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# What's the Difference?—Comparing U.S. and Chinese Trade Data

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## Summary

The size of the U.S. bilateral trade deficit with China has been and continues to be an important issue in bilateral trade relations. President Trump and some Members of Congress view the deficit as a sign of unfair economic policies in China. In previous Congresses, legislation was introduced seeking to redress the perceived competitive disadvantage China's policies have created for U.S. exporters and import-sensitive firms.

There is a large and growing difference between the official trade statistics released by the United States and the People's Republic of China. According to the United States, the 2016 bilateral merchandise trade deficit with China was \$347.0 billion. According to China, its trade surplus with the United States was \$256.2 billion—a \$90.8 billion difference.

This report examines the differences in the trade data from the two nations in two ways. First, it compares the trade figures using the Harmonized Commodity Description and Coding System (Harmonized System) to discern any patterns in the discrepancies between the U.S. and Chinese data. This comparison reveals that nearly 90% of the difference in the value of China's exports to the United States in 2016 was attributable to five types of goods. Those five types of goods, in order of the size of the discrepancy, were electrical machinery, machinery, toys and sporting goods, footwear, and optical and medical equipment.

The second approach to examining the differing trade data involves a review of the existing literature on the technical and non-technical sources of the trade data discrepancies. The literature reveals that the leading sources of the discrepancies are differences in the list value of shipments when they leave China and when they enter the United States, and differing attributions of origin and destination of Chinese exports that are transhipped through a third location (such as Hong Kong) before arriving in the United States.

In light of the differences in the official bilateral merchandise trade data, the U.S.-China Joint Commission on Commerce and Trade (JCCT) established a statistical working group in 2004. The working group has released two reconciliation studies (in 2009 and 2012) to identify the causes of the statistical discrepancies. The Working Group stated that the adjustments contained in the two studies are not meant to imply errors in the official statistics of either country.

This report is updated annually, after the release of official trade data by China and the United States.

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## Introduction

The U.S. merchandise trade deficit with the People's Republic of China (China) remains a major source of bilateral tension. Members of Congress and other U.S. government officials often point to the bilateral trade imbalance as evidence that China is not competing fairly in the global market.<sup>1</sup>

Debate over this trade deficit is hampered by disagreement between the two countries on how large the deficit actually is. According to official U.S. figures, China has surpassed Canada as the largest supplier of U.S. imports, running up a bilateral merchandise trade surplus in 2016 of \$347.0 billion. However, according to official Chinese figures, China's trade surplus with the United States in 2016 was \$256.2 billion—\$90.8 billion less than the U.S. figure (see **Table 1**).

The size of the bilateral trade deficit also has been an issue in proposed legislation addressing trade relations with China. For example, the Emergency China Trade Act (H.R. 2909) introduced during the 112<sup>th</sup> Congress would have revoked normal trade relations (NTR) status, also known as most favored nation (MFN) trade status, for China and required the President to negotiate a trade agreement with China that would “achieve and maintain balanced trade” between the two nations within four years of the bill's enactment. As of the time this report was released, no similar legislation had been introduced in the 115<sup>th</sup> Congress.

## Comparison of U.S. and Chinese Merchandise Trade Data

**Table 1** lists the official trade statistics from the United States and China for the years 2001 to 2016, using official trade data.<sup>2</sup> According to both countries, the U.S. trade deficit with China is large and growing.<sup>3</sup> Where the two sides differ is how big the deficit is and how fast it has grown. From the U.S. perspective, its bilateral trade deficit with China more than quadrupled in value over the last 15 years, from just over \$83 billion in 2001 to over \$347 billion in 2016. However, from the Chinese view, its bilateral trade surplus with the United States increased nine-fold, from about \$28 billion in 2001 to more than \$256 billion in 2016.

**Table 1** reveals that most of the discrepancy between the trade data from the two nations stems from significantly different figures for China's exports to the United States. While the difference between the U.S. and Chinese figures for U.S. exports to China was generally less than \$10 billion until 2011, China's figures for its exports to the United States differed by \$48.3 billion in 2001 and \$74.2 billion in 2016. However, the discrepancy between U.S. export and Chinese import figures for bilateral trade has been rising in recent years.

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<sup>1</sup> Both China and the United States have substantial trade surpluses with some trading partners and trade deficits with other trading partners. Also, the phenomenon of significant difference in the trade figures between two trading partners is not uncommon. The size of the differential between China and the United States is particularly large.

<sup>2</sup> China values its exports using the “free on board,” or F.O.B. method and its imports using the “cost, insurance, and freight,” or C.I.F. method. The United States values its exports using the “free along side,” or F.A.S. method and its imports using the “Customs value” method. The implications of the different evaluation methods are discussed later in the report.

<sup>3</sup> There was a one-year decline in 2009 according to both nations' trade statistics, following the global financial crisis, and again in 2016.

**Table I. U.S. and Chinese Merchandise Trade Figures, 2001-2016**  
(billion U.S. dollars)

Year	U.S. Trade Figures			Chinese Trade Figures		
	Exports to China (F.A.S.)	Imports from China (C.V.)	Trade Balance	Exports to United States (F.O.B.)	Imports from United States (C.I.F.)	Trade Balance
2001	19.396	102.570	-83.174	54.277	26.204	28.073
2002	22.317	125.498	-103.181	69.959	27.228	42.731
2003	28.646	152.974	-124.328	92.510	33.883	58.627
2004	34.833	197.456	-162.623	124.973	44.653	80.320
2005	41.874	244.699	-202.825	162.939	48.735	114.204
2006	54.813	289.246	-234.433	203.516	59.222	144.294
2007	64.313	322.975	-258.662	232.761	69.861	162.900
2008	71.346	339.581	-268.235	252.327	81.486	170.841
2009	70.636	297.872	-227.236	220.706	77.433	143.273
2010	93.059	366.126	-273.067	283.184	101.310	181.873
2011	105.445	400.632	-295.187	324.300	118.121	206.180
2012	111.855	426.792	-314.937	351.884	127.755	224.129
2013	122.827	441.621	-318.794	368.349	145.926	222.423
2014	124.747	467.940	-343.193	396.082	159.036	237.046
2015	116.817	484.371	-367.554	409.648	148.736	260.912
2016	115.775	462.813	-347.038	388.617	132.394	256.223

**Source:** China’s General Administration of Customs, U.S. Bureau of Economic Analysis (BEA).

**Note:** China values its exports using the “free on board,” or F.O.B. method and its imports using the “cost, insurance, and freight,” or C.I.F. method. The United States values its exports using the “free alongside,” or F.A.S. method and its imports using the “Customs value” (C.V.) method.

## Delving into the Data: Examining HS Code

The most widely used international system for classifying traded goods is the Harmonized Commodity Description and Coding System, commonly referred to as the Harmonized System or simply HS Code. Every product traded is classified into a 10-digit code. The first two digits of the product’s code correspond to one of the 98 HS “chapters,” that classify all goods in general categories. The U.S. International Trade Commission maintains the U.S. version of the HS Code, officially called the “Harmonized Tariff Schedule of the United States,” or HTS. Since both the United States and China use the same HS chapters, it is possible to compare the trade data at this level.

**Table 2** lists *in rank order* the top five HS chapters where the value of U.S. imports from China exceeds the value of Chinese exports to the United States for 2016. The top five HS chapters—footwear (64), machinery (84), electrical machinery (85), optical and medical instruments (90),

and toys and sporting goods (95)—account for nearly 90% of the difference between the U.S. and Chinese figures for U.S. imports from China (or Chinese exports to the United States).

All five of these chapters also ranked high according to both countries in terms of their absolute value of trade. With the exception of optical and medical equipment, the other four were among the top five ranked chapters in terms of the value of imports from China, according to the United States, and accounted for 59.7% of the total value of imports in 2016. Three of the sources of discrepancies—electrical machinery, machinery, and toys and sporting goods—were among the top five sources of exports to the United States, according to China. All five chapters were among the top 10.

In addition to those chapters for which the U.S. figure exceeded the Chinese figure in 2016, in one notable case, the Chinese export value for knit apparel (HS61) was greater than the corresponding U.S. import value by \$1.619 billion. China reported knit apparel exports to the United States of \$16.192 billion, while the United States reported knit apparel imports from China of \$14.573 billion.

**Table 2. Top Five Discrepancies for U.S. Imports from China, 2016**  
(billion dollars)

HS Chapter	U.S. Imports from China (U.S. data, using C.V.)	China's Exports to U.S. (China data, using F.O.B.)	Difference
Electrical Machinery (85)	129.006	93.341	35.665
Machinery (84)	97.411	79.536	17.875
Toys and Sporting Goods (95)	23.796	15.011	8.785
Footwear (64)	14.820	12.202	2.618
Optical and Medical Equipment (90)	11.326	9.881	1.445

**Source:** *Global Trade Atlas*, U.S. International Trade Commission.

On the other side of the trade equation, there were five chapters where China's imports exceeded U.S. exports by more than \$1 billion, and one chapter—aircraft and spacecraft (88)—where U.S. exports exceeded Chinese imports by more than \$1 billion. China's officially reported imports from the United States of plastic (39); machinery (84); electrical machinery (85); non-railway vehicles (87); and optical and medical equipment (90) were more than \$1 billion greater than the official U.S. exports to China.

On both sides of the trade balance equation, two of the greatest differences in the official trade statistics of the two nations occurred in the same HS chapters—machinery (84) and electrical machinery (85). The discrepancies between the official trade statistics for these two types of goods have been consistently large for flows in both directions since 2001, indicating a systemic difference in the evaluation of the bilateral trade of these goods.

## Explaining the Differences: Literature Summary

The question as to why China's official statistics (on trade flows) are routinely much lower in value than the official U.S. trade statistics has been and continues to be the subject of analysis by scholars, government officials, and other interested parties. The following is a short review of some of the key explanations provided in this literature, categorized into "technical" and "non-

technical” explanations. “Technical” explanations refer to procedural or administrative causes for the discrepancies; “non-technical” explanations include causes arising from non-procedural or non-administrative sources.

## **Technical Explanations**

### **Official Definitions of Exports and Imports**

In its official statistics, China evaluates exports using the more commonly used “free on board” (F.O.B.) terms,<sup>4</sup> and evaluates imports using “cost, insurance, and freight” (C.I.F.) terms.<sup>5</sup> The United States, however, reports its exports using “free alongside” (F.A.S.) terms<sup>6</sup> and values imports using a customs definition.<sup>7</sup> As a result, official U.S. trade data place a lower value on both U.S. exports to China and imports from China than the official Chinese data. In addition, direct comparisons of the official U.S. and Chinese trade balances reported in the media are potentially misleading, because the goods trades are being evaluated using different methods. For more accurate direct comparisons, the trade data for both nations should be evaluated using the same terms. The use of F.O.B. for exports and C.I.F. for imports is a common, but not universal, international practice.<sup>8</sup>

### **Definition of Territory**

The United States includes Puerto Rico and the U.S. Virgin Islands in its trade data; China does not. China treats Puerto Rico and the U.S. Virgin Islands as separate customs territories. According to most studies, this is a comparatively minor source of difference in the trade figures.

### **Timing**

Because of the distance between China and the United States, it takes time between the export of the goods from China and their import in the United States. Goods in transit at the end of the year are counted as exports by China, but not as imports by the United States. However, the lag between shipments occurs at the beginning and the end of the year, thus minimizing the effect of timing on the overall trade balance difference.

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<sup>4</sup> “Free on board” includes the cost of getting the goods to port and loading them onto the ship; sometimes also referred to as “freight on board.”

<sup>5</sup> The C.I.F. definition adds the cost of insurance and shipping (freight) to the value of the imported goods.

<sup>6</sup> Unlike F.O.B., F.A.S. does not include the costs of clearing the goods for export and loading the goods. As a result, the FAS value of a shipment is less than its FOB value.

<sup>7</sup> The customs definition only includes the actual cost of the goods; it does not include the cost of insurance and freight. As a result the customs value of a shipment is less than its C.I.F. value. The U.S. Census Bureau does release import data using the C.I.F. definition, but like the Bureau of Economic Analysis, reports exports using the F.A.S. definition.

<sup>8</sup> The United Nations Department of Economic and Social Affairs Statistics Division, for example, recommends this practice. See “International Merchandise Trade Statistics: Concepts and Definitions,” paragraph 116 ([http://unstats.un.org/unsd/publication/SeriesM/SeriesM\\_52rev2E.pdf](http://unstats.un.org/unsd/publication/SeriesM/SeriesM_52rev2E.pdf)). Several countries, however, do not follow this recommendation, according to the United Nations International Trade Statistics Knowledgebase (<http://unstats.un.org/unsd/tradekb/Knowledgebase/Trade-valuation>).

## Declaration of Country of Origin

The current practice of U.S. Customs is to rely on the declaration of the importer to determine the country of origin. Some analysts believe that importers are misidentifying a significant amount of imports as Chinese.

## Exchange Rates

Because China's currency, the renminbi, is allowed to fluctuate within a small range, the exchange rate between the renminbi and the U.S. dollar changes over time.<sup>9</sup> The value of a shipment may change between the date it leaves China and the date it arrives in the United States due to changes in the exchange rate. Although the renminbi has appreciated against the U.S. dollar over the last decade,<sup>10</sup> exchange rate changes are not considered a major factor in the discrepancy in the trade figures.

## Non-Technical Explanations

### Value Differences in Direct Trade

According to two joint China-U.S. studies (see “Joint China-U.S. Studies of Discrepancies” below), about half of the merchandise trade discrepancy between U.S. imports from China and Chinese exports to the United States—or eastbound trade—is attributable to changes in the values of the export price in China and the import value in the United States for goods shipped directly between the two countries. Part of the difference may be caused by mid-shipment transfers in ownership resulting in the new owner adding a markup in the price. Another possible explanation is intentional under-invoicing of exports (see below).

### Under-Invoicing

Some analysts believe that Chinese importers may intentionally under-value imports from the United States to lower the import tariff due on the shipment. In addition, some analysts believe that Chinese exporters may intentionally under-value exports to the United States to maximize their net proceeds overseas for various tax and regulatory reasons. More recently, bilateral trade figures may have been distorted by “phantom goods” shipments from China to the United States (and other locations) used to disguise attempts to move financial capital offshore.<sup>11</sup> Due to the “hidden nature” of under-invoicing, it is difficult to assess how much, if at all, this may be contributing to the differences in the trade data.

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<sup>9</sup> Since June 2010, China has maintained what it calls a “managed floating exchange rate regime” that allows its currency to fluctuate within a restricted range on a daily basis. For a more detailed discussion of China's exchange rate policy, see CRS Report RS21625, *China's Currency Policy: An Analysis of the Economic Issues*, by (name redacted) and (name redacted) .

<sup>10</sup> The renminbi gradually appreciated against the U.S. dollar from January 2007 to August 2015. It has gradually depreciated since then, but remains 13.3% stronger as of March 31, 2017, than it was on January 4, 2007. For more information on the value of the renminbi relative to the U.S. dollar, see CRS Report RS22860, *East Asia's Foreign Exchange Rate Policies*, by (name redacted) .

<sup>11</sup> Enda Curran, “Phantom Goods Disguise Billions in China Illicit Money Flows,” *Bloomberg*, March 8, 2016.



## **Intermediation**

Although estimates vary, many analysts agree that a large portion of China's exports arrive in the United States via a third party, Hong Kong being the most commonly identified location.<sup>12</sup> The intermediation of shipments raises two sources of discrepancies. First, the exporter from China may not know that the goods eventually will be shipped to the United States, and may therefore list the third party (e.g., Hong Kong) as its destination, but U.S. Customs may list the source of shipment as being China, based on U.S. laws and regulations. Second, the value of the shipment may change—with or without any actual change in the goods—between its arrival in and departure from the third location. The joint China-U.S. study of discrepancies in merchandise trade statistics determined that value differences account for about half of the differences between Chinese and U.S. trade statistics.

## **Joint China-U.S. Studies of Discrepancies**

In April 2004, the 15<sup>th</sup> JCCT established a statistical working group, with representatives of China's Ministry of Commerce and General Administration of Customs, and the U.S. Department of Commerce and Office of the USTR. The initial focus of the working group was to examine the “unusually large and growing statistical discrepancies in the bilateral merchandise trade data officially published by [the] two countries.”<sup>13</sup> The Working Group subsequently decided to conduct a reconciliation study to determine the causes of the discrepancies. However, the Working Group stated that the results of the study were not intended to imply errors in either nation's statistical systems and/or methods of calculating official merchandise trade data.

Under the auspices of the U.S.-China Joint Commission on Commerce and Trade (JCCT), China's Ministry of Commerce and the U.S. Department of Commerce and Office of the U.S. Trade Representative (USTR) have conducted two studies to determine the causes of the statistical discrepancies in the official merchandise trade data reported by both nations. The first report was released in October 2009; the second in December 2012.

The main conclusions of the two studies are largely the same. The greatest discrepancy is in the “eastbound trade” data, which accounts for 80%-90% of the overall difference in annual trade balance. Roughly half of the “eastbound trade” data discrepancy can be attributed to goods that “leave China, enter the commerce of intermediate countries or regions, and then [are] re-exported to the United States.”<sup>14</sup>

## **Implications for Congress**

The release of the official U.S. annual trade figures has been frequently followed by expressions of concern about the size of U.S. bilateral trade deficit with China. According to official U.S.

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<sup>12</sup> In a 2006 study, Fung, Lau and Xiong reduced the difference between the U.S. and Chinese trade deficit for 2005 from \$87.4 billion to \$26.5 billion by adjusting the trade data for Hong Kong re-exports. In a 2005 study, Tong estimated that adjustments for re-exports resulted in a \$22 billion reduction in the trade balance difference for 2003. In an August 2013 study, Hammer, Jones, and Wang calculated that intermediation by third countries other than Hong Kong accounted for much of the remaining differences between Chinese and U.S. trade statistics after adjustments were made for valuation systems. See selected bibliography at end of report for complete citations of these studies.

<sup>13</sup> *Report of the Statistical Discrepancy of Merchandise Trade Between the United States and China*, Hangzhou, China, October 2009.

<sup>14</sup> *Ibid.*

trade figures, the bilateral trade deficit with China in 2016 was more than five times the size of the next largest bilateral trade deficit (Japan, \$68.9 billion) and greater than the sum of the next eight largest bilateral trade deficits.<sup>15</sup>

China has not accepted the “accuracy” of the official U.S. figure for the Sino-U.S. trade balance for at least two decades. A 1997 White Paper issued by China’s State Council, “On Sino-US Trade Balance,” states, “Statistics and analyses prove it true that Sino-US trade has been in favour of China in recent years, but it is obvious that the size of the US deficit has been largely exaggerated by the US side.”<sup>16</sup> In 2007, China’s Foreign Ministry spokeswoman, Jiang Yu, said, “imbalances in China-U.S. trade are an objective fact, but this is also related to the two sides’ different statistical methods.”<sup>17</sup>

Also, when considering means or actions designed to reduce the U.S. trade deficit with China, it is useful to know which goods are the main sources of discrepancies between Chinese and U.S. trade figures, and how important they are in the overall trade flow between the two nations, so that “trade remedies” may be better targeted at the perceived problem. According to this report, the main problems appear to be in the trade figures for electrical machinery, machinery, and toys and sporting goods.

For those causes of the differences resulting from data compilation—such as misidentification of value or country of origin of imports—Congress may choose through oversight or other means to encourage the responsible U.S. agency to examine and adjust its procedures for compiling trade data. In addition, Congress may decide to press or otherwise encourage China’s customs services to conduct a similar review of its trade compilation procedures. In other cases, more detailed analysis of the trade data may be helpful in persuading China to amend or alter its laws, regulations, and policies pertaining to the import or export of goods to the United States.

## Selected Bibliography on the Differences Between U.S. and Chinese Bilateral Trade Figures

“Accounting for Discrepancies in Bilateral Trade: The Case of China, Hong Kong, and the United States,” by Michael J. Ferrantino and Zhi Wang, *China Economic Review*, vol. 19 (2008), pp. 502-520.

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<sup>15</sup> The next eight largest bilateral trade deficits in 2016, in order, were Japan—\$68.9 billion; Germany—\$64.9 billion; Mexico—\$63.2 billion; Ireland—\$35.9 billion; Vietnam—\$32.0 billion; Italy—\$28.4 billion; South Korea—\$27.7 billion; and Malaysia—\$24.8 billion.

<sup>16</sup> Information Office of the State Council of the People's Republic of China, *On Sino-US Trade Balance*, March 1997, <http://www.chinaembassy.lt/eng/zt/zfbps/t125247.htm>.

<sup>17</sup> *Washington Trade Daily*, February 16, 2007.

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