methodological approaches involved in the collection and compilation of services trade statistics in recent months. This report summarizes the findings of this work.

2.1 Classifications, concepts and definitions

Canada and China both produce trade in services statistics that are compatible, in general, to the internationally recognized Extended Balance of Payments Services Classification (EBOPS) as defined in the *Balance of Payments and International Investment Position Manual, sixth edition (BPM6)* and the *Manual on Statistics of International Trade in Services, 2010 (MSITS 2010)*. Both manuals have been published under the supervision of several international organizations, such as the International Monetary Fund (IMF) and the WTO, and representatives from several countries participated in their elaboration.

In particular, the *MSITS 2010* outlines the concepts and definitions related to international trade in services as well as other ways to estimate trade in services, such as the supply of services by mode. Statistics on trade in services by mode of supply, which provide insight into how services are provided and/or consumed, are not in scope for

this reconciliation exercise. However future exchanges of statistics on supply of services by mode between the two countries might be useful to better understand the linkages between both countries in the services area.

The EBOPS is divided into twelve main categories of services covering different types of activities:

1. Manufacturing services on physical inputs owned by others
2. Maintenance and repairs
3. Transport
4. Travel
5. Construction
6. Insurance and pension services
7. Financial services
8. Charges for the use of intellectual property
9. Telecommunications, computer, and information services
10. Other business services
11. Personal, cultural, and recreational services
12. Government goods and services

A more detailed classification exists but these main categories will be used for the purpose of this reconciliation exercise.

It should be noted that travel services and transport services are by nature different than any other types of services. Travel services cover the consumption of goods and services made by resident travelers while traveling in other countries. For example, when a Canadian travels to China and purchases a suit, the purchase of the suit would be included as an import of travel services and not an import of goods (clothing and accessories) on the Canadian side. Expenses by students studying abroad are also included in travel services even when these students remain outside of their home countries for more than one year.

In the case of transport services, which cover both the transport of merchandise and persons, the specificity of this service resides in the fact that ownership of the products being carried must also be included in the equation when it is time to determine which transport transactions apply to the balance of payments. By convention, since ownership of goods traded changes at the borders of the exporting countries, importers are responsible for international transport.² For instance, if a Canadian exporter pays a Chinese transport company to provide the international shipment between Canada and China, this transaction is assumed to be paid by the Chinese importer and is thus excluded from Canada's international trade in services statistics. Similarly, this transaction is excluded from China's services statistics as it involves two Chinese entities.

Finally, services include some activities related to merchandise trade and manufacturing production, such as maintenance and repairs, manufacturing services on physical inputs owned by others, and charges for the use of intellectual property.

2.2 China: sources and methods

China's State Administration of Foreign Exchange (SAFE) is responsible for the compilation and dissemination of China's balance of payments statistics in accordance with the sixth edition of the *Balance of Payments and International Investment Position Manual, sixth edition (BPM6)*. The Department of Trade in Services at MOFCOM, established in 2006, is in charge of compiling and releasing service statistics.

As recommended in the *BPM6*, China records merchanting activities as trade in goods and includes estimates of manufacturing services under the category of trade in services. China does not, however, include Financial Intermediation Services Indirectly Measured (FISIM) in services; this component resides in their investment income estimates.

2. See MSITS 2010, paragraph 3.98: All freight costs up to the customs frontier of the economy of the exporter are shown as incurred by the exporter. All freight costs beyond the customs frontier of the economy of the exporter are shown as incurred by the importer. In practice, whether these costs are considered to be imports or exports of freight services depends on the residence of the freight operator.

The International Transactions Reporting System (ITRS) is one of the main data sources for China's services statistics; the data in ITRS are acquired from transactions that have occurred at different banks. In addition, data are collected from a sample survey (for example, cross border bank transactions) with estimates.

In terms of travel transactions, China began in 2016 to use ITRS to record international remittances, credit and debit cards transactions, and cash expenses. Card transactions and international remittances data are collected by SAFE, and cash expenses are estimated based on an annual survey of total expenses by individual travelers. The same statistical method has been applied retroactively for reference years 2014 and 2015. Moreover, ITRS transactions that are reported as travel but are actually investment transactions, such as property purchases and investment-related insurance products, have been reassigned to the appropriate accounts based on the available information.

2.3 Canada: sources and methods

In Canada, Statistics Canada is responsible for the compilation and dissemination of the balance of payments statistics. Data are published on the basis of the *BPM6* standards with some exceptions that are usually due to limited data sources.

Among these exceptions are data on merchanting, which are still included under services rather than trade in goods. Additionally, estimates for manufacturing services do not yet exist. Statistics Canada launched a new survey in 2018 on globalization activities that could eventually provide some estimates for such activities. Finally, goods procured in foreign ports are not separated from other transport expenses and do not appear under trade in goods as recommended by international standards.

The main source of data used to estimate Canada's international trade in services is an enterprise survey. For transport services, some models, mostly linked to merchandise trade statistics, provide further estimates. For travel services, a combination of a survey on spending by travelers and frontier counts are used to produce the estimates. Administrative data provide supplementary information on transactions between affiliated parties and for payments of some services. These administrative data are merged with survey results to produce a more complete estimation of other services. The use of the Canadian centralized business register simplifies the concordance between the different data sources reducing the risks of double counting. Aggregate data exchanges with other countries, in particular with the United States, completes the portrait.

Statistics Canada publishes quarterly statistics on trade in services at an aggregate level with supplementary details produced annually.

2.4 Comparison of data sources: strengths and limitations

Data sources used by China and by Canada in the compilation of their trade in services statistics have strengths and limitations.

For China, the main advantage of the ITRS data is its capacity to produce timely statistics. ITRS is also cost-effective in comparison to a survey approach. In addition, there is usually a relatively small number of data providers (the banks) and these providers are regulated by the national central bank. ITRS does not include a threshold and therefore has complete coverage of transactions, even small ones.

On the other hand, misclassification can possibly be an issue with ITRS statistics and the large number of transactions makes it difficult to validate them all. ITRS transactions are recorded on a cash basis rather than on an accrual basis as recommended in the international standards. Transactions from which payments are made outside of the national banking system are, *de facto*, ignored by ITRS. Cash payments (although more frequent for travel expenses) and payments that do not cross the border might not be covered, however the data omitted from these two sources could be imputed from survey or other estimates.

Surveys are usually more detailed than ITRS. They contain definitions and other information that help respondents provide the correct information and surveys can be modified to better respond to new data requirements. However, surveys have to be completed by respondents, putting the weight of response burden on them. Information required might be difficult to obtain by the respondents. The quality of the estimates is highly dependent on the respondents' cooperation and overall response rate. Another issue regarding surveys is the

capacity to correctly identify the targeted population. While it is generally easier to identify units exporting trade in services (since they have first to produce them), it becomes more complex to properly identify importers of services.

Finally, administrative data (other than ITRS) usually provide good coverage and do not increase response burden, but also have some limitations. Administrative data are often not designed for statistical purposes. Information collected may not correspond to balance of payments requirements. Transactions are not necessarily validated by entities responsible for the collection and the data sources could be modified or even stopped without consultations with data compilers.

2.5 Overview of China's statistics on trade in services

According to MOFCOM's statistics, China's total trade in services (imports plus exports) reached \$661.6 billion in 2016, of which exports were \$209.5 billion while imports were \$452.1 billion, resulting in a trade in services deficit of \$242.6 billion (see Table 5). The top three deficit categories were related to larger payments of travel, transport, and the use of intellectual property.

Canada accounted for a very small share of China's total exports of services in 2016 (0.8%). Travel expenses by Canadians in China represented the largest share (43.2%) of all exports of services to Canada. On the import side, Canada accounted for 5.7% of China's total imports of services. Over 9% of all Chinese travel expenses were made in Canada in 2016.

Table 5
China's trade in services, 2016

	Exports		Imports	
	Total	Canada	Total	Canada
	billions of US dollars			
Services	209.5	1.7	452.1	25.9
Manufacturing services on physical inputs owned by others	18.5	0.1	0.2	0.0
Maintenance and repair services, not included elsewhere	5.2	0.0	2.0	0.0
Transport	33.8	0.4	80.6	1.5
Travel	44.4	0.7	261.1	23.7
Construction	12.7	0.0	8.5	0.0
Insurance and financial services	7.2	0.1	14.9	0.1
Charges for the use of intellectual property, not included elsewhere	1.2	0.0	24.0	0.1
Telecommunications, computer, and information services	26.5	0.1	12.6	0.1
Other business services	58.0	0.4	43.2	0.5
Personal, cultural, and recreational services	0.7	0.0	2.1	0.0
Government goods and services, not included elsewhere	1.2	...	2.9	...

... not applicable

Source: Ministry of Commerce of the People's Republic of China.

2.6 Overview of Canada's statistics on trade in services

Canada recorded a services deficit of \$17.6 billion (see Table 6) in 2016. Similar to China, the bulk of this deficit is explained by travel and transport services. China represented a relatively small trading partner for Canada in terms of services in 2016, accounting for 2.9% of all exports and 1.9% of all imports. For Canada's travel receipts only, China accounted for over 8% of the activity. Statistics Canada has undertaken a review of its data sources and methodologies in the area of travel services in recent months, including travel with China, and it is expected that this share will be larger when revisions to Canadian travel estimates are published in 2019.

Table 6
Canada's trade in services, 2016

	Exports		Imports	
	Total	China	Total	China
	billions of US dollars			
Services	82.1	2.4	99.7	1.9
Manufacturing services on physical inputs owned by others
Maintenance and repair services, not included elsewhere	1.6	0.0	0.9	0.0
Transport	12.1	0.4	20.0	1.0
Travel	18.0	1.5	28.7	0.5
Construction	0.5	...	0.4	0.0
Insurance and financial services	9.5	0.0	11.8	0.0
Charges for the use of intellectual property, not included elsewhere	4.2	0.1	10.6	0.0
Telecommunications, computer, and information services	7.4	0.1	4.9	0.0
Other business services	25.6	0.2	19.5	...
Personal, cultural, and recreational services	2.0	...	2.1	...
Government goods and services, not included elsewhere	1.2	0.1	0.9	0.0

... not applicable

Source: Statistics Canada.

2.7 Bilateral trade comparisons

In this report, the term 'eastbound' refers to the direction of trade from China to Canada: China's exports to Canada and Canada's imports from China. The term 'westbound' refers to the direction of trade from Canada to China: Canada's exports to China and China's imports from Canada.

For eastbound trade, bilateral trade in services estimates are very close. For both 2015 and 2016, China's exports to Canada were \$1.7 billion while Canada's imports from China were \$1.9 billion.

The largest difference in eastbound trade for 2016 was in transport services for which Canada had imports of \$1.0 billion compared with China's exports of \$0.4 billion. This was partially offset by China's exports of travel services at \$0.7 billion compared with Canada's imports of \$0.5 billion.

For westbound trade, the asymmetry is much more significant. China's imports from Canada were \$21.0 billion in 2015 and \$25.9 billion in 2016. On the other hand, Canada's exports to China were \$2.1 billion in 2015 and \$2.4 billion in 2016. While some differences were observed in transport services (China's payments of \$1.5 billion in 2016 compared with \$0.4 billion for Canada's receipts), the main source of discrepancy was travel services.

China recorded imports of travel services from Canada of \$18.1 billion in 2015 and \$23.7 billion in 2016. China's payments to Canada are approximately fifteen times larger than Canada's corresponding receipts from China.

A more detailed analysis of the potential sources of asymmetries in travel and transport services is included later in this report.

Table 7
Canada's and China's bilateral trade in services, 2016

	Westbound trade		Eastbound trade	
	China	Canada	China	Canada
	billions of US dollars			
Services	25.9	2.4	1.7	1.9
Manufacturing services on physical inputs owned by others	0.0	...	0.1	...
Maintenance and repair services, not included elsewhere	0.0	0.0	0.0	0.0
Transport	1.5	0.4	0.4	1.0
Travel	23.7	1.5	0.7	0.5
Construction	0.0	...	0.0	0.0
Insurance and financial services	0.0	0.0	0.1	0.0
Charges for the use of intellectual property, not included elsewhere	0.1	0.1	0.0	0.0
Telecommunications, computer, and information services	0.1	0.1	0.1	0.0
Other business services	0.5	0.2	0.4	...
Personal, cultural, and recreational services	0.0	...	0.0	...
Government goods and services, not included elsewhere	...	0.1	...	0.0

... not applicable

Sources: Statistics Canada and the Ministry of Commerce of the People's Republic of China.

2.8 Trade in services with China as reported by other countries

Canada's trade in services data with China can be compared with other countries' data in order to get a sense of how Canada compares internationally with respect to the intensity of trade with China and to provide insights on the quality of Canadian estimates relative to other countries.

Table 8 presents a list of the countries with the largest imports of services from China for 2016, as reported by these countries to the Organisation for Economic Co-operation and Development (OECD). A few observations can be made when comparing Canada's trade data with other countries' data. Canada shows the largest proportion of imports related to transport services (slightly more than half). Canada's travel payments are also relatively lower in comparison with some European countries.

Table 8
Imports from China by selected countries, 2016

	All services	Of which: travel	Of which: transport
	billions of US dollars		
Hong Kong (China) ¹	28.6	7.1	3.9
South Korea	16.1	3.1	3.7
United States	16.1	4.5	4.4
Japan	10.4	2.3	1.5
Germany	8.5	0.7	2.0
France	6.9	0.3	1.8
Netherlands	3.5	0.1	0.4
United Kingdom	2.3	0.6	0.6
Italy	2.2	0.8	0.4
Russia	2.0	0.9	0.1
Australia	1.9	1.0	0.6
Canada	1.9	0.5	1.0

1. Reference period 2015.

Source: OECD database.

Table 9 includes the same type of information but for exports of services to China in 2016, based on data reported by these countries to the OECD. Again, a few observations can be made.

When comparing Canadian and US data, Canada's travel exports are relatively low compared with the corresponding US figures. In 2016, the United States Census Bureau reported that 3.0 million visitors from China entered the United States. In comparison, 0.6 million Chinese visitors entered Canada in 2016. While Canada received five times less travelers from China than the United States, Canada's estimates of travel expenses by Chinese visitors were 20 times lower than the US estimates.

Table 9
Exports to China from selected countries, 2016

	All services	Of which: travel	Of which: transport
	billions of US dollars		
United States	54.2	30.7	4.9
Hong Kong (China) ¹	40.1	28.6	6.2
Japan	20.9	10.3	3.9
South Korea	20.6	10.3	5.6
Germany	14.0	3.1	2.4
Australia	8.4	7.5	0.4
France	5.1	1.0	1.6
United Kingdom	4.5	1.6	0.9
Ireland	4.3	0.0	0.0
Netherlands	2.5	0.2	0.5
Canada	2.4	1.5	0.4

1. Reference period 2015.

Source: OECD database.

2.9 Asymmetries in transport services

For transport services, both Canada and China show higher payments than the counterpart receipts. This could be due to the difficulty importers may have with properly allocating payments geographically. The difference between the country of operation, the country of ownership, and the country of registration for the same fleet often makes this more difficult.

1. Westbound trade (billions of dollars)

- China = 2.2 (2015) and 1.5 (2016)
- Canada = 0.4 (2015) and 0.4 (2016)

2. Eastbound trade (billions of dollars)

- China = 0.4 (2015) and 0.4 (2016)
- Canada = 1.0 (2015) and 1.0 (2016)

For China, approximately 60% of both receipts and payments of all transport services with all countries are related to sea transport, while for Canada these percentages (for all countries) are in the range of 20% for transport receipts and 40% for transport payments.³ At the world level, Chinese fleet (national and foreign flag combined) is ranked third in terms of dead-weight tonnage⁴ while Canada is ranked 29th.

In 2015, 90% of all Chinese imports of Canadian origin goods imported from Canada were by water. Imports by air accounted for virtually all the rest. On the other hand, 67% of all Canadian imports of Chinese origin goods imported from China were by water. A large proportion (23%) of Chinese goods entering Canada by road first transits through the United States.

According to China's current statistical method, freight services, a component of transport services, are calculated by multiplying freight values by coefficients to calculate freight rates, which include part of the goods carried by non-Canadian transportation companies in the statistical base of imports of transportation services from Canada.

On the Canadian side, due to incomplete survey coverage, merchandise trade movements are often used for the distribution of several transport series. Consequently, there is likely an over-estimation of Canadian payments made to China for transport services due to the large values of imports sourced from that country.

It is therefore likely that both countries over-estimate their payments of transport services vis-à-vis the other country and these values should be closer to receipt values reported by both China and Canada.

3. Source: Statistics Canada, table 36-10-0005-01 (<https://www150.statcan.gc.ca/t1/tbl/en/tv.action?pid=3610000501>) International transactions in services, transportation by category, annual.

4. Source: Review of Maritime Transport, 2017, United Nations Conference on Trade and Development.

2.10 Asymmetries in travel services

The largest difference between Canada's and China's bilateral trade in services data resides by far in travel services, more specifically on the westbound side (China's payments to Canada compared with Canada's receipts from China). Indeed, for westbound trade, China's estimates were more than \$22 billion higher than Canada's estimates in 2016 for travel.

1. Westbound trade (billions of dollars)

- China = 18.1 (2015) and 23.7 (2016)
- Canada = 1.2 (2015) and 1.5 (2016)

Number of Chinese visits to Canada (2016)

- Canada: non-resident travellers entering Canada, country of residence is China = 624,900
- China = not available

Number of Chinese students studying in Canada (2015 to 2016)

- Canada⁵ = 70,377
- China = not available

2. Eastbound trade (billions of dollars)

- China = 0.6 (2015) and 0.7 (2016)
- Canada = 0.6 (2015) and 0.5 (2016)

Number of travellers (2016)

- Canada: Canadian residents returning from China = 498,000 number of visits
- China: Number of oversea visitor arrivals from Canada to China = 741,000 person-times⁶

Number of Canadian students studying in China (2016)

- Canada⁷ = 3,846
- China = not available

For China, travel estimates derive from ITRS where transactions are generated from bank declarations, cross border credit and debit cards, and estimated cash expenses.

China began using cross-border bank card data in 2016 in order to estimate international travel imports. China also adjusted and revised its estimates of international travel imports using ITRS for cash purchases made by Chinese residents while travelling abroad, including reference years 2014 and 2015.

Card transactions and international remittances data are collected by SAFE and cash expenses are estimated based on an annual survey of total expenses by individual travelers. The same statistical method has been applied for retroactive adjustments of the balance of payments for 2014 and 2015. Moreover, for some transactions that were reported as travel but were actually investment, such as property purchases and insurance for financial investment purposes, adjustments have been made to the appropriate accounts based on the available information.

For Canada, travel expenses made by foreign travelers (excluding students) are derived from the Air Exit Survey. This survey is conducted at different Canadian airports and directed to foreign travelers while waiting for their departure from Canada. Estimates for education spending are generated separately by applying average spending to the number of foreign students. For Canadian travelers returning from abroad, a traveler survey is also used in combination with the number of travelers to derive spending. However, the response rate for this survey is lower than that for the air exit survey.

5. Postsecondary enrolments based on the country of citizenship.

6. National Bureau of Statistics of China.

7. For information purposes only. Source: ChinaPower (<http://www.chinapower.csis.org/>).

Canada's estimates of travel services are currently under review and will likely be revised upward in 2019. The revisions will be more significant for education services and should increase current published totals, including higher receipts from China due to more accurate information on the residency of students.

There are other developments currently in progress at Statistics Canada that could influence the bilateral travel estimates in the coming year. A new Canadian tourism survey has recently been launched and is expected to provide higher quality estimates of Canadian travel spending abroad. There are also ongoing efforts to broaden the use of payment card and credit card transactions.

In this context, data from one payment card provider have been obtained and this information is being analyzed for payments made by foreign travelers. Based on the information reviewed, spending by holders of Chinese bank cards are ranked as the second highest, only behind holders of US bank cards. An interesting finding relates to the type of spending: 17% of all Chinese expenses are made in duty free stores, but 14% are made to auto dealers and 10% to grocery stores and supermarkets, raising some concerns about limitations with respect to the use of such information to derive travel estimates (for example, travelers buying goods on behalf of other people); however these limitations would be applicable to other statistical methods.

Canada's and China's eastbound estimates of travel are relatively close. Given some recognized limitations in the Canadian data sources used to build these estimates, China's estimates are probably more accurate than Canada's estimates. For westbound estimates, on the other hand, the difference is such that using the estimates of one country over the other would not be suitable at this point without further collaboration between the two countries to better understand the nature of the data sources being used.

As mentioned earlier in this report, based on recent work conducted by Statistics Canada, Canadian travel receipts are under-estimated and will be revised. As a result, education spending by Chinese students will be revised upward in 2019. Average spending by Chinese travelers in Canada will also be revised upward as they are considered low relative to corresponding US figures. While these upcoming revisions to Canada's travel estimates with China will reduce the gap between the two countries' statistics, it will not eliminate it. China's estimates will still remain much higher than Canada's and more research will be required if both countries want to reach an agreement on the size and causes of the differences.

2.11 Conclusions

The comparison of China's and Canada's bilateral trade in services statistics has revealed that most of the asymmetries resided with travel and transport services while discrepancies for all other services remained relatively small and comparable.

It is likely that most of the transport asymmetry could be explained by the way each country estimates its geographical allocation of transport import activities. Merchandise trade movements between both countries are probably more significant than bilateral transport transactions and, for both countries, payment values should be closer to its counterpart receipt figures.

The possible causes of the large asymmetry related to westbound travel services are difficult to identify. Comparing Canada's receipts from China with similar transactions for the United States suggests that Canada's exports of travel services could be under-estimated. Expected revisions in 2019, particularly to education travel, will reduce the gap. In addition, if Canada increases its estimates to be closer to the US estimates for average receipts from Chinese visitors, Canada will still show much lower figures than China. Further work and research is required to more precisely identify causes of differences in this area of the services reconciliation between Canada and China.

Appendix

Table A.1

Comparison of statistical concepts and definitions in China's and Canada's merchandise trade statistics

	China	Canada
Trade structure	Total trade structure	Total trade structure
Valuation methods	Exports: FOB Imports: CIF	Exports: FOB Imports: FOB
	China applies the country of origin and country of destination principle to determine its trading partners. China Customs also records the countries where the shipment initiates as well as where it ends.	Canada applies the country of origin and country of destination principle to determine its trading partners.
Partner countries	Exports: Country of final destination/country of shipment ends Imports: Country of origin/country of shipment initiates	Exports: Country of final destination Imports: Country of origin/country of export
Frequency of data publication	Each month, China publishes its previous month's preliminary trade data on the 8th or 13th, and releases its official data on the 23rd.	For each reference month, Canada publishes official trade data about 35 days after the close of the calendar month.
Frequency of data adjustments or revisions	China adjusts the previous monthly data for the current year and publishes the adjusted results on the 23rd of each month. The final revisions to the previous year's data are published in October of each year.	Current year data are revised each month. Previous year data are revised in January and February, and on a quarterly basis. The previous two years of data are revised annually in February.
Commodity codes and descriptions	Goods are classified based on the Harmonized System classification. The first six digits of the HS codes are consistent with the Harmonized System, and the seventh and eighth digits are added according to the needs of China's tariff, statistics and trade management.	Goods are classified based on the Harmonized System classification. The first six digits of the HS codes are consistent with the Harmonized System, and the seventh and eighth digits for exports and imports and the ninth and tenth digits for imports are added for tariff and statistical purposes.
Special classifications	China classifies special traded goods, low-value simple customs clearance goods and unclassified goods into Chapter 98.	Canada classifies special trade, such as confidential trade and low value shipments, into chapters 98 and 99.
Re-export statistics	Re-export data are not included in China's customs statistics.	Re-exports are included in total exports and reported separately from domestic exports.
Special economic zones	Due to the preferential policies of trade and the need of customs supervision, China has a number of special regulatory areas, including: special economic zones, economic and technological development zones, high-tech development zones, bonded zones, bonded warehouses (including outbound supervision warehouses), export processing zones, bonded logistics zones, bonded port areas, bonded logistics centers (type A, type B), etc. When goods under these special zones are traded with foreign countries, these transactions are included in the customs statistics.	Goods stored in bonded warehouses are included in the customs statistics.
Freight and insurance costs	Freight and insurance premiums for imported goods are based on actual fees paid.	Freight and insurance premiums for imported goods are based on actual fees paid.

Source: Statistics Canada and the Ministry of Commerce of the People's Republic of China.