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***Patterns in U.S.-China Trade Since China's  
Accession to the World Trade Organization***

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**Cover Photos:**

Top: PRC State Councilor and CCP Politburo Member Liu Yandong visits a Boeing assembly line in Seattle, Washington, April 19, 2009. *Source:* "Chinese State Councilor Encourages U.S. Companies to Co-op with China," website of the Embassy of the People's Republic of China in the United States, posting dated April 21, 2009. <http://www.china-embassy.org/eng/zmqx/t558402.htm>.

Bottom Left: Members of a trade mission from the Iowa Soybean Association pose with a newly-unloaded shipment of U.S.-produced soybeans in Huangpu, China, March 29, 2011. *Source:* "Trade Team Watches U.S. Soybeans Arrive in China," website of the Iowa Soybean Association, posting dated March 29, 2011. <http://www.iasoybeans.com/chinablog2011>.

Bottom Right: A Chinese customs inspector stands watch over a shipment container of scrap wire being unloaded in Tianjin. *Source:* Adam Minter, "Contaminated Exports... From Where?" *Shanghai Scrap* (blog), posting dated July 5, 2007. <http://shanghaiscrap.com/?p=117>.

## Executive Summary

Following China's accession to the World Trade Organization (WTO) in December 2001, expectations were high that U.S. exports to China would increase due to reduced tariffs and increased market access. An examination of trade data from 2000 to 2011 demonstrates the following patterns in U.S.-China trade that have taken place in the decade since China's accession to the WTO:

1. U.S. exports to China have more than quintupled in value but are dwarfed by the surge of Chinese imports into the United States, resulting in a steadily growing bilateral trade deficit;
2. A dramatic rise in the levels of non-manufactured goods (particularly agricultural products, raw materials, and mined natural resource products) exported by U.S. producers to China, to the extent that there is now a U.S. trade surplus with China in non-manufactured goods;
3. A dramatic rise in imports of Chinese-made manufactured goods into the United States, and a significant decrease in U.S. exports of manufactured goods to China as a share of total exports;
4. A steady move up the value chain for Chinese imports into the United States – most noticeably in computers and consumer electronics. However, in this latter category China often serves as an assembly and export platform for multinational corporations of components manufactured elsewhere in world, a fact that may not be clearly reflected in trade statistics.

### Key Findings (2011 vs. 2000 Trade Data)

Non-manufactured products accounted for roughly twice as large a share of U.S. exports to China in 2011 as in 2000. In 2000, the United States ran a trade deficit with China in non-manufactured goods. By 2009, this deficit had become a surplus. Points worthy of note include:

- Agricultural exports from the United States to China have increased primarily as a result of increased soybean exports. (Soybeans are primarily used in China as animal feed.) Other major exports like cotton and smaller exports like tobacco have also seen significant growth. There will likely be continued growth in U.S. agricultural exports to China, based both on U.S. productive capacity and on China's large and urbanizing population. Chinese imports of U.S. cast-offs (scrap metal, waste paper, and the like) surged by 916 percent over the 2000-2008 period.<sup>1</sup> China was the largest foreign market for U.S. exports of iron and steel waste and scrap in 2011, with a nearly 28 percent increase from the previous year. From 2005 to 2011, U.S. exports of iron and steel waste and scrap to China increased from \$1.6 billion to \$2.6 billion. The waste trade is highly reliant upon commodity prices and has been driven by China's rapid development.<sup>2</sup>
- According to the U.S. International Trade Commission's 2011 report, *Shifts in U.S. Merchandise Trade*, China was the single largest source of U.S. imports by value in 2010. The largest increases in

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<sup>1</sup> United States International Trade Commission, "Shifts in U.S. Merchandise Trade 2010," Publication No. 4245, August 2011, p. 3-5.

<sup>2</sup> United States International Trade Commission, "Shifts in U.S. Merchandise Trade 2009," Publication No. 4179, August 2010, p. 3-5.

U.S. exports to China were agricultural products, motor vehicles and semiconductor manufacturing equipment.<sup>3</sup>

- Exports of oil, gas, minerals and ores from the United States to China also grew substantially over this period: from around \$105 million U.S. dollars (USD) in 2000 to \$2.1 billion USD in 2010. Exports in this category more than doubled in value from 2009 to 2010 alone. This increase can be primarily attributed to exports of metal ores, and coal and petroleum gases, and has once again likely been driven by China's rapid development.

Concurrently, there was a growing U.S. trade deficit with China in regards to manufactured goods from 2000 to 2011. The key categories of U.S.-made manufactured goods exported to China over this period remained computers and electronics, transportation equipment, chemicals and machinery. Points worthy of note include:

- The largest source of the expanded deficit was increased imports of computers and electronic products from China. While U.S. exports of computer and electronic products to China saw a shift from fully manufactured products to components (such as semi-conductors), there was a concurrent increase in imports of fully manufactured electronics and computers from China.
- The relative share of chemicals exports from 2000 to 2011 remained stable, but an increased proportion by 2011 was resin, rubber and basic chemicals. These exports may be used for infrastructure, packaging, and industrial purposes. There was a significant decline in pesticides, fertilizers and agricultural chemicals. Pharmaceuticals, one of the largest categories of U.S. chemical exports to the world as a whole, make up only a small percentage of U.S. chemical exports to China.
- The relative share of transportation equipment exports also remained relatively stable from 2000 to 2011. The United States continued to export a high amount of aviation equipment, but also exported more cars (especially in the last several years). Both the airplane and car markets may be continued growth sectors.
- While the relative share of U.S. machinery exports to China dropped slightly from 2000 to 2011, machinery exports jumped from around \$6.5 billion in 2009 to \$10.7 billion in 2011.

Although China still provided high levels of low-value added products like toys and shoes to the United States, computers and electronic products came to make up a larger share of U.S. imports from China in the period from 2000 to 2011.

- Exports other than computers and electronic products from China to the United States still accounted for roughly \$1.9 trillion in cumulative export value from 2000-2011, while computers and electronic products, on the other hand, accounted for over \$950 billion.
- Domestic trends in China, like inflation, higher wages and an aging population, may decrease China's long-term competitiveness in exporting low-value added products, like toys and shoes. Therefore, higher tech products should come to make up an increasing share of Chinese exports in the future.

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<sup>3</sup> United States International Trade Commission, "Shifts in U.S. Merchandise Trade 2010," Publication No. 4245, August 2011, p. 8-9.

- Most of the computers and electronic products exported from China to the United States are still relatively low-tech items, such as notebook computers, telephones, televisions and video games.
- Although trade statistics credit the entire manufacturing value of these computers and electronic products to China, in many cases the value added in China may be little more than assembly. The perceived limited value added by China to these higher tech exports may explain one Chinese motivation for policies like “indigenous innovation” – a desire to essentially transform the meaning of the ever-present label “Made in China” into “Made in China by Chinese Firms”.

# **U.S.-China Trade Patterns since China's Accession to the WTO**

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## Introduction – WTO Expectations

When China became the 143rd member of the World Trade Organization (WTO) on December 11, 2001, it “also committed to take concrete steps to remove trade barriers and open its markets to foreign companies and their exports from the first day of accession in virtually every product sector and for a wide range of services.”<sup>4</sup> Perhaps of greatest significance for U.S. exports, under the WTO accession agreement China agreed to reduce the average tariff for industrial goods and agriculture products to 8.9 percent and 15 percent, respectively (with most cuts made by 2004 and all cuts completed by 2010).<sup>5</sup> Moreover, there were specific restrictions on key agricultural products that China lifted when it entered the WTO,<sup>6</sup> and they agreed to limit subsidies for agricultural production and eliminate subsidies on agricultural exports.

There were expectations that WTO entry would benefit U.S. exports to China because it would open the Chinese market to foreign firms, expand trading rights, and lead to both immediate and delayed tariff reductions. In a press conference on March 29, 2000, President Clinton summed up this optimistic viewpoint:

*The United States doesn't lower any tariffs. We don't change any trade laws. We do nothing. They have to lower tariffs. They open up telecommunications for investment. They allow us to sell cars made in America in China at much lower tariffs. They allow us to put our own distributorships over there. They allow us to put our own parts over there. We don't have to transfer technology or do joint manufacturing in China anymore. This is a hundred-to-nothing deal for America when it comes to the economic consequences.*<sup>7</sup>

President Clinton also predicted that “this agreement will create jobs for America, it will create jobs for labor union members,”<sup>8</sup> and many others agreed. Perhaps embodying the spirit of the moment, Doug Bandow of the Cato Institute proclaimed that “[t]he silliest argument against [granting China market access in the United States] is that Chinese imports would overwhelm U.S. industry. In fact, American

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<sup>4</sup> Office of the United States Trade Representative, “Background Information on China's Accession to the World Trade Organization”, December 11 2011, <http://ustraderep.gov/>

<sup>5</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 16.

<sup>6</sup> “China lifted long-standing bans on the importation of agricultural goods such as corn, wheat, citrus products and meat (during the course of the U.S.-China bilateral negotiations as a sign of good faith). China must implement tariff-rate quotas that provide significant market access for bulk goods of special importance to American farmers such as grains, soy oil and cotton upon accession. China has agreed to eliminate import monopolies maintained by State trading enterprises on agricultural goods such as wheat, rice and corn and to permit non-State trading enterprises to import them.” (Office of the United States Trade Representative, “Background Information on China's Accession to the World Trade Organization”, December 11 2011, <http://ustraderep.gov/>)

<sup>7</sup> Washington File, *Transcript: Clinton March 29 Comments on U.S.-China Relations*, March 30, 2000, <http://usinfo.org/wf-archive/2000/000330/epf401.htm>

<sup>8</sup> Washington File, *Transcript: Clinton March 29 Comments on U.S.-China Relations*, March 30, 2000, <http://usinfo.org/wf-archive/2000/000330/epf401.htm>



workers are far more productive than their Chinese counterparts.”<sup>9</sup> As a result of this confidence, most of the debate surrounding China’s accession to the WTO had little to do with economics<sup>10</sup> and instead focused on issues like human rights, political concerns and the environment.

So what has actually happened since China entered the WTO? How have the expectations of 2001 actually played out over the past decade? And what factors have caused the U.S. trade deficit with China to more than triple between 2000 and 2011?

In order to better understand how patterns in U.S.-China trade have changed over the course of the last decade, this report will compare official U.S. trade statistics from 2000 (the last full year before China entered the WTO) and 2011.<sup>11</sup> After a brief overview of the current trade balance, this report will examine exports and imports in particular sectors in greater detail and explicate some of the trends in U.S.-China trade that the statistics reveal.

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<sup>9</sup> Doug Bandow, “Trade with China: Business Profits or Human Rights?”, Cato Institute, [http://www.cato.org/pub\\_display.php?pub\\_id=4713](http://www.cato.org/pub_display.php?pub_id=4713)

<sup>10</sup> This is not to say that there was no debate over economic issues. For example, “USCC Commissioner Pat Mulloy noted at the June 9[, 2010] hearing that one person had correctly analyzed the deal: Joseph Quinlan, an economist with Morgan Stanley. Quoted in the Wall Street Journal, Quinlan said: ‘While the debate in Washington focused mainly on the probable lift for U.S. exports to China, many U.S. multinationals have something different in mind. The deal is about investment, not exports.’” (Richard A. McCormack, “China’s Entry Into The WTO 10 Years Later Is Not What President Clinton Promised”, *Manufacturing & Technology News*, June 15, 2010.)

<sup>11</sup> Unless otherwise specified, data for this report was generated using TradeStats Express from the U.S. Department of Commerce’s Office of Trade Industry Information’s Trade Policy Information System (TPIS).

## Growth of Exports, Growth of Imports, Growth of Deficit

According to the U.S.-China Business Council (USCBC), China became the 3rd largest U.S. export market in 2007,<sup>12</sup> a ranking it continued to maintain through 2011.<sup>13</sup> U.S. exports to China increased by an average of 18.4 percent from 2000 to 2011, resulting in growth of over 468 percent for the decade.<sup>14</sup> In comparison, U.S. exports to the rest of the world increased by 55 percent.<sup>15</sup> According to the Foreign Trade Division of the U.S. Census Bureau, U.S. total exports to China increased from roughly \$16.2<sup>16</sup> billion in 2000 to \$91.9 billion in 2010.<sup>17</sup> In 2011, U.S. exports to China totaled \$103.9 billion.<sup>18</sup>

The increasing purchasing power of China's 1.3 billion citizens, coupled with China's goals of modernizing its infrastructure, upgrading its industries and improving rural living standards has led many trade analysts to argue that China could become an even more significant market for U.S. exports in the future.<sup>19</sup>

On the other hand, in absolute terms imports from China into the United States have outpaced exports from the United States to China since China entered the WTO. China has gone from being the eighth largest source of U.S. imports in 1990 to the fourth in 2000, to the second in 2004-2006, and the first by 2007.<sup>20</sup> China was the largest source of U.S. goods imports in 2011 at \$399 billion.<sup>21</sup>

As a result, according to the Foreign Trade Division of the U.S. Census Bureau, the U.S.-China trade balance has ballooned from \$83.8 billion in 2000 to \$295 billion in 2011. In sum, though U.S. exports to China have grown since 2000, the overall value of exports has been dwarfed by imports from China, resulting in a major trade imbalance.

To better understand the drivers of export growth from the U.S. to China, this report will next examine the changing composition of exports from the U.S. to China during the period from 2000 to 2011.<sup>22</sup>

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<sup>12</sup> Xinhua News, "China becomes 3rd largest export market of U.S. in 2007," March 5, 2008. [http://english.gov.cn/2008-03/05/content\\_909530.htm](http://english.gov.cn/2008-03/05/content_909530.htm)

<sup>13</sup> U.S.-China Business Council, "Top US Export Markets in 2011 (\$ billion)," 2012. [https://www.uschina.org/public/exports/2000\\_2011/2011-us-exports-top-10-markets.pdf](https://www.uschina.org/public/exports/2000_2011/2011-us-exports-top-10-markets.pdf)

<sup>14</sup> U.S.-China Business Council, "Top US Export Markets in 2011 (\$ billion)," 2012. [https://www.uschina.org/public/exports/2000\\_2011/2011-us-exports-top-10-markets.pdf](https://www.uschina.org/public/exports/2000_2011/2011-us-exports-top-10-markets.pdf)

<sup>15</sup> U.S.-China Business Council, "US Exports to China by State: 2000-2010", 2011, <http://www.uschina.org/>

<sup>16</sup> Unless otherwise specified, all figures in this report are in nominal U.S. dollars.

<sup>17</sup> <http://tse.export.gov>. Moreover, these increased exports have not originated from a single source or industry. "Twenty-four states exported more than \$1 billion to China in 2010." (U.S.-China Business Council, "US Exports to China by State: 2000-2010", 2011, <http://www.uschina.org/>).

<sup>18</sup> <http://www.census.gov/foreign-trade/balance/c5700.html#2011>

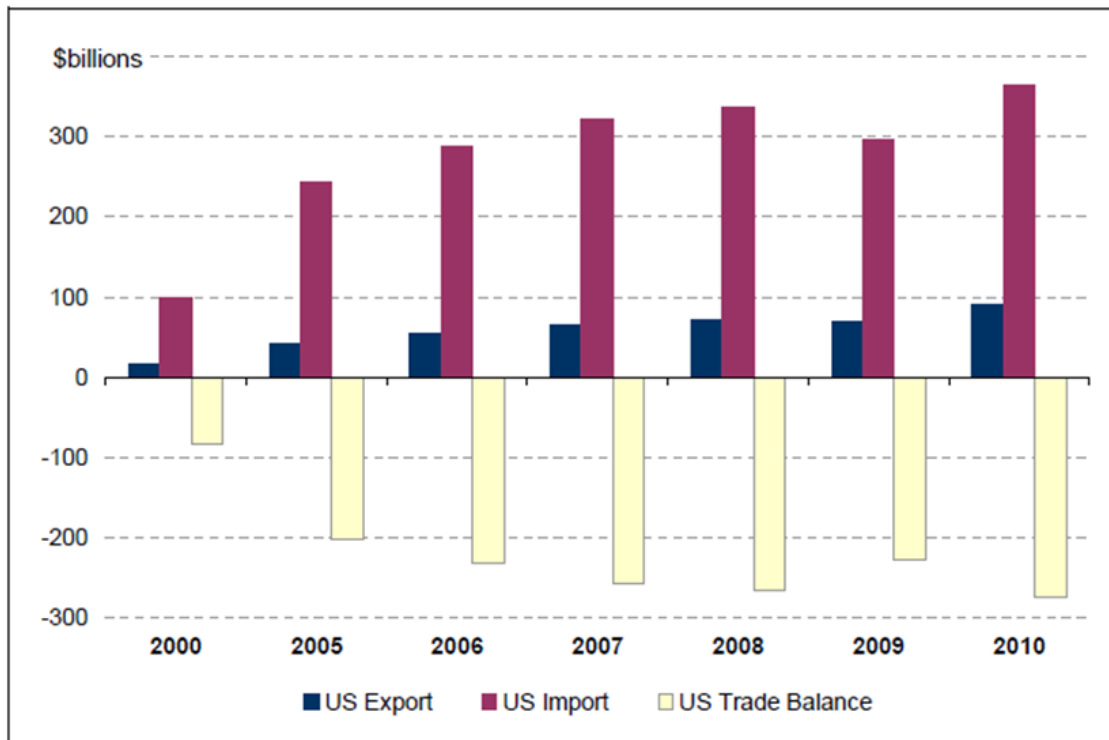
<sup>19</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 5.

<sup>20</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 6.

<sup>21</sup> Office of the United States Trade Representative, "US-China Trade Facts," 2012. <http://www.ustr.gov/countries-regions/china>

<sup>22</sup> This report looks at exports and imports in terms of dollar values. This must be made with two caveats. First, these dollar values are not adjusted for inflation or differences in the exchange rate between the U.S. and China. Second, the same value worth of soy beans or waste likely takes up more volume than that value worth of cars. For

**Figure 1: U.S.-China Trade Balance**<sup>23</sup>



Source: U. S. International Trade Commission DataWeb.

### **Transshipping and Relocated Production**

Although this report relies upon officially reported U.S.-China trade statistics, an unknown portion of U.S. exports to and imports from China are transshipped via an intermediary location. The most important transshipping point for China is Hong Kong, due to its lower taxes and freer trade regulations as compared to the rest of China. While it is difficult to distinguish between U.S.-Hong Kong trade and U.S.-China trade transshipped through Hong Kong, the impact of such transshipping upon the U.S.-China trade balance cannot be discounted. A Congressional Research Service report noted that there were two main types of discrepancies caused by differing U.S.-China transshipment calculations:

- The exporting country lists the intermediary as the destination, whereas the importing country lists the exporting country as the origin.
- Shipment via the intermediary country changes the value of the goods when they are en route between origin and destination countries. This issue of value differences reportedly accounts for almost half of the discrepancy between U.S. and Chinese trade statistics.<sup>24</sup>

both these reasons, this report does not claim to reflect the changing composition of imports or exports in terms of volume traded, but rather only in terms of nominal dollar value.

<sup>23</sup> Wayne Morrison, "China-U.S. Trade Issues," Congressional Research Service, Washington, DC, September 30, 2011, p. 2.

<sup>24</sup> Michael F. Martin, "What's the Difference? – Comparing U.S. and Chinese Trade Data," *Congressional Research Service*, April 21, 2010.

Transshipment thus leads to different U.S. and Chinese trade balance calculations, with the United States understating U.S. exports to China, and China understating Chinese exports to the United States; and the United States overestimating the overall trade imbalance, while China underestimates it.

According to one team of economic analysts, “adjusting for re-exports via Hong Kong... reduced the difference between the U.S. and Chinese trade deficit for 2005 from \$87.4 billion to \$26.5 billion.”<sup>25</sup> In 2010, the United States reported a trade deficit of \$273 billion with China; U.S. exports to China grew by 32 percent, imports from China grew by 23 percent, and the overall U.S.-China deficit grew by 20 percent.<sup>26</sup>

Transshipping can also be used as a measure to evade and undermine anti-dumping duties. The USCC raised this issue in its 2004 Annual Report in analysis of the effect of the impact of China’s entry into the WTO upon the U.S. textile and apparel manufacturing industry. As the Report noted at that time, “...new trade agreements, such as the Central American Free Trade Agreement (CAFTA), provide an opportunity for the transshipment of Chinese textiles through third country ports, which would undermine the China specific textile safeguards imposed by the U.S. against a range of Chinese goods in December.”<sup>27</sup>

The USCC raised this issue again in its 2008 Annual Report, in its analysis of the impact of Chinese imports upon import-sensitive product lines in the Gulf of Mexico regions of the United States after China’s admission to the WTO,

*Antidumping penalties imposed by the United States on Chinese shrimp and crawfish exports sold at below market value accomplished little of their intended effect. This appears to be due in part to transshipment by China through ports of other Asian nations in order to avoid the penalty tariffs and in part to the failure to collect the penalty tariffs.”<sup>28</sup>*

*...a penalty tariff was imposed on shrimp from China and five other countries beginning in 2005... At first, the penalty tariffs seemed to be working to the benefit of U.S. shrimpers. Frozen shrimp imports from China dropped from about 120 million pounds in 2004 to 25 million pounds in 2005... [However,] Louisiana dockside prices of wild-caught shrimp... stayed relatively flat... Imported shrimp’s major effect on the U.S. market was to drive the price lower and then to help keep it there, despite the tariff. The U.S. industry... has blamed this, in part, on the Chinese practice of transshipping shrimp through ports in other countries to escape the penalty tariff. For example, shrimp exports suddenly began arriving in the United States from Papua*

<sup>25</sup> K.C. Fung, Lawrence J. Lau and Yangyan Xiong, “Adjusted Estimates of United States-China Bilateral Trade Balances — An Update” *Stanford Center for International Development*, Working Paper No. 278, June 2006.

<sup>26</sup> Dick K. Nanto and J. Michael Donnelly, “U.S. International Trade: Trends and Forecasts”, *Congressional Research Service*, September 6, 2011.

<sup>27</sup> U.S.-China Economic and Security Review Commission, *2004 Report to Congress*, June 2004, p. 254.

<sup>28</sup> U.S.-China Economic and Security Review Commission, *2008 Report to Congress*, November 2008, p. 6.

*New Guinea, a country that had not previously exported any shrimp. Shrimp exports from Indonesia and Malaysia also showed large increases. Cambodia, which had exported no shrimp to the United States and had imported none from China, suddenly imported nearly 2 million pounds from China and exported more than 3.5 million pounds to the United States in the weeks after the preliminary Department of Commerce antidumping ruling against China in July 2004.”<sup>29</sup>*

Another means of evading levies is to relocate production to a third country. While such production no longer is reflected in Chinese export figures to America, they nevertheless reflect the activities of Chinese companies. A key example of this is furniture. In January 2005, the Commerce Department imposed an import tariff on Chinese-made beds, nightstands and related goods. In response, Chinese furniture makers (mostly Taiwanese businessmen who had set up factories in Dongguan, China) opened factories in Vietnam. Vietnam is now the biggest source of wooden bedroom furniture sold in America, and these furniture makers are now considering expanding production to Indonesia. As a result,

*imports now account for about 70 percent of the U.S. market for beds and similar items, up from 58 percent before Washington intervened to try to protect domestic manufacturers from Chinese ‘dumping’ or the export of goods at unfairly low prices... The number of Americans now employed making bedroom furniture is less than half what it was when the tariff began.<sup>30</sup>*

### **Basic Composition of U.S. Exports to China**

All of the top six U.S. export categories to China in 2011 were the same categories as in 2000. Exports in each of these key categories have grown in absolute terms from 2000 to 2011 (see Figures 2, 3 and 4).

The top export categories<sup>31</sup> from the U.S. to China in 2000 were:

- |                                     |                                 |
|-------------------------------------|---------------------------------|
| 1. Computer and Electronic Products | 2. Chemicals                    |
| 3. Transportation Equipment         | 4. Machinery, except electrical |
| 5. Agricultural Products            | 6. Waste and Scrap              |

In comparison, the top export categories<sup>32</sup> from the U.S. to China in 2011 were:

- |                          |                                     |
|--------------------------|-------------------------------------|
| 1. Agricultural Products | 2. Computer and Electronic Products |
| 3. Chemicals             | 4. Transportation Equipment         |
| 5. Waste and Scrap       | 6. Machinery, except electrical     |

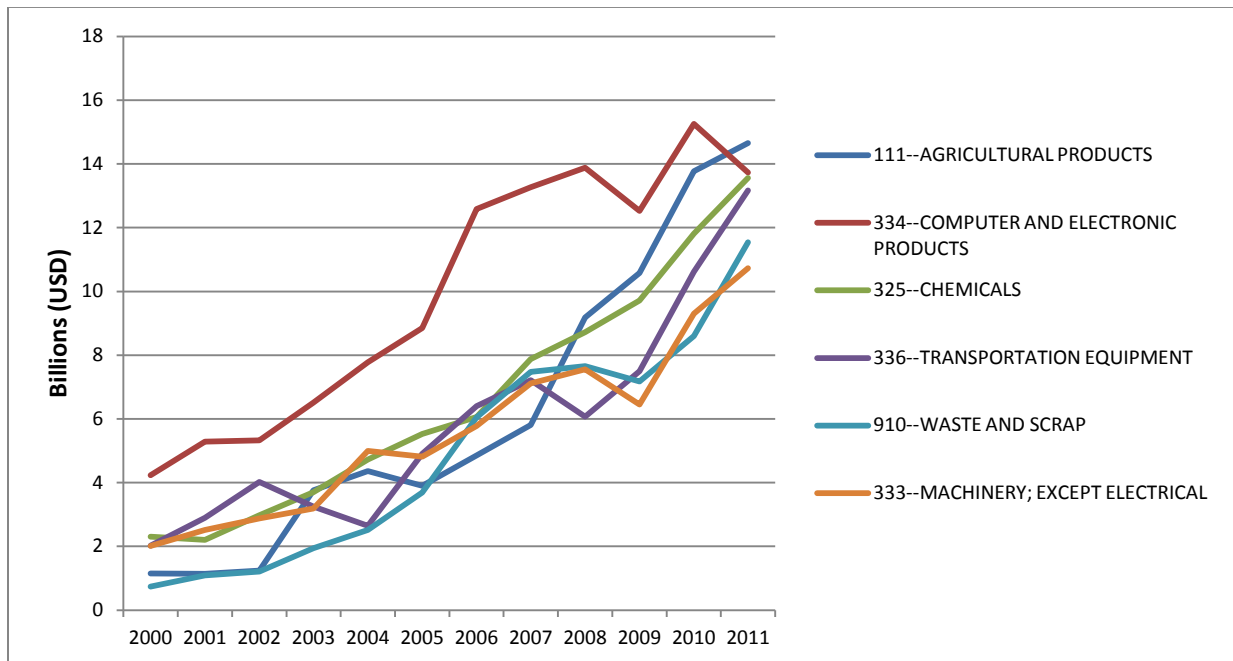
### **Figure 2: Exports from U.S to China (2000 - 2011, NAICS 3-digit)**

<sup>29</sup> U.S.-China Economic and Security Review Commission, *2008 Report to Congress*, November 2008, pp. 85-86.

<sup>30</sup> Andrew Higgins, “From China, a run around U.S. tariffs”, *Washington Post*, May 23, 2011.

<sup>31</sup> NAICS, 3-digit. “The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.” (From U.S. Census Bureau, <http://www.census.gov/>)

<sup>32</sup> NAICS, 3-digit.



The most striking change in the period from 2000 to 2011 is the growing relative importance of the two categories of non-manufactured goods (agricultural products and waste/scrap) among the top six export categories. Agricultural products have gone from being the 5th largest U.S. export to China in 2000 to the largest export category 8 in 2011. Since 2006, waste and scrap has been a top-five export every year except 2010, when it was the 6th largest U.S. export to China.

This illustrates a larger trend within this period regarding U.S. exports to China: Approximately 84.5 percent of U.S. exports to China in 2000 were classified as manufactured goods, versus only 68.7 percent in 2011. Concurrently, U.S. exports of non-manufactured goods exploded from \$2.5 billion (approximately 15 percent of exports) in 2000 to \$32.6 billion (approximately 31 percent of exports) in 2011. This means that the relative share of non-manufactured goods exported from the U.S. to China roughly doubled from 2000 to 2011, and the absolute value increased 13-fold.<sup>33</sup> To better understand these trends, this report next turns to examining these top export categories, divided into non-manufactured versus manufactured goods.

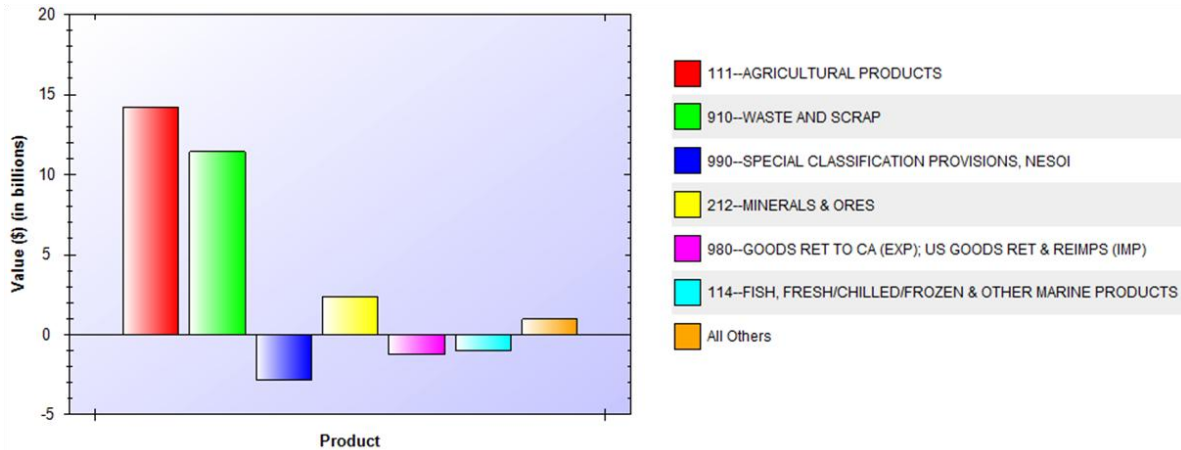
### **Non-Manufactured Goods**

One obvious change in U.S.-China trade since China entered the WTO is that the United States ran a trade surplus with China of \$23.8 billion in non-manufactured goods in 2011 versus a deficit of \$283

<sup>33</sup> NAICS. Generally, non-manufactured goods are goods which are in an unprocessed state (e.g. iron ore), whereas manufactured goods have been processed (e.g. televisions). While scrap and waste are derived from previously manufactured goods, they can be understood as non-manufactured goods in evaluating exports.

million in 2000.<sup>34</sup> This surplus in 2011 was almost entirely derived from two sectors: agriculture, and waste and scrap. (See Figure 5)

**Figure 3: 2011 Balances with China for NAICS All Non-Manufactured Goods**



Agriculture and waste materials are not the only two categories of non-manufactured goods in which exports increased between 2000 and 2011. Exports of oil, gas, minerals and ores from the United States to China also grew substantially over this period: from \$105 million in 2000 to \$2.6 billion in 2011. In particular, metal ore exports grew from \$32.9 million in 2000 to \$1.5 billion in 2011, and coal and petroleum gas exports went from a mere \$540,985 in 2000 to over \$835 million in 2011.<sup>35</sup>

### **Agricultural Products**

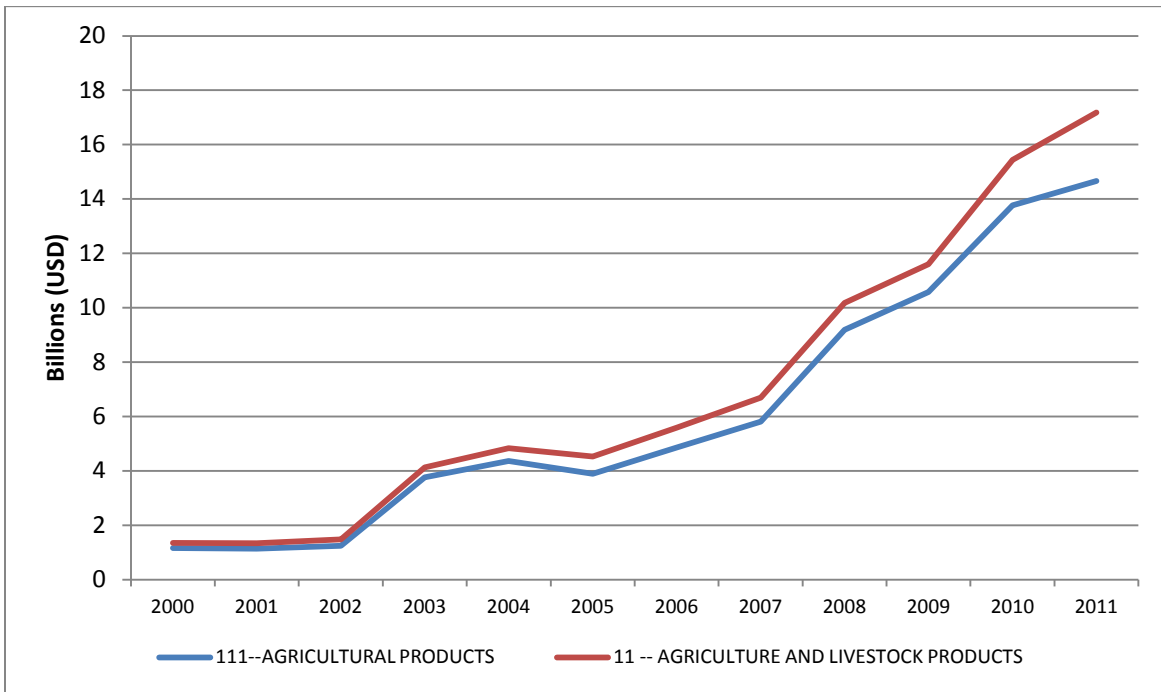
Plant-based agricultural products, as distinct from livestock products, made up the lion’s share of U.S. agricultural exports to China between 2000 and 2011. (See Figure 4: About 85.3 percent of agriculture and livestock product exports in 2011 were plant-based agricultural products.) Agricultural products roughly doubled as a share of all U.S. exports to China (from 7.1 percent in 2000 to 14.1 percent in 2011– see Figures 2 and 3). China became the top U.S. agricultural products export market in 2010.<sup>36</sup> After failing to achieve sustained growth in the 1990s, exports of American agricultural products to China have increased especially sharply since 2002 (see Figure 4). The value of agricultural exports from the United States to China went from \$1.2 billion in 2000 to \$14.7 billion in 2011.

**Figure 4: Agriculture and Livestock Products Exports, U.S. to China (2000-2011, NAICS 3-digit)**

<sup>34</sup> NAICS, 2-digit

<sup>35</sup> NAICS 2122 and 2121.

<sup>36</sup> “Exports of U.S. agriculture products hit an all-time high in 2010. U.S. Agriculture Secretary Tom Vilsack says it’s because U.S. producers are the best on Earth, resulting in high demand for U.S. products, especially on the far side of the Pacific. ‘China became our number one market, surpassing Canada,’ said Vilsack, in an interview provided by the USDA. ‘Ag exports to China were over \$17.5 billion in the calendar year; that’s up from \$13.1 billion in calendar year 2009, a 34 percent increase.’” (Tom Steever, “China is number one U.S. ag customer”, *Brownfield: Ag News for America*, February 12, 2011, <http://brownfieldagnews.com/>)

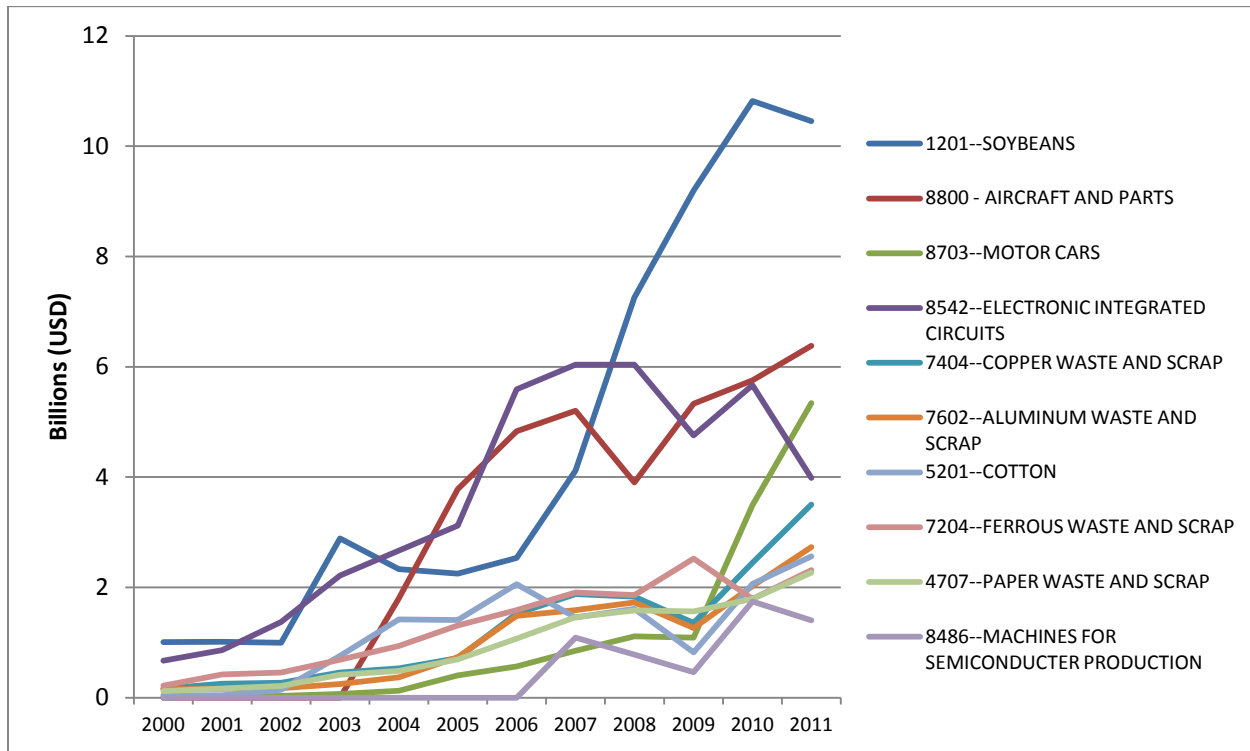


The single most significant factor observable in U.S. agricultural exports to China is the dramatic growth in soybean sales, which rose from roughly \$1 billion in 2000 to \$10.5 billion in 2011. Soybeans not only stand out amongst agricultural exports to China, but have achieved an increasingly dominant position among total U.S. exports to China since 2000. Since 2008 soybeans have been the single largest export from the United States to China (see Figure 5), with U.S. companies shipping \$10.5 billion worth of soybeans to China in the year 2011.<sup>37</sup>

<sup>37</sup> Ben Baden, "From Cars to Soybeans, US Exports to China Are Booming," *China Business Review*, July-September 2012, <https://www.chinabusinessreview.com/public/1207/baden.html>



**Figure 5: Top U.S. Exports to China (2000 – 2011, HS 4-Digit)**<sup>38</sup>



In part because of increased United States - China soybean trade, China is now the world’s largest soybean importer and the United States is the world’s top exporter.<sup>39</sup> This trend of heavy Chinese purchases of soybeans from other countries is likely to increase in the future rather than reverse itself, since according to Xiaoping Zhang, acting director in China for the U.S. Soybean Export Council, “most of the land in China that can be farmed profitably is under cultivation and that available land is shrinking in the face of development.”<sup>40</sup>

China currently buys approximately a third of America’s annual soybean crop<sup>41</sup> for use in animal feed and other important food products like cooking oil.<sup>42</sup> The political sensitivity of inflated food prices in China and the high percentage of soybean demand satisfied through trade with the U.S. has greatly increased China’s vulnerability to shocks in U.S. supply. The extent of interdependence between the U.S. and Chinese markets has become especially evident as a result of serious drought conditions in 2012 throughout the American Midwest and Great Plains regions. In August 2012, the U.S. Department of

<sup>38</sup> “The Harmonized System or simply HS Code is the most widely used system for classifying traded goods. Every product traded is classified into a 10-digit code. The first two digits of the products code corresponds to one of the 98 HS “chapters,” that classify all goods in general categories.” (Michael Martin, “What’s the Difference? – Comparing U.S. and Chinese Trade Data”, Congressional Research Service, April 10, 2007, p.2.) HS category 8802 is used from 2000 to 2003 and HS category 8800 is used from 2004 to reflect exports of aircraft and parts.

<sup>39</sup> *The Economist*, “Business This Week”, January 15 2011, p.7.

<sup>40</sup> Howard Schneider, “China food choices reshaping world markets”, *The Washington Post*, May 23, 2011.

<sup>41</sup> *The Economist*, “Business This Week,” January 15, 2011.

<sup>42</sup> Over two-thirds of cooking oil consumed in China comes from soybeans

Agriculture (USDA) reported that U.S. soybean growing conditions were the worst since 1988, and reduced its annual crop estimate to 4.2 billion bushels (16 percent below 2011's record-setting crop levels).<sup>43</sup> The drought further depressed already eroded global inventories and prompted market prices to skyrocket to over \$17 a bushel in the final weeks of August.<sup>44</sup>

Despite the efforts of U.S. soybean farm leaders to reassure Chinese customers of their stability, Chinese buyers responded by cancelling 163,000 tons of soybean purchases in summer 2012, reducing net sales to their lowest levels in over a year.<sup>45</sup> In an effort to diversify its sources of supply, China has also emerged as a major customer for soybeans grown in South American nations, particularly Brazil and Argentina. As of November 2012, there were signs that Brazil could overtake the position of the United States as China's largest supplier of soybeans — due both to record harvests in Brazil, as well as to the spike in prices for U.S. soybeans caused by drought conditions in many agricultural states.<sup>46</sup>

### **Minnesota's Soybean Sales to China**

Making a pilgrimage to America's heartland is fast becoming a prerequisite for Chinese leaders visiting the United States. As reported by the Minnesota Soybean Research & Promotion Council,

*Coinciding with President Hu Jintao's January 2011 meetings with President Obama in Washington, D.C., a delegation consisting of representatives from China's ten largest soybean crushers visited Minnesota on January 19<sup>th</sup> to discuss the state's largest agricultural export: soybeans. The Governor thanked the Chinese trade team for being the world's largest customer for U.S. soybeans. Following the Minnesota visit, the delegation went to Chicago where they signed commitments to purchase more than 423 million bushels of U.S. soybeans valued at \$6.68 billion.<sup>47</sup>*

According to some sources, China's difficulty feeding itself will present an increasing number of opportunities for American farmers.<sup>48</sup> Recent soybean contracts "also underscore the growing

<sup>43</sup> Whitney McFerron and Phoebe Sedgman, "Soybeans Top \$17 for First Time on U.S. Exports Demand," Bloomberg Businessweek, August 21, 2012. <http://www.businessweek.com/news/2012-08-21/soybeans-top-17-for-first-time-as-demand-jumps-for-u-dot-s-dot-exports>

<sup>44</sup> Whitney McFerron and Phoebe Sedgman, "Soybeans Top \$17 for First Time on U.S. Exports Demand," Bloomberg Businessweek, August 21, 2012. <http://www.businessweek.com/news/2012-08-21/soybeans-top-17-for-first-time-as-demand-jumps-for-u-dot-s-dot-exports>

<sup>45</sup> Clyde Russell, "China soybean import demand to wane, softening prices," Reuters, August 13, 2012. [http://articles.chicagotribune.com/2012-08-13/news/sns-rt-us-column-russell-soy-chinabre87c069-20120812\\_1\\_soybean-imports-tonnes](http://articles.chicagotribune.com/2012-08-13/news/sns-rt-us-column-russell-soy-chinabre87c069-20120812_1_soybean-imports-tonnes)

<sup>46</sup> Rodrigo Orihuela and Mario Sergio Lima, "Brazil Beating U.S. in Soybean Exports is Boon for All: Freight," Bloomberg News, Nov. 27, 2012. <http://www.bloomberg.com/news/2012-11-28/brazil-beating-u-s-in-soybean-exports-is-boon-for-all-freight.html>.

<sup>47</sup> Excerpted from Minnesota Soybean Research & Promotion Council, "Minnesota Benefits from \$6.6 Billion Purchase of U.S. Soybeans by China", <http://www.mnsoybean.org/>

importance of US grain exports to the world's largest country, which is expected to surpass Mexico this year as the second-largest buyer of US farm products. China needs to import increasing volumes of protein-rich food to feed its swelling urban ranks."<sup>49</sup> As was said by one farmer, "China is extremely important to Minnesota agriculture, especially soybean farmers. Look at a Minnesota soybean field and realize that every fourth row is purchased by China."<sup>50</sup>

In February 2012, then-PRC Vice President Xi Jinping visited Iowa during his tour of the United States. The stopover was part homecoming: Xi visited Muscatine, Iowa in 1985 as part of an agricultural research delegation, and he met with the family that hosted him on that first trip. However, Xi also sought to highlight one sector of U.S.-China bilateral trade that unambiguously favors the United States. Soybean exports from Iowa to China increased 13-fold from 2000 to 2010, according to the Iowa Department of Agriculture.<sup>51</sup> Perhaps most important of all to Iowa's agricultural sector, the Chinese delegation signed agreements to purchase 8.62 million metric tons of soybeans (worth \$4.3 billion) from farmers in the state.<sup>52</sup>

Although soybeans have been the mainstay of U.S. agricultural exports to China, the past decade has also seen increases in exports of other agricultural and livestock products, to include cotton, fish & seafood, and meat (see Figure 6).

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<sup>48</sup> "China will have more difficulty feeding itself in the coming years as expanding demand, spurred by increased urbanization, strains resources, Vice Minister of Agriculture Chen Xiaohua said. As more people move into cities and towns, the supply of farm products is limited by declining productivity of rural labor, a worsening natural environment and more extreme weather, Chen said in a transcript of a speech released by the department on Jan. 26." (William Bi, "China Faces More Difficulty Meeting Food Demand, Official Says", January 31, 2011, *Bloomberg News*.)

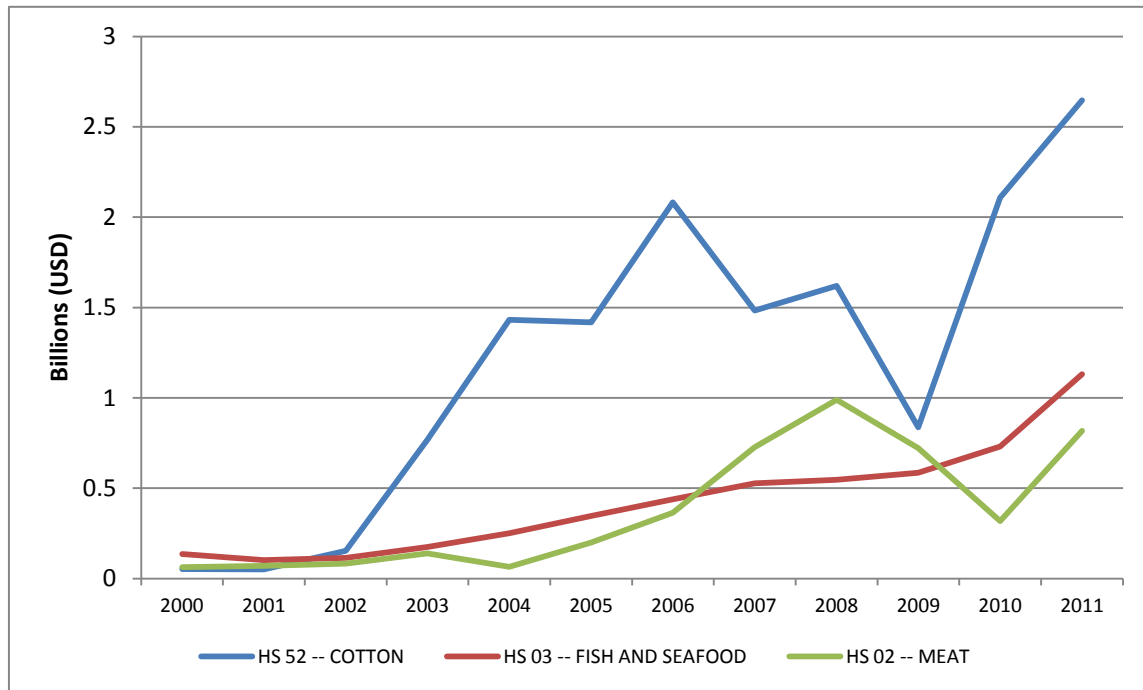
<sup>49</sup> "China wraps up record US soybean deal", *Reuters*, January 21, 2011.

<sup>50</sup> Excerpted from Minnesota Soybean Research & Promotion Council, "Minnesota Benefits from \$6.6 Billion Purchase of U.S. Soybeans by China", <http://www.mnsoybean.org/>

<sup>51</sup> Jeff Wilson, "China to Buy \$4.3 Billion of Soybeans in Deals With U.S. Exporters in Iowa," *Bloomberg News*. February 15, 2012. <http://www.bloomberg.com/news/2012-02-15/china-to-buy-4-3-billion-of-soybeans-in-deals-with-u-s-exporters-in-iowa.html>

<sup>52</sup> Jeff Wilson, "China to buy \$4.3 billion of soybeans in deals with U.S. exporters in Iowa," *Bloomberg*, February 15, 2012.

**Figure 6: Exports of Selected Agricultural Products (Cotton, Seafood, and Meat) from the United States to China (2000 – 2011)**



### **“Back Door” Beef Exports to China**

The uneven increase in U.S. sales of meat to China during this period is striking because China has still not lifted its ban on U.S. beef.<sup>53</sup> However, some analysts claim that lifting this official ban on beef would not provide significant new Chinese market access for American beef exporters, due to existent “back door” exports of U.S. beef to China as transhipped via Hong Kong. The commodity research and consulting firm Allendale Inc.<sup>54</sup> has published a chart showing that “the volume of U.S. beef shipped to China through the back door of Hong Kong has increased from about 50 million pounds in 2003 to

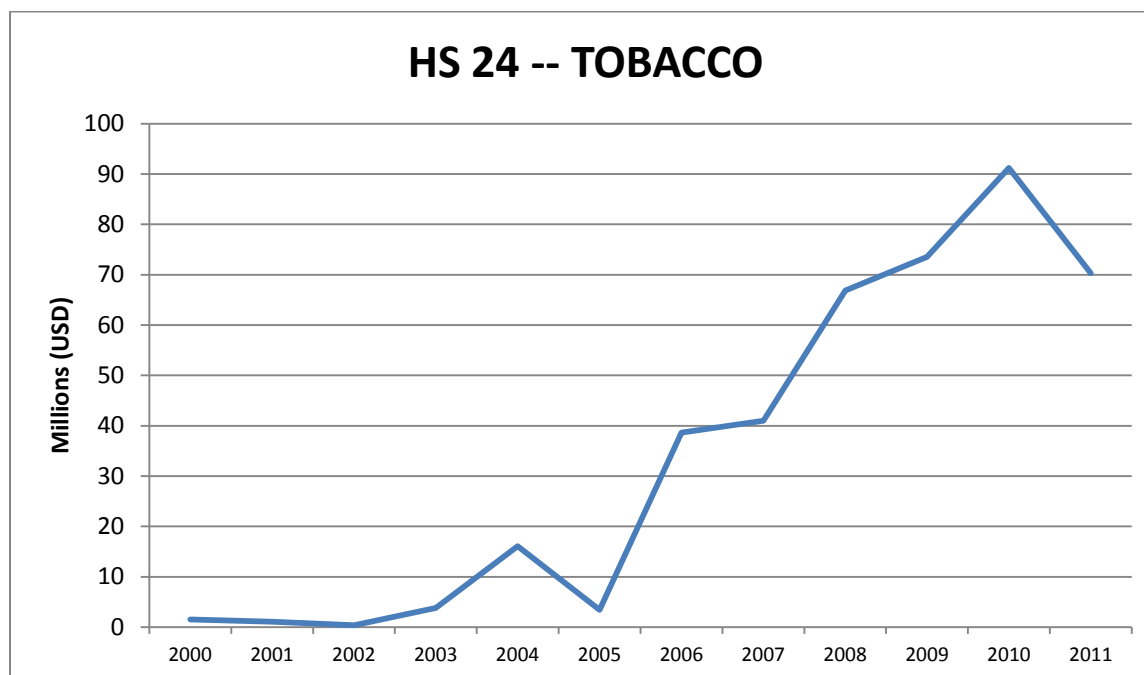
<sup>53</sup> “China banned U.S. beef in December 2003 after the first case of bovine spongiform encephalopathy, or mad-cow disease, was discovered in the U.S. Back then, U.S. beef exports to China were relatively small--about \$23 million... The potential market China represents now, though, is much larger and growing... Gregg Doud, chief economist for the U.S.-based National Cattlemen's Beef Association, said the Chinese beef market could be worth \$200 million a year now to U.S. exporters if the ban was lifted.” (*Meat Trade Daily News*, “China - Green light expected for US beef”, June 27, 2010, <http://www.meatradenewsdaily.co.uk/>) [Multiple factors now keep U.S. beef out of China](#). For example, “one beef-related issue limiting U.S. sales is the zero tolerance policies of China and Taiwan for beef that contains ractopamine, a feed additive that aims to raise leaner beef.” (*Inside US-China Trade*, “Kirk Says Administration Seeks ‘Immediate Progress’ on Trade At S&ED”, April 19, 2011.)

<sup>54</sup> According to their website, McHenry, Illinois-based Allendale, Inc. is “one of the largest commodity research advisory firms in the United States and one of the few remaining brokerage firms that develops its own economic research.” (<http://www.allendale-inc.com/about/howweare.aspx>)

almost 125 million pounds in 2010. As stated by a company official, 'The message to us is (don't) expect beef exports to China to explode if a deal goes through'."<sup>55</sup>

Other particular U.S. agricultural sectors have also seen significant growth in exports to China since 2000. A key example of a U.S. agricultural product that may have directly benefited from China's accession to the WTO is tobacco.<sup>56</sup> According to an article in 2007 published by *Tobacco International*,<sup>57</sup> "the boost for imports of leaf tobacco began when the import duty dropped to 10 percent according to WTO guidelines in 2004, compared with the previous duty of 40 percent."<sup>58</sup>

***Figure 7: U.S. Tobacco Exports to China (2000-2011, HS 2-digit)***



U.S. tobacco exports to China have skyrocketed since 2005 (see Figure 7). Exports have increased by over 60 times, from \$2.5 million in 2000 to \$117 million in 2011. Notably, this increase has consisted almost entirely of unmanufactured tobacco,<sup>59</sup> as opposed to finished tobacco products like cigarettes. China is the world's biggest cigarette market by volume, but maintains high tariffs for imported manufactured cigarettes and other finished tobacco products.<sup>60</sup>

<sup>55</sup> "Silence on beef imports during China President's visit in Washington", *Feedstuffs*, January 20, 2011, <http://www.feedstuffs.com/>

<sup>56</sup> HS, category 24.

<sup>57</sup> "Since 1886, Tobacco International has been the tobacco industry's leading trade journal." <http://www.tobaccointernational.com/>

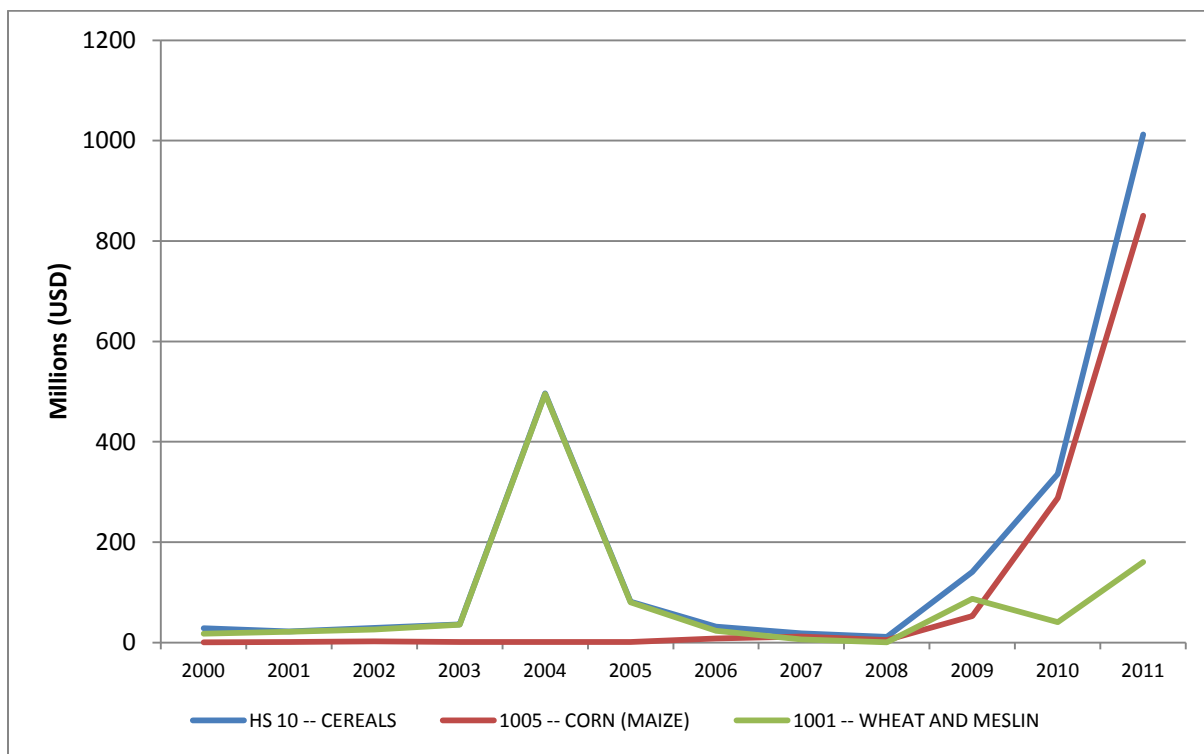
<sup>58</sup> John Parker, "China's Leaf Tobacco Imports Show Upward Trend", *Tobacco International*, September 2007.

<sup>59</sup> According to The Foreign Trade Division of the U.S. Census Bureau, Unmanufactured tobacco made up over 99.9% percent of total tobacco exports in 2010 versus 34 percent in 2000. (<http://tse.export.gov>)

<sup>60</sup> Business Wire, "Research and Markets: Research Report on China's Cigarette Industry - 2010-2012", December 23, 2010, <http://www.businesswire.com/>.

Not all agricultural exports grew consistently from 2000 to 2011. Cereal exports to China had an uneven decade, with wheat and meslin exports in particular failing to sustain substantial growth (see Figure 8). This may be related to China’s national policy of encouraging autarkic self-sufficiency in human staple consumption grains. According to Keith Bradsher, Hong Kong bureau chief of *The New York Times*, “China has been essentially self-sufficient in grain for decades, for national security reasons... China’s national obsession with self-sufficiency in food includes corn, another crop that is grown and consumed entirely in China with minimal imports or exports.”<sup>61</sup> Despite Mr. Bradsher’s claim, there has recently been growth in U.S. exports of corn to China, especially between 2009 – 2011 (see Figure 8), and some analysts argue that China will increasingly import corn and wheat to keep up with internal demand.<sup>62</sup>

**Figure 8: Cereal Exports, U.S. to China (2000-2011, HS 4-Digit)**



<sup>61</sup> Keith Bradsher, “U.N. Food Agency Issues Warning on China Drought”, *The New York Times*, February 8, 2011.

<sup>62</sup> Howard Schneider, “China food choices reshaping world markets”, *The Washington Post*, May 23, 2011.

## Waste and Scrap

After China entered the WTO, the value of U.S. waste and scrap exports to China increased more than 15-fold, from \$740 million in 2000 to \$11.5 billion in 2011, and more than doubled as a share of U.S. exports to China (from 4.6 percent in 2000 to 11.1 percent in 2011– see Figures 2 and 3). This increase was mainly driven by ferrous metal, paper, copper, and aluminum waste / scrap. In 2011, waste and scrap was still the second largest non-manufactured U.S. export category to China, behind only agriculture. Waste and scrap had an especially prominent position in U.S. exports to China from 2006 to 2009. For example, of the top ten exports from the United States to China in 2009, numbers 4 through 7 were all waste products<sup>63</sup>:

4. Ferrous waste and scrap – \$2.51 billion in sales
5. Paper waste and scrap – \$1.57 billion in sales
6. Copper waste and scrap – \$1.36 billion in sales
7. Aluminum waste and scrap – \$1.26 billion in sales<sup>64</sup>

The increase in waste and scrap exports during this period was likely driven by a combination of high commodity prices, strong demand within China for raw materials used in manufacturing and construction,<sup>65</sup> and the low cost of labor in China.<sup>66</sup>

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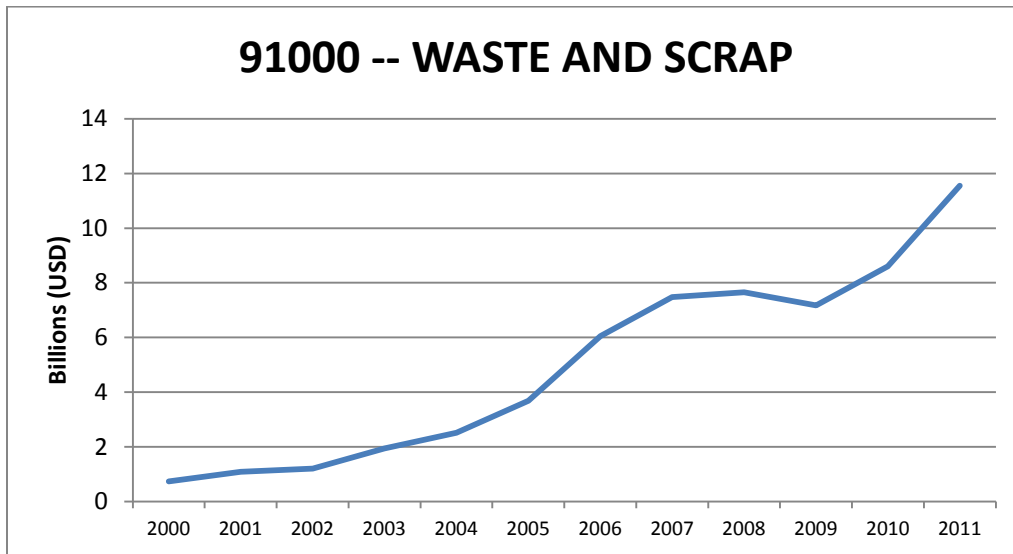
<sup>63</sup> HS 4-digit. From 2009 to 2011, the relative importance of two these waste categories declined (ferrous waste went from the 4th largest export to the 8th, and paper waste from the 5th to the 9th), aluminum waste and scrap rose from the 7th to the 6th largest export and copper waste and scrap went from the 6th to the 5th largest export. (See Appendix 1).

<sup>64</sup> The U.S. also exported a wide range of other types of waste and scrap to China in 2009, including plastic, rubber and various other types of metals. U.S. exports of other types of waste and scrap to China totaled over \$489 million in 2009. This does not include reputed illegal exports of waste from the U.S. to China, like toxic e-waste. (For more information on e-waste see 60 Minutes, “Following the Trail Of Toxic E-Waste: 60 Minutes Follows America's Toxic Electronic Waste As It Is Illegally Shipped To Become China's Dirty Secret”, August 30, 2009, <http://www.cbsnews.com/>)

<sup>65</sup> According to a *New York Times* article from 2004, “Much of the material being used to build China's skyscrapers, factories and telecommunications systems – along with many of the products it exports – is derived from scrap, which is usually cheaper than new metal made from ore.” (Andrew Pollack and Keith Bradsher, “China's Need for Metal Keeps U.S. Scrap Dealers Scrounging”, *The New York Times*, March 13, 2004.) According to some sources, paper waste on the other hand may be “re-manufactured into cardboard to pack valuable manufactured goods for export back to the United States.” (Richard McCormack, “U.S. Container Exports Still Dominated By Junk -- Scrap Paper, Scrap Metal and Bulk Commodities”, *Manufacturing and Technology News*, July 31, 2008.)

<sup>66</sup> “Scrap dealers argue that in some cases, the scrap going to China would be of no use to Americans because it would cost too much to sort into its various parts. But with China's cheap labor, that effort is affordable. ‘We send everything to China,’ said Danny C. Yiu, vice president of Ekco Metals... ‘They will use chisels, hammers, hand tools to break this apart and sort it out.’” (Andrew Pollack and Keith Bradsher, “China's Need for Metal Keeps U.S. Scrap Dealers Scrounging”, *The New York Times*, March 13, 2004.)

**Figure 9: Exports (Waste and Scrap, NAICS 910), U.S. to China (2000-2011, NAICS 3-digit)**



#### **Portrait of a Scrap Dealer**

**(excerpt from 2004 New York Times article)**

*"China is very hungry," said David Pan, a Chinese-born scrap metal buyer, as a truck carrying steel reinforcing bars from a dismantled building in San Diego prepared to dump its cargo with a deafening clatter on the floor of his warehouse in Maywood, an industrial town just south of here. "They need a lot of material."*

*A decade ago, Mr. Pan was working in a Los Angeles restaurant when relatives back in China asked him to start buying scrap. Now, as China booms, so does Mr. Pan's business, called Universal Scrap Metals. He ships about 500 containers a month to China filled with battered pipes, fine metal shavings, doorknobs, jumbles of wire, crumpled cars and all other manner of flotsam. He is even negotiating to buy the remains of a steel factory in Utah; he would ship it, as scrap, to his native country. American scrap dealers, an industry of 1,200 or so mainly mom-and-pop operations, are sharing in the boom times.<sup>67</sup>*

*(Excerpted from Andrew Pollack and Keith Bradsher, "China's Need for Metal Keeps U.S. Scrap Dealers Scrounging," The New York Times, March 13, 2004.)*

Since scrap is a low-value product, exporting scrap has involved large volumes of waste going from the United States to China each year.<sup>68</sup> Based upon the high volumes of waste and scrap exported from the

<sup>67</sup> From Andrew Pollack and Keith Bradsher, "China's Need for Metal Keeps U.S. Scrap Dealers Scrounging", The New York Times, March 13, 2004.

<sup>68</sup> Richard McCormack, "U.S. Container Exports Still Dominated By Junk -- Scrap Paper, Scrap Metal And Bulk Commodities", *Manufacturing and Technology News*, July 31, 2008.



U.S. to China, some commentators have drawn strong conclusions. For example, in 2010 Clyde Prestowitz of the Economic Strategy Institute wrote in the *Huffington Post*: “If you want to know what's wrong with America and why record numbers of Americans are telling the pollsters that they're fed up, just take a look at how we trade with China. Our major import is nearly \$50 billion of computer equipment while our major export is about \$8 billion of waste paper and scrap metal. Yes, that's right. We're swapping garbage for computers with China – and lots of other countries as well.”<sup>69</sup>

Likely as a result of the global financial crisis, scrap exports from the United States to China slowed down in 2008 and 2009 (see Figure 9). According to Guan Aiguo, Chairman of the China Resource Recycling Association, “Falling material prices on the international market and fewer bulk commodity transactions, plus weakening export and domestic demand, dragged down waste prices [in 2008].”<sup>70</sup> Most notably, copper and aluminum scrap exports to China in 2009 dropped to pre-2006 levels.<sup>71</sup> However, scrap exports have rebounded in the last two years, jumping from \$7.2 billion in 2009 to \$11.5 billion in 2011.

**The Dangers of Relying upon Waste**  
**(excerpt from 2009 New York Times article)**

*As of 2009, the multibillion-dollar recycling industry had gone into a nosedive because of the global economic crisis and a concomitant fall in commodity prices. As a result, American and European waste dealers who sell to China are finding that their shipments are being refused by clients when they arrive in Asia. The drop in commodity prices was so rapid that in a matter of weeks container ships carrying used railroad wheels and empty dog food cans arrived in Chinese ports worth far less than they had been when they departed Newark, Rotterdam or Los Angeles.*

*“Everything was moving along just fine until October and then we fell off a cliff,” said Bruce Savage, a spokesman for the Institute of Scrap Recycling Industries, a trade organization that mostly represents American waste processing companies. The United States exported \$22 billion worth of recycled materials to 152 countries in 2007. Now the organization estimates the value of American recyclables has decreased by 50 to 70 percent. Western dealers say they are grappling with mounting stockpiles whose value in many cases continues to sink. To make matters worse, Chinese importers have been demanding to renegotiate contracts drastically downward. In some cases, they are refusing to accept shipments they already have a contractual obligation to take.*

*“There are still many containers full of waste sitting at the port in Hong Kong,” Mr. Wang, of China National Resources Recycling Association, said. “It’s hard to say when they’ll be picked up.” According to the association, a ton of copper scrap now sells for \$3,000, down from more than \$8,000 in 2007. Tin is now selling for \$5 a pound, down from \$300. Paper has sagged by as much as 80 percent. “People in this*

<sup>69</sup> Clyde Prestowitz, “America Needs a New Globalization Game”, *The Huffington Post*, April 29, 2010.

<sup>70</sup> China Daily, “Slowdown Hurts China’s Scrap Metal Dealers”, December 10, 2008.

<sup>71</sup> Copper and aluminum scrap exports fell from a combined \$3.56 billion in 2008 to only a combined \$2.62 billion in 2009.

industry were once making a killing taking waste from overseas, but the era of huge profits is now over,” Mr. Wang said.

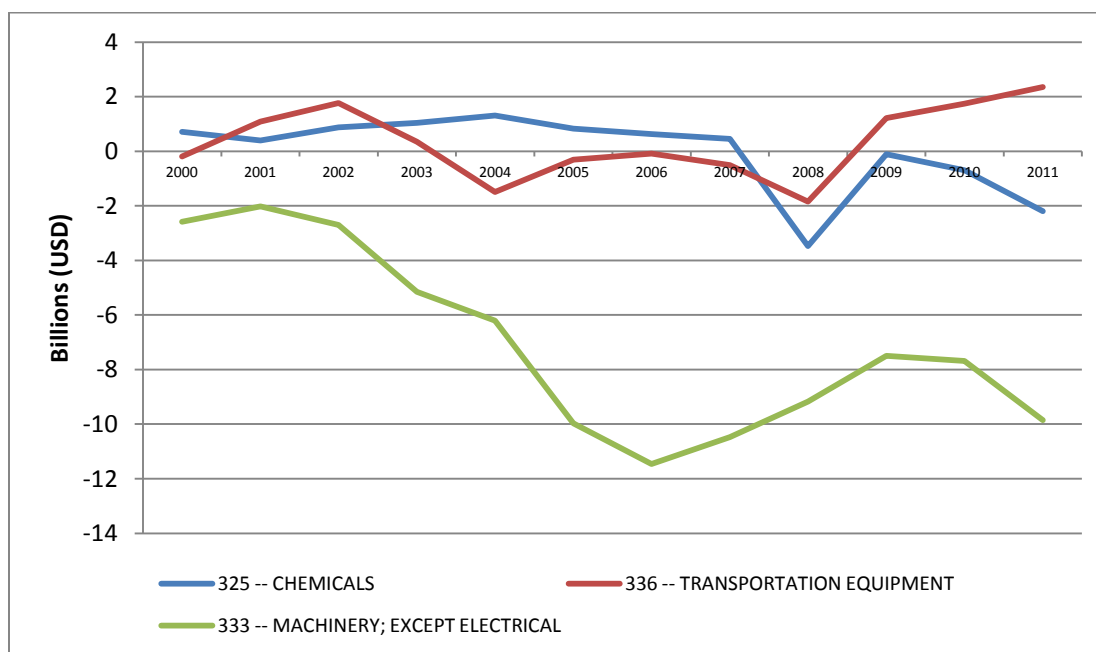
Now waste traders in the United States are shutting mills, cutting production and selling their stock at fire-sale prices. George Adams, president of SA Recycling, which processes metal at 40 recycling plants in the western United States, said he wrote down \$10 million in losses in October. ‘That inventory is gone now, but the pain I won’t soon forget,’ said Mr. Adams, who ships much of his product to China.<sup>72</sup>

(Excerpted from Dan Levin, “China’s Big Recycling Market Is Sagging,” The New York Times, March 11, 2009).

## **Manufactured Goods**

The share of manufactured goods in U.S. exports to China decreased from around 84.5 percent in 2000 to 68.7 percent in 2011.<sup>73</sup> The U.S. runs a major trade deficit with China in terms of manufactured goods, which has grown substantially from 2000 to 2011. The primary source of this deficit is computer and electronic products. Among major U.S. manufactured exports to China, the only U.S. trade surplus is a modest surplus in the category of transportation equipment (see Figure 10).<sup>74</sup>

**Figure 10: Trade Balance (Major U.S. Exports, except Computers and Electronics), U.S. and China (2000-2011), NAICS 3-digit**



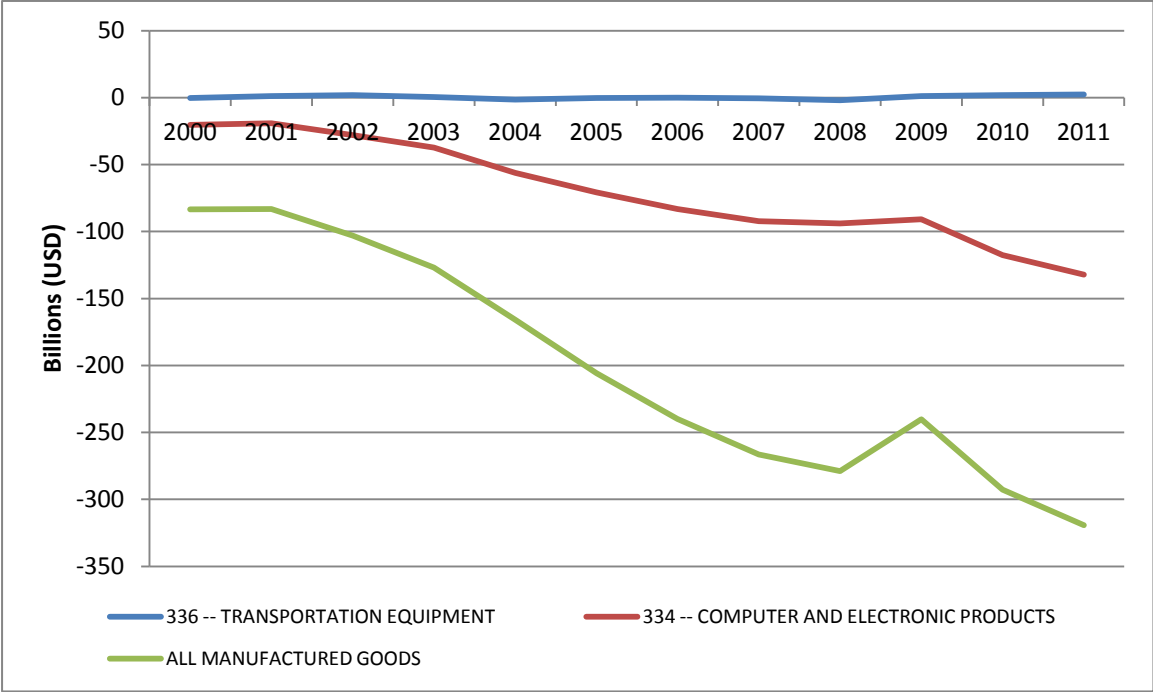
<sup>72</sup> Dan Levin, “China’s Big Recycling Market Is Sagging”, *The New York Times*, March 11, 2009.

<sup>73</sup> In particular, computers & electronics declined from 26.1 percent of all U.S. exports to China in 2000 to around 16.6 percent in 2010.

<sup>74</sup> In 2010, amongst all manufactured goods, the U.S. also had an even smaller trade surplus with China in beverages & tobacco products (NAICS 312) and petroleum and coal products (NAICS 324).

Compared with the massive trade deficit in computer and electronic products and in manufactured goods more generally, the significance of the small surplus in transportation equipment is marginal at best (see Figure 11).

**Figure 11: Trade Balance (Transportation Equipment vs. All Manufactured Goods), U.S. and China (2000-2011, NAICS, 3-digit)**



One potential explanation for the growing imbalance between the U.S. and China in manufactured imports and exports is that “U.S. manufacturers have abandoned products with thin profit margins, like consumer electronics, toys and shoes. They've ceded that sector to China, Indonesia and other emerging nations with low labor costs. Instead, American factories have seized upon complex and expensive goods requiring specialized labor: industrial lathes, computer chips, fighter jets, health care products.”<sup>75</sup>

To test this hypothesis and better understand the composition of major U.S. manufactured goods exported to China, this paper will now examine the top three categories of manufactured products exported from the United States to China in greater detail.

<sup>75</sup> Paul Wiseman, “Despite China's might, US factories maintain edge”, *Associated Press*, January 31, 2011.

## What is the Impact of U.S.-China Trade on American Jobs?

According to the U.S. Bureau of Labor Statistics, the number of U.S. manufacturing jobs fell from 12.2 million to 8.1 million during the past decade; this represents more jobs lost in the manufacturing sector than in the previous two decades combined. From the first quarter of 2001 to the first quarter of 2010, 39 percent of U.S. manufacturing plants with over 250 employees closed.<sup>76</sup> A transition in the United States from exporting manufactured to non-manufactured goods, coupled with increased imports of manufactured goods from China, has almost certainly negatively impacted production capacity and employment levels in a number of U.S. manufacturing industries. However, it has also directly and indirectly created jobs in sectors that have benefitted from more open trade with China. It is difficult to accurately estimate the net number of jobs lost and created as a result of increased trade between the United States and China. Furthermore, existing research on this issue may be heavily influenced by ideological outlook or institutional interests.

According to Clyde Prestowitz of the Economic Strategy Institute, there is no doubt that American manufacturing decline is closely associated with China's manufacturing rise:

*From 24 percent of GDP in 1980, manufacturing has fallen by more than half to less than 12 percent of GDP today. To some extent this is a natural development as all developed countries tend to create larger service sectors as their economies mature. But the relative shrinkage of the U.S. manufacturing sector has been extreme in comparison to countries such as Japan (18.3 percent of GDP), Germany (22 percent), France (15 percent), and even the UK (13 percent). The U.S. decline has been particularly brutal in the past eight years, during which it has lost about a third (from 17 percent to 11.8 percent) of its share of GDP as 40,000 manufacturing plants closed their doors. For instance, the American steel industry that produced 97.4 million tons in 1999 managed to do only 91.5 million tons in 2008 even as Chinese production rose from 124 million to 500 million tons over the same period. Between 2000 and 2008, 270 major U.S. furniture factories closed as the industry lost 60 percent of its production capacity and the market share of imports rose from 38 percent to nearly 70 percent. The U.S. machine tool industry—the backbone of any industrial economy and essential to defense production—produced only \$3.6 billion in equipment, less than 5 percent of world production, down 30 percent from 1998, and only about half of U.S. consumption. In contrast, Germany, Japan, and even Italy currently produce more machine tools than the United States. Chemical plants are another essential element of an industrial economy. In 2008, 80 major plants costing in excess of \$1 billion were being constructed somewhere in the world. None of them was being constructed in the United States.<sup>77</sup>*

According to Dr. Robert Scott of the Economic Policy Institute, a think tank associated with the U.S. labor union movement, between 2001 and 2011, the U.S.-China trade deficit “eliminated or displaced more

<sup>76</sup> Nick Carey and James B. Kelleher, “Does corporate America kowtow to China”, *Reuters*, April 27, 2011.

<sup>77</sup> Clyde Prestowitz, “Clyde Prestowitz: The Betrayal of American Prosperity (Excerpt)”, May 11, 2010, <http://www.progressivereader.com/?p=58997>.

than 2.7 million U.S. jobs, over 2.1 million of which (76.9 percent) were in manufacturing.”<sup>78</sup> According to Scott’s analysis, 1,064,800 U.S. jobs in computer and electronic products were lost during this period. Other hard-hit sectors include apparel and accessories (211,200 jobs), miscellaneous manufactured goods (111,800), and fabricated metal products (120,600). Several service sectors were also hard hit by indirect job losses, including administrative, support and waste management services (160,600) and professional, scientific, and technical services (145,000).<sup>79</sup> The overall job loss calculation in this 2012 study (approximately 2.7 million jobs) is lower than figures released by the Economic Policy Institute in its 2011 report, which estimated a overall loss of 2.8 million U.S. jobs between 2000 and 2010.<sup>80</sup>

There have been a wide range of responses to this critical analysis. Daniel J. Ikenson of the libertarian, pro-free trade Cato Institute counters that “EPI’s methodology is not taken seriously by most economists because it approximates job gains from export value and job losses from import value, as though there were a straight line correlation between the figures. And it pretends that imports do not create or support U.S. jobs.”<sup>81</sup>

In a similar vein, Dr. Penelope Prime of Mercer University explains that to measure the impact of trade on employment, one cannot simply identify imports as a job-destroying aspect of trade, and exports as a job-creating facet of trade. For example, there are jobs connected to imports, as well as jobs connected with capital flows and government services. Moreover, it is difficult to separate out jobs lost as a result of trade with China from jobs lost as a result of technological change over the past decade. Prime ultimately contends that trade with China has caused employment in the United States both to grow and to shrink, depending upon the type of job in question: i.e. fewer manufacturing jobs and more service related jobs.<sup>82</sup>

An even more positive view of the U.S.-China trade relationship is taken by *Future of U.S. China Trade.com*.<sup>83</sup> According to this organization, “Between 1978 and 2008, the real value of goods and services imported to the United States increased 482 percent, from \$328 billion to \$1.9 trillion (in 2000 dollars) – reflecting the dramatic increase in global economic integration. At the same time, people in America got much richer; real GDP expanded by 132 percent and total civilian employment rose by 49.3 million jobs.”<sup>84</sup>

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<sup>78</sup> Robert E. Scott, “Growing U.S. trade deficit with China cost 2.7 million jobs between 2001 and 2011,” Economic Policy Institute, August 23, 2012. <http://www.epi.org/publication/bp345-china-growing-trade-deficit-cost/>

<sup>79</sup> Robert E. Scott, “Growing U.S. trade deficit with China cost 2.7 million jobs between 2001 and 2011,” Economic Policy Institute, August 23, 2012. <http://www.epi.org/publication/bp345-china-growing-trade-deficit-cost/>

<sup>80</sup> Robert E. Scott, “Growing U.S. trade deficit with China cost 2.8 million jobs between 2001 and 2010”, September 20, 2011, Economic Policy Institute, [www.epi.org](http://www.epi.org)

<sup>81</sup> Daniel Ikenson, “China Trade and American Jobs”, Cato Institute, April 2, 2010. [http://www.cato.org/pub\\_display.php?pub\\_id=11652](http://www.cato.org/pub_display.php?pub_id=11652)

<sup>82</sup> Trevor Williams, “The China Trade Deficit and U.S. Job Loss: Interview with an Economist”, Global Atlanta, April 9, 2010, [www.globalatlanta.com](http://www.globalatlanta.com)

<sup>83</sup> This is a joint product of Arizona State University and the Kearny Alliance, whose mission is “Aid through Trade”.

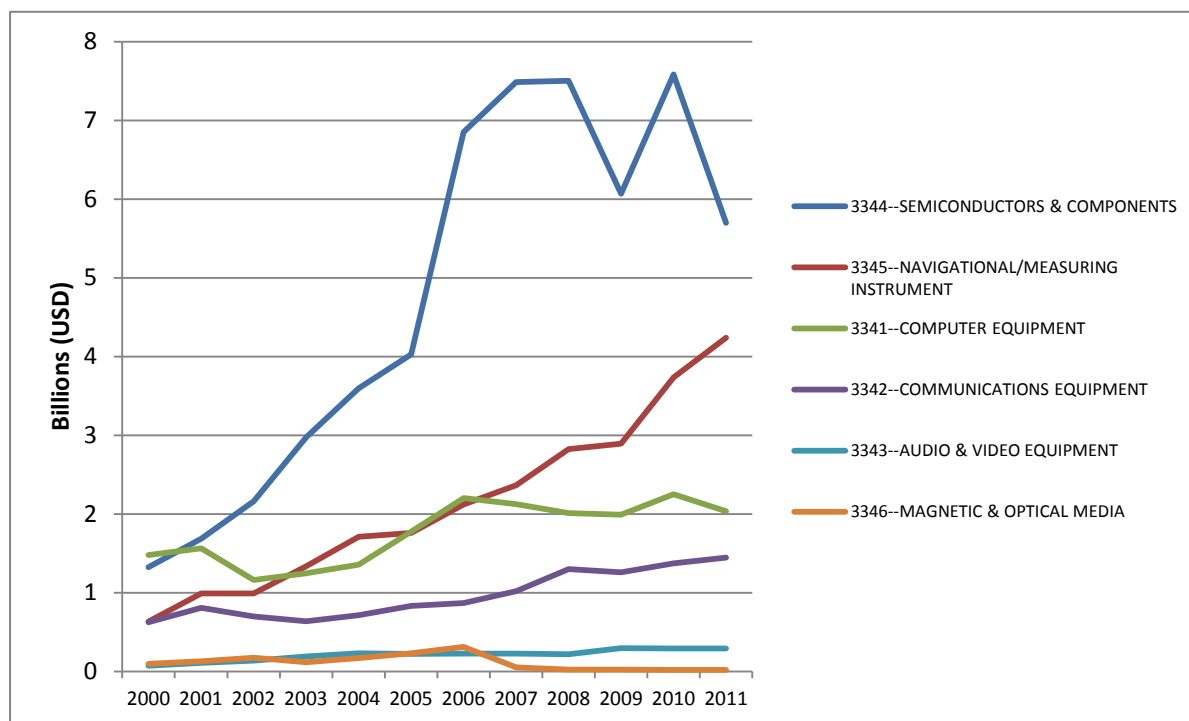
<sup>84</sup> “Has China Really Stolen American Jobs?”, <http://www.futureofuschinatrade.com/article/us-china-trade-analysis-has-china-really-stolen-american-jobs>

That said, Scott and Prestowitz are not alone in believing that current trends in U.S. trade with China have had a negative net impact upon jobs. For example, looking not at import and export figures but at currency valuation, other economists have assessed that the undervaluation of China’s renminbi has had a serious negative impact on U.S. employment. For example, Fred Bergsten, the director of the Peterson Institute for International Economics, has estimated that every “\$1 billion of exports supports about 6,000 to 8,000 (mainly high-paying manufacturing) jobs in the United States,” and that therefore “a trade correction [RMB revaluation] would generate an additional 600,000 to 1.2 million jobs.”<sup>85</sup>

### Computers and Electronic Products

Exports of computers and electronic products from the United States to China have grown more than three-fold, from a value of \$4.2 billion in 2000 to \$13.7 billion in 2011. However, the composition of these exports has shifted dramatically over this period – away from assembled products, and towards sales of individual components such as semi-conductors.<sup>86</sup> There has also been growth in exports of measuring and control instruments, which can also be used as components in electronic products (see Figure 12).

**Figure 12: Exports (Computers and Electronics), U.S. to China (2000-2011, NAICS 4-digit)**



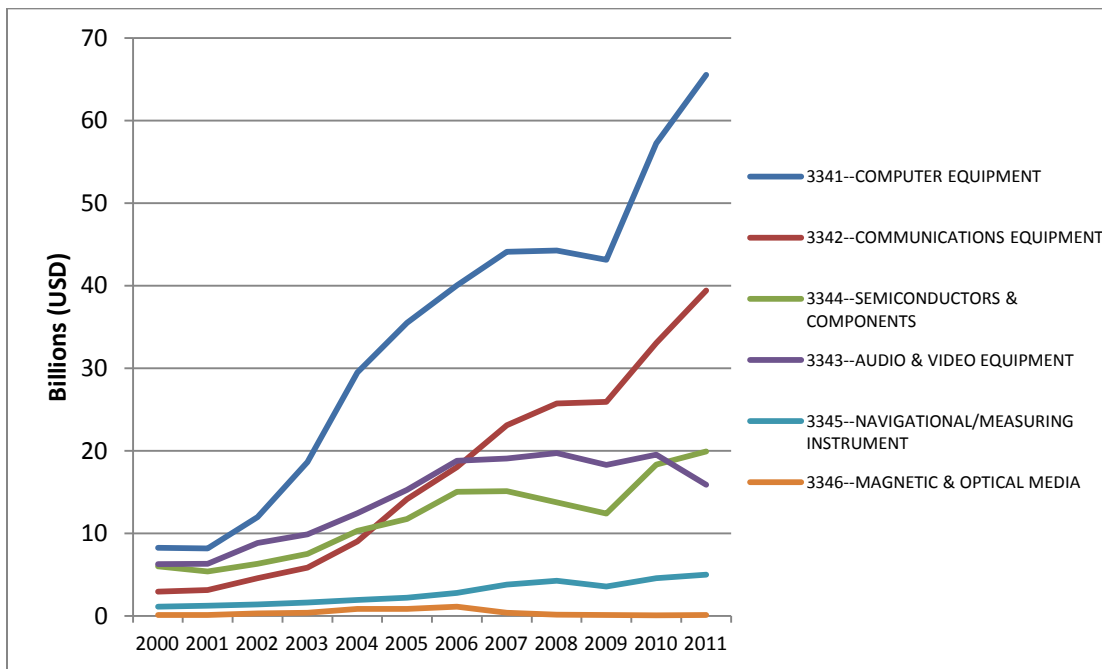
<sup>85</sup> Fred Bergsten, “Beijing Is Key to Creating More U.S. Jobs”, *Foreign Policy*, April 14, 2010.

<sup>86</sup> Computer equipment was the top subcategory and fell from 34.9 percent in 2000 to only 15.9 percent in 2009. Semiconductors and other electronic components rose from 31.3 percent in 2000 to 48.4 percent in 2009.

According to an October 2009 report by research staff at the United States International Trade Commission, “Semiconductors dominate [high-tech exports], representing about 90 percent of U.S. electronic advanced technology product (ATP) exports to China in 2008. Information & communication goods have also been a prominent type of U.S. ATP exports to China. Machine parts, voice and data imaging machines and parts, processing and phone parts make up the products in that category grouping. Taken together, such products can be broadly considered intermediary goods that the United States ships to China as components for final assembly of other products.”<sup>87</sup>

At the same time that U.S. exports of computer and electronics intermediary goods have increased to China, computers and electronics imports from China have grown from \$24.7 billion to \$145.8 billion from 2000 to 2011. This growth has been fueled primarily not by intermediary goods or components from China, but by computer equipment<sup>88</sup> (e.g. laptops), communications equipment (e.g. mobile phones) and audio & video equipment (e.g. televisions) (see Figure 13).

**Figure 13: Imports (Computers and Electronics), China to U.S. (2000-2011, NAICS 4-digit)**



Overall, the U.S.-China trade imbalance in computers and electronics grew markedly between 2000 and 2011, rising from \$20.5 billion in 2000 to \$132.1 billion in 2011. Since computer and electronics products are the 2nd largest U.S. export to China and the top U.S. import from China, it seems possible that this imbalance was partially fueled by components first exported (directly or indirectly) from the United States to China, and then re-imported to the U.S. as parts of assembled computers and other electronics products (notebooks, cell phones, televisions, etc.). According to Derek Scissors of the Heritage

<sup>87</sup> Alexander Hammer, Robert Koopman and Andrew Martinez, “U.S. Exports of Advanced Technology Products to China”, U.S. International Trade Commission, October 2009.)

<sup>88</sup> Computer equipment has risen particularly sharply, from \$8.25 billion in 2000 to \$43.1 billion in 2009.

Foundation, “The U.S. and PRC are both part of the global production chain in advanced goods, where the U.S. provides inputs such as semiconductors and measuring devices, which China assembles into computers and audio–visual equipment.”<sup>89</sup>

### **Restrictions on Sales of “Dual-Use” High Technology Products to China**

Chinese officials have asserted that the U.S.-China trade imbalance in high-tech equipment is not solely derived from market forces, but also reflects U.S. export restrictions on certain high-tech products – and that a relaxation of U.S. export controls would help to correct the immense bilateral trade deficit.<sup>90</sup> This is a complex and controversial point, which has drawn both critics and supporters.

Unlike export controls in many other countries, “in the United States, for the most part, export control policy centers around limitations on exports of advanced technologies (also called ‘dual-use’ technologies) that could be used to compromise U.S. national security.”<sup>91</sup> Dual use technologies are technologies that potentially have both civilian and military applications.

To “ease regulatory burdens for US exporters that seek to tap the enormous China market,” the U.S. Department of Commerce introduced the “Validated End User” (VEU) authorization program in 2008.<sup>92</sup> The full implementation of the program for China was announced on January 13, 2009, and “permits civilian companies in China, who pass a rigorous national security review and agree to strict follow-on compliance obligations, to receive under a VEU-specific authorization the same U.S.-controlled items they could previously receive under individual Commerce Department licenses.”<sup>93</sup> Critics of the program have challenged such moves on national security grounds, as in June 2009 when Rep. Edward Markey (MA-7) asserted that the program did an inadequate job of investigating the backgrounds of Chinese companies, and that it could undermine international counter-proliferation initiatives.<sup>94</sup>

The Obama administration has expressed a commitment to reforming the export control system. In May 2010, then-U.S. Commerce Secretary Gary Locke told students at China’s Tsinghua University that “the

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<sup>89</sup> Derek Scissors, “US-China Trade Numbers Reveal Political Risk”, The Heritage Foundation, February 14, 2011.

<sup>90</sup> “Some U.S. analysts have expressed concern over the composition of U.S. exports to China, noting that much of it consists of scrap products and components, as opposed to high value assembled products. They contend that restrictive Chinese trade practices and industrial policies have a major impact on the composition of U.S. exports to China. Chinese officials counter that U.S. export controls on high technology significantly reduce potential U.S. exports to China.” (Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 4.).

<sup>91</sup> Joanna Bonarriva, Michelle Koscielski, and Edward Wilson, “Export Controls: An Overview of their Use, Economic Effects, and Treatment in the Global Trading System”, Office of Industries: U.S. International Trade Commission, August 2009, p. 1.

<sup>92</sup> Christopher F. Corr and Jason T. Hungerford, “The Struggles of Shipping Dual-Use Goods to China”, January–February 2010 chinabusinessreview.com, p. 45.

<sup>93</sup> Wendell Minnick, “U.S. Eases Restrictions on Dual-Use Exports to China”, Defense News, 01/19/09.

<sup>94</sup> “Rep. Markey Slams New Export Rule Favoring Chinese Company,” Wisconsin Project on Arms Control, June 10, 2009. <http://www.wisconsinproject.org/pubs/editorials/2009/markeyslamsnewrule-061009.htm>.



Obama administration was moving to ease restrictions on exports of high-technology goods to China.”<sup>95</sup> According to a speech by Mr. Locke given on August 31, 2010 in Washington D.C., “We are taking important steps towards streamlining and simplifying our export control system... what we’ve found so far is that about 74 percent of the licensing activity is for parts and components – items like brake pads and the pivot blocks... which, going forward, will likely be moved to the Commerce Control List or decontrolled... A reformed export control system will allow us to focus on the high-risk dual-use technologies that pose the greatest risk to our national security, while permitting greater exports of items that pose little or no risk.”<sup>96</sup>

President Obama spoke on December 9 of the need to reduce the number of sensitive U.S. military and dual-use items restricted for export. Wes Bush, President of the Northrop Grumman Corporation, said: “This action will improve the functioning of the government and protect sensitive and critical U.S. technologies while enhancing industry's ability to compete in global markets.”<sup>97</sup> Similarly, the National Association of Manufacturers “praised Obama’s announcement and said the Milken Institute predicted that modernizing the controls could increase exports in high-value areas and enhance real GDP by \$64.2 billion, create 160,000 manufacturing jobs and raise total employment by 340,000 jobs by 2019.”<sup>98</sup>

However, there are also skeptics of the potential impact of “dual use” export control reforms upon the trade deficit. As stated in a March 2010 op-ed by Kevin L. Kearns, President of the U.S. Business and Industry Council, these “controls affect only a tiny fraction of U.S. exports. At the heart of the companies' complaints are exports to China and 21 other countries of civilian products with possible military uses – the so-called dual-use exports. According to the latest (2007) U.S. government data, however, total U.S. exports to these countries came to only 6.9 percent of total U.S. exports. And of all the exports to these ‘controlled destinations,’ a bare 0.8 percent required a Commerce Department license. So the job and growth effects of U.S. export controls clearly are minimal.”<sup>99</sup>

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<sup>95</sup> Doug Palmer, “Chinese students press Locke on U.S. export controls”, Reuters, May 21, 2010.

<sup>96</sup> Secretary Gary Locke, Remarks to BIS Update Conference, Tuesday, August 31, 2010, Grand Hyatt, Washington D.C.

<sup>97</sup> Hans Nichols and Gopal Ratnam. "Obama Wins Praise for Export Controls Overhaul", Bloomberg Businessweek, 09 September 2010.

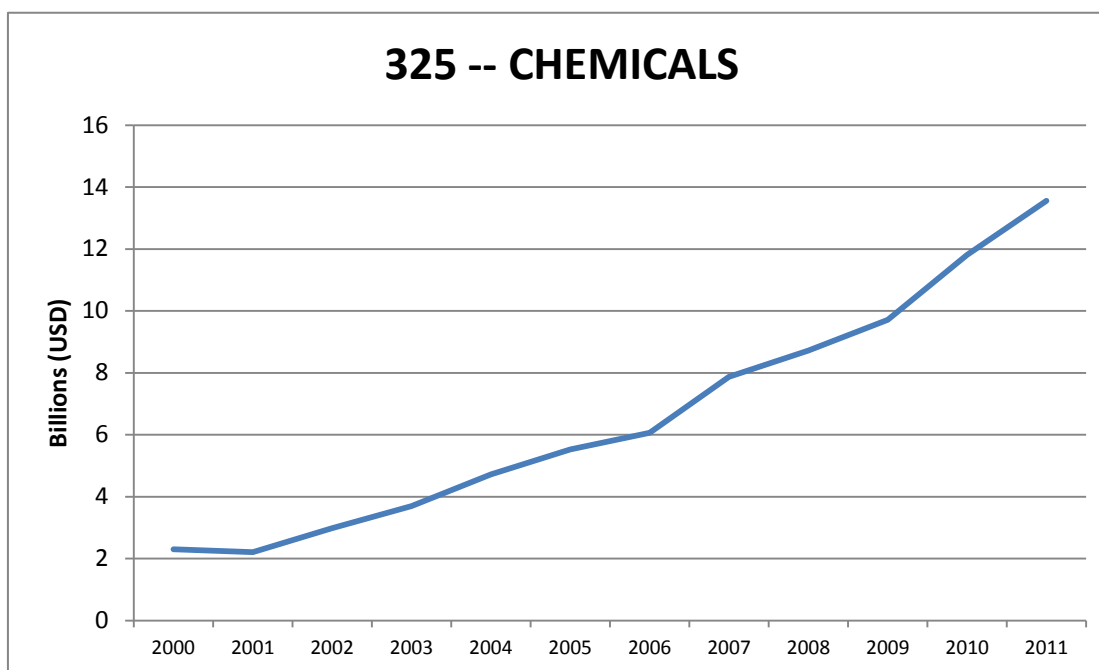
<sup>98</sup> Otto Kreisher, “Obama Revamps U.S. Export Restrictions, Licensing”, *National Journal*, December 9, 2010.

<sup>99</sup> Kevin L. Kearns, “Selling China the digital rope to hang us: Our advanced products can threaten national security”, *Washington Times*, 01 March 2010.

## Chemicals

China's accession to the WTO was predicted to positively affect U.S. exports of chemicals to China, due to reductions of tariffs on chemicals. Although the share of chemical exports among all exports from the United States to China has declined slightly (from 14.3 percent in 2000 to 13 percent in 2011 – see Figures 2 and 3), chemical exports have increased significantly in absolute terms: from \$2.3 billion in 2000 to \$13.6 billion in 2011 (see Figure 14).

***Figure 14: Exports (Chemicals), U.S. to China (2000-2011, NAICS 3-digit)***

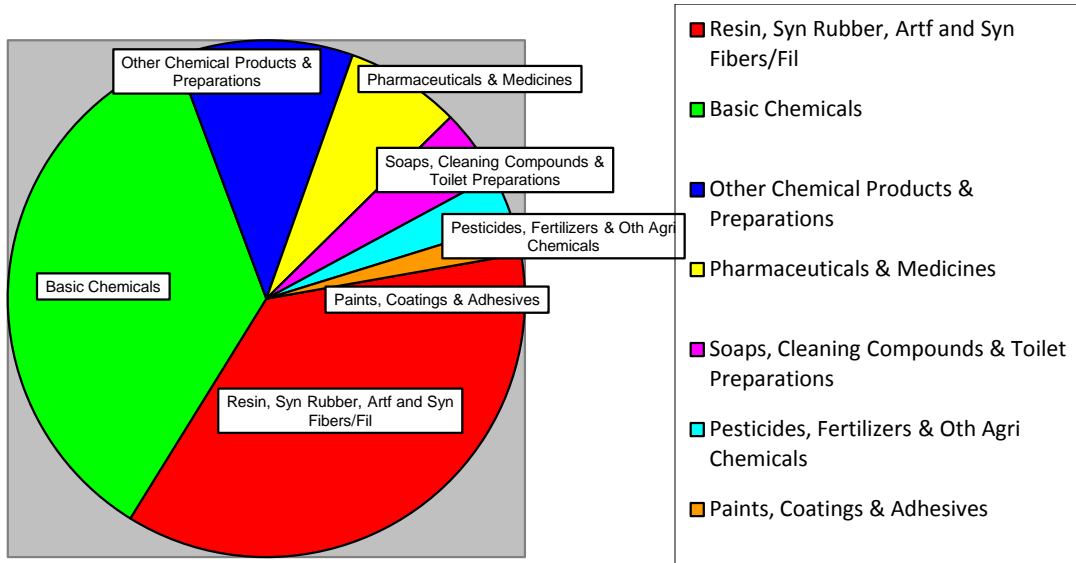


The composition of U.S. chemical exports to China in 2010 was not reflective of U.S. chemical exports to the world as a whole in 2011 (see Figures 17 and 18). In particular, while 24.5 percent of all U.S. chemical exports to the world in 2011 were composed of pharmaceuticals and medicines, pharmaceuticals make up a mere 9.3 percent of U.S. chemical exports to China (see figures 15 and 16).

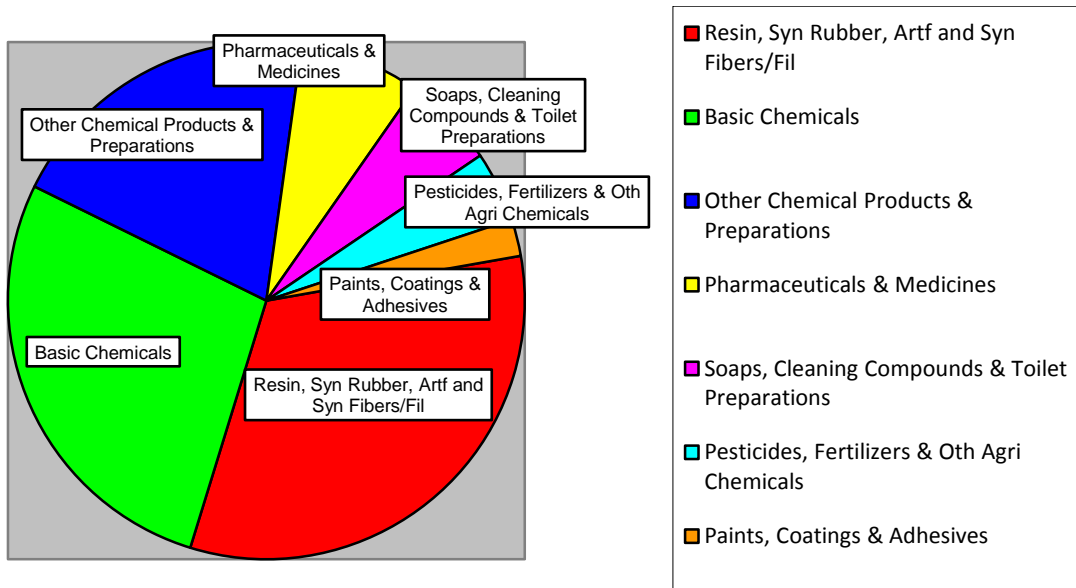
(This is not to say that China does not conduct extensive pharmaceutical trade with the U.S. – only that there are limited pharmaceutical exports from the U.S. to China. For a detailed discussion of U.S. imports of pharmaceutical materials from China, see the Commission-sponsored April 2010 report, *Potential Health & Safety Impacts from Pharmaceuticals and Supplements Containing Chinese-Sourced Raw Ingredients*.<sup>100</sup>)

<sup>100</sup> The U.S. is China's second largest pharmaceuticals importing partner behind Germany, and the "U.S. has been and will be China's largest pharmaceutical trade partner for a long time, as China is aimed to become the world's largest pharmaceutical outsourcing hub, with a focus on North American and European markets." See: *Potential Health & Safety Impacts from Pharmaceuticals and Supplements Containing Chinese-Sourced Raw Ingredients*, report produced by NSD BioGroup LLC on behalf of the U.S. China Economic and Security Review Commission, April

**Figure 15: 2011 U.S. Exports to China of NAICS 324 – Chemicals**



**Figure 16: 2011 U.S. Exports to World of NAICS 325 – Chemicals**

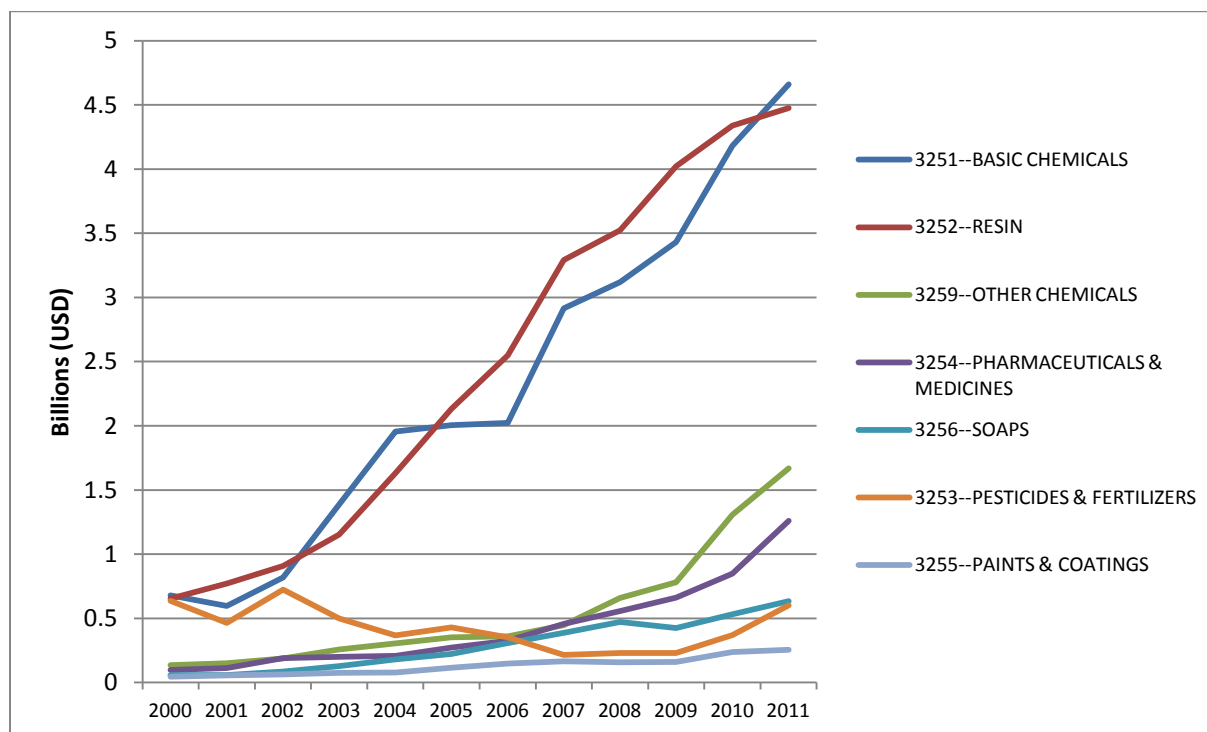


The growth in chemical exports from the United States to China from 2000 to 2011 has not been evenly distributed across all categories of chemicals; rather, most of the growth can be attributed to a growth

2010, p. 17, [http://www.uscc.gov/researchpapers/2010/NSD\\_BIO\\_Pharma\\_Report--Revised\\_FINAL\\_for\\_PDF--14\\_%20April\\_2010.pdf](http://www.uscc.gov/researchpapers/2010/NSD_BIO_Pharma_Report--Revised_FINAL_for_PDF--14_%20April_2010.pdf).

in resin/synthetic rubber and basic chemicals,<sup>101</sup> with moderate growth in other categories such as pesticides and fertilizers (see Figure 17). Combined, these two categories made up 67.4 percent of chemical exports from the U.S. to China in 2011, versus only 57.7 percent in 2000. Since resin and basic chemicals may be used as raw materials, increased U.S. chemical exports from 2000 to 2011 may once again be indicative of China’s growing industrial needs.

**Figure 17: Categories of Chemical Exports, U.S. to China (2000-2011, NAICS 4-digit)**



There was a concurrent decline in the percentage share of exports of pesticides, fertilizers and other agricultural chemicals from 2000 to 2010.<sup>102</sup> This is a significant compositional shift because pesticides, fertilizers and other agricultural chemicals were the most important chemical export from the United States to China through most of the 1990s, and were the second largest chemical export from the U.S. to China as of 2000. Fertilizers were not only important amongst chemicals, but were among the Top 10 of all exported products from the U.S. to China from 2000 to 2003 (see Appendix 1). This decline was reversed in 2011, when pesticide and fertilizer exports from the United States to China jumped to

<sup>101</sup> “Basic chemicals are used primarily in industrial and agricultural applications. These substances are used in producing plastics and agrichemicals as well as synthetic rubbers and fibers, detergents, pharmaceuticals, adhesives, inks, dyes and explosives. Resin, Synthetic Rubber and Artificial Synthetic Fibers and Filaments are mainly used in plastics tied to packaging and consumer markets, construction materials, and automotive parts.” (Georgia Power, “The Chemical Industry in Georgia”, [http://www.georgiapower.com/grc/pdf/chemical/3\\_overview.pdf](http://www.georgiapower.com/grc/pdf/chemical/3_overview.pdf), last accessed February 18, 2011.)

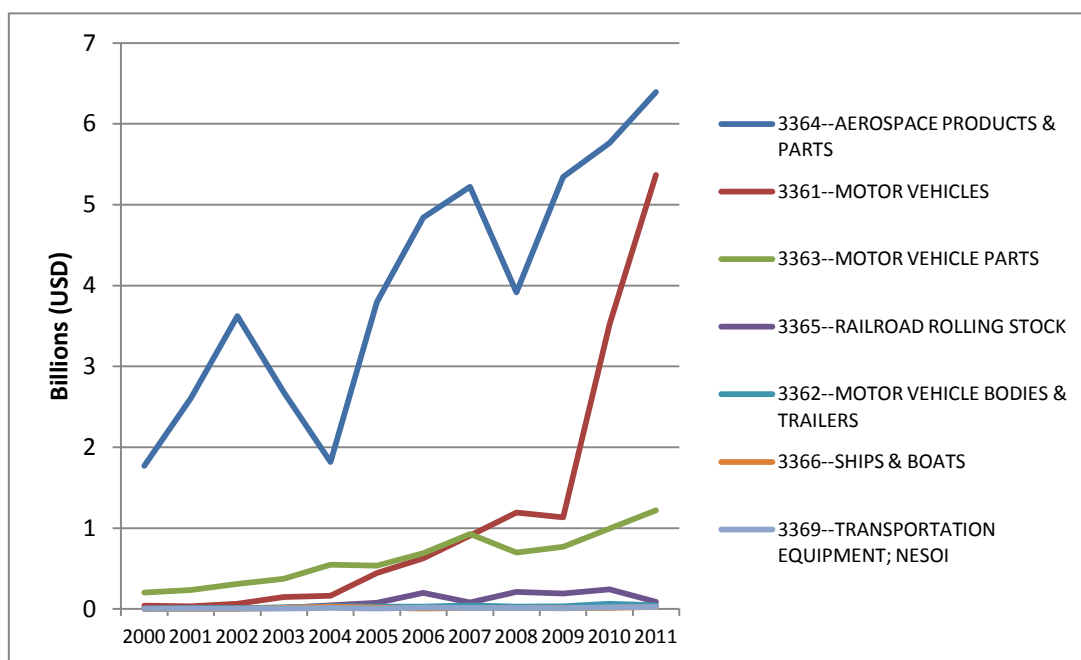
<sup>102</sup> Pesticides, fertilizers and other agricultural chemicals made up 27.6 percent of chemical exports in 2000 (\$637 million), but only 3.1 percent in 2009 (\$369 million).

\$602.1 million, up from \$368.8 million the previous year (see chart on the preceding page). Whether this increase will be sustained remains to be seen.

### **Transportation Equipment**

The export value of transportation equipment from the United States to China rose from \$2 billion in 2000 to \$13.2 billion in 2011.<sup>103</sup> While aerospace products and parts have remained the top transportation equipment export category over this period, the most significant change has been the growth of motor vehicle exports. Motor vehicle exports rose from around \$41 million in 2000 to \$5.4 billion in 2011 (see Figure 18).

***Figure 18: Exports (Transportation Equipment), U.S. to China (2000-2011, NAICS 4-digit)***



### **Aviation**

Aerospace production is a pillar industry within American manufacturing. In 2008, the last year for which data was available, more jobs in the United States were supported by exports of U.S. aerospace products than of any other manufacturing or service industry.<sup>104</sup> Aviation comprised 2.8 percent of the nation’s manufacturing workforce in 2008, and employed over 500,000 Americans in high-skilled and

<sup>103</sup> The share of transportation equipment among all exports from the United States to China declined slightly, from 12.5 percent in 2000 to 11.6 percent in 2010,

<sup>104</sup> U.S. Department of Commerce, “Flight Plan 2011: Analysis of the U.S. Aerospace Industry,” March 2011. [http://trade.gov/wcm/groups/internet/@trade/@mas/@man/@aai/documents/web\\_content/aero\\_rpt\\_flight\\_plan\\_2011.pdf](http://trade.gov/wcm/groups/internet/@trade/@mas/@man/@aai/documents/web_content/aero_rpt_flight_plan_2011.pdf)

high-wage jobs.<sup>105</sup> While the relative dominance of aerospace products and parts among transportation products exports has declined in the decade since China's accession to the WTO,<sup>106</sup> aerospace exports remain strong and there is projected continued strong market demand for decades to come.

According to the U.S. Commercial Service, China is now the world's second largest aviation market.<sup>107</sup> The Boeing Corporation has described the growth of the Chinese civil aviation market as follows:

*The number of passengers carried by China's airlines in 2010 was 3.5 times the total in 2000. The in-service jet fleet more than tripled to 1,750 airplanes by 2010, up from 560 airplanes in 2000. In mainland China, the number of commercial aviation airports increased from 139 in 2000 to 175 in 2010. Volumes of passengers, freight, and airplane arrivals and departures at airports in 2010 increased dramatically (4.2, 3.6, and 3.1 times, respectively) over 2000 levels.*<sup>108</sup>

In 2010, the Civil Aviation Administration of China (CAAC) projected major continued growth in the Chinese aviation sector through the year 2015, to include the addition of 700 more planes to the civil aviation fleet and the opening of 45 new airports.<sup>109</sup> The Boeing Company has estimated that China will need 3,770 new domestic light civil aircraft (LCA) by 2028, accounting for 42 percent of deliveries to the Asia-Pacific region.<sup>110</sup>

Aircraft and parts<sup>111</sup> (see Appendix 1) have been among the top three exports from the United States to China throughout the period from 2000 to 2011. In 2011, aircraft and parts were the second largest export from the United States to China, behind only soybeans. According to a 2011 *CNN Money* report, these sales are not evenly distributed across the U.S. market — rather, the “Boeing [Corporation] accounts for the lion's share of those sales.”<sup>112</sup> According to a report in the *International Business Times*, “Boeing jets are a mainstay in China's air travel and cargo system, representing over 50 percent of all commercial jetliners operating in the country.”<sup>113</sup>

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<sup>105</sup> Michaela Platzer, “U.S. Aerospace Manufacturing: Industry Overview and Prospects”, Congressional Research Service, December 3, 2009, p.1.

<sup>106</sup> Aerospace products and parts have gone from 87.5% of transportation equipment exports (\$1.8 billion) in 2000 to 54.3% (\$5.8 billion) in 2010. Motor vehicles have risen from 2% of transportation equipment exports (\$40.9 million) in 2000 to 33.1% (\$3.5 billion) in 2010.

<sup>107</sup> U.S. Commercial Service, “Aviation: Industry Overview”, accessed February 18, 2011, <http://www.qbmabc.com>

<sup>108</sup> Boeing Corporation, “China Market – a 10-Year Reflection.” <http://www.boeing.com/commercial/cmo/china.html>.

<sup>109</sup> Xin Dingding, “Aviation Sector Has High Hopes for Next 5 Yrs”, *China Daily*, February 25, 2011.

<sup>110</sup> Peder A. Andersen, “China's Emergent Military Aerospace and Commercial Aviation Capabilities,” Testimony before the U.S.-China Economic and Security Review Commission, May 20, 2010.

<sup>111</sup> HS 8800 or 8802.

<sup>112</sup> Steve Hargreaves, “Cashing in on a China Bet”, *CNN Money*, January 25, 2011.

<sup>113</sup> *IB Times*, “China confirmed \$19 billion agreement with Boeing”, January 20, 2011. “The large commercial aircraft fleet comprises 55 percent Boeing airplanes and 43 percent Airbus airplanes. Most of the remaining 2 percent are McDonnell Douglas aircraft produced before McDonnell Douglas's merger with Boeing.” (Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China's Advancing Aerospace Industry”, Rand sponsored by the U.S.-China Economic and Security Review Commission, p. 6.)

Boeing is expected to maintain its market dominance in the immediate future, as “Boeing received final approval on [January 19, 2011] from the Chinese Government confirming a \$19 billion aircraft agreement. The contract involves a delivery of 200 aircraft comprising of 737s and 777s over a period of three years (2011-2013).”<sup>114</sup> Addressing their longer term future in China, the Boeing Corporation’s *Market Outlook 2010–2029* anticipates that Chinese airlines will purchase about 3,900 new aircraft over the next 20 years for their domestic market. This would roughly triple the size of China’s current fleet, valued at \$400 billion.<sup>115</sup>

### **A “Bullet” Aimed at China’s Aviation Market?**

Some analysts believe that once bullet trains are crisscrossing China, the market for larger airliners will not be as robust as currently projected.<sup>116</sup> However, a 2011 report produced for the Commission by analysts at the RAND Corporation provides conditional support for the Chinese aviation market projections produced by the Boeing Corporation.

High-speed rail is widely expected to pose a serious challenge to the airline industry, at least for travel between China’s major coastal urban centers in the east and south of the country. As one analyst observes, the typical air travel time between Shanghai and Beijing, under normal weather conditions, is around 5 hours. The same trip by express high-speed trains would take 5 to 6 hours, without the additional inconveniences necessitated by air travel.

However, the ultimate impact of rail and expanding automotive transit systems on air traffic patterns is more complicated than simple competition between rail and air – there is a real possibility that they might complement one another as well, with business commuters (especially to and from more remote regions) using a combination of rail and air travel to reach their destinations.<sup>117</sup> Based on the analysis of the RAND report, Boeing’s projection of a tripling in size of the PRC civilian aviation fleet over the coming two decades appears reasonable, if an average Chinese real growth rate of 7 to 8 percent is assumed to continue over the next two decades.<sup>118</sup>

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<sup>114</sup> *IB Times*, “China confirmed \$19 billion agreement with Boeing”, January 20, 2011.

<sup>115</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry”, report produced by the RAND Corporation on behalf of the U.S.-China Economic and Security Review Commission, p. 19. See also Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 6.

<sup>116</sup> James McGregor, “China’s Drive for ‘Indigenous Innovation’: A Web of Industrial Policies”, APCO, p. 34.

<sup>117</sup> Therefore, rather than seeing air and rail travel as a zero sum game, the real question is whether or not the Chinese economy (and in particular, currently economically underdeveloped and under-visited geographic regions of China) will continue to develop at or near current rates.

<sup>118</sup> “Ready for Takeoff: China’s Advancing Aerospace Industry”, Rand, Sponsored by the U.S.-China Economic and Security Review Commission, pp. 19-21.

## ***Does “Indigenous Innovation” Threaten U.S. Aviation Exports?***

The current interdependence between a key U.S. export and a single U.S. company (Boeing<sup>119</sup>) carries certain inherent risks. Concerns over these risks are bolstered by China’s policy of “indigenous innovation” and an allegedly systematic encouragement of technology transfers through U.S.-Chinese joint ventures. As Thomas Hour and Pankaj Ghemaway have written,

*Just as securing natural resources often drives China’s foreign policy, shifting the origination of leading technologies to China is driving the country’s industrial policy. In late 2009 China’s Ministry of Science and Technology demanded that all the technologies used in products sold to the government be developed in China, which would have forced multinational companies to locate many more of their R&D activities in a country where intellectual property is notoriously unsafe. After howls of protest from foreign governments and companies, the ministry backed down. However, the government still appears intent on creating a tipping point at which multinational companies will have to locate their most-sophisticated R&D projects and facilities in China, enabling it to eventually catch up with or supplant the United States as the world’s most-advanced economy.*<sup>120</sup>

According to this understanding of Chinese industrial policy, the situation of German high-speed rail projects in China displays the potential pitfalls of joint ventures with Chinese partner companies, and could presage a similar fate for America’s aviation industry. According to Robert Samuelson of *The Washington Post*,

*Initially, foreign firms such as Germany’s Siemens got most contracts [for Chinese high-speed rail projects; however] in 2009, the government began requiring foreign firms to enter into minority joint ventures with Chinese companies. Having mastered the ‘core technologies,’ Chinese companies have captured 80 percent or more of the local market and compete with foreign firms for exports. The same thing is occurring in commercial aircraft.*<sup>121</sup>

There is no doubt that there is a clear trend towards foreign aviation companies engaging more deeply in joint ventures with Chinese partners.<sup>122</sup> For example, GE has announced plans to form a joint venture called GE-AVIC Civil Avionics Systems Co., Ltd. In this partnership, GE will supply avionics technology – the electronics that guide the aircraft – for the C919, China’s competitor passenger airliner to the Boeing

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<sup>119</sup> Boeing’s manufacturing policies also play a critical role in high exports of Boeing airplanes from the United States to China. “Boeing doesn’t have a single manufacturing facility in China. While the company imports parts from around the world, including China, its planes are assembled in the United States.” (Steve Hargreaves, “Cashing in on a China Bet”, CNN Money, January 25, 2011.)

<sup>120</sup> Thomas M. Hout and Pankaj Ghemawat, “China vs the World: Whose Technology Is It?”, *Harvard Business Review*, December 2010.

<sup>121</sup> Robert Samuelson, “China’s new world order demands stronger U.S. response”, *The Washington Post*, January 24, 2011, drawing upon Thomas Hout and Pankaj Ghemaway in the *Harvard Business Review*.

<sup>122</sup> Roger Cliff, Chad J. R. Ohlandt, David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry,” RAND Corporation, 2011.



737 and the Airbus 320.<sup>123</sup> From GE's perspective it is likely simply a question of attempting to expand competencies<sup>124</sup> and improve market share.<sup>125</sup> Despite the long-term risks this might pose for GE, such risks are seen as being par for the course in China, since "doing business in China, often requires Western multinationals like GE to share technology and trade secrets that might eventually enable Chinese companies to beat them at their own game – by making the same products cheaper, if not better."<sup>126</sup>

What makes the GE-AVIC joint venture of particular concern — not just for GE as a company but more broadly for aviation exports from the United States as a whole — is the size and level of government involvement in GE's state-owned partner, China Aviation Industry Corporation (AVIC).<sup>127</sup> According to Clyde Prestowitz, "The deal will result in transfer of most, if not all, of GE's advanced avionics technology to the joint venture with the strong possibility that it will also find its way to AVIC and/or others in China outside the joint venture as other technologies have been doing in similar cases in other industries."<sup>128</sup>

General Electric is by no means alone in supplying aviation technology to China. As James McGregor of APCO puts it, in its desire to

*...design and manufacture a large commercial aircraft that can compete with Boeing and Airbus...  
China has set the year 2014 as the target for the first test flight of its home-grown 150-seat*

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<sup>123</sup> Robert Samuelson, "China's new world order demands stronger U.S. response", The Washington Post, January 24, 2011. David Barboza, Christopher Drew, and Steve Lohr. "G.E. to Share Jet Technology With China in New Joint Venture", The New York Times, January 17, 2011.

<sup>124</sup> "GE Aviation is best known for its gas turbine engines, but its purchase of Smiths Aviation in 2007 signaled an intent to be as strong in commercial avionics. Smiths plays a major role on the 787 as the builder of the common core computing system, but its reputation is as an avionics supplier, not a prime manufacturer. GE's purchase of Smiths was to build it up to become a prime contractor; its partnership with Avic is the means to that end. For Avic, teaming with GE is a means to the end of establishing the Chinese company's importance in avionics manufacture. The emphasis on civil projects is intended to get past U.S. export control regulations." (Michael Mecham, "GE, Avic Sign Deal With Goal Of Dominating Avionics Market", *Aviation Week*, January 25, 2011.)

<sup>125</sup> "General Electric is counting on a joint venture with Avic to propel the company into the front ranks of avionics suppliers, just as its 50-50 partnership with France's Snecma turned CFM International into a powerhouse engine maker. With Chinese President Hu Jintao and U.S. Commerce Secretary Gary Locke looking on, GE Aviation President and CEO David Joyce and Avic Senior VP Zhang Xinguo signed an agreement Friday [January 21, 2011] in Chicago to form a joint venture—GE-Avic Civil Avionics Systems Co., Ltd.—in Shanghai." (Michael Mecham, "GE, Avic Sign Deal With Goal Of Dominating Avionics Market", *Aviation Week*, January 25, 2011.)

<sup>126</sup> David Barboza, Christopher Drew and Stephen Lohr, "GE to Share Jet Technology with China in New Joint Venture," *The New York Times*, January 17, 2011.

<sup>127</sup> "China Aviation Industry Corporation (AVIC) is an ultra large state-owned enterprise and an investment institution, authorized and managed by the Central People's Government. It is reorganized from AVIC I and AVIC II. The AVIC group oversees a wide range of business units, including defense, transport aircraft, aviation engine, helicopters, avionics, electromechanical systems, general aviation aircraft, aviation research and development, flight test, trade & logistics and asset management. It has nearly 200 subsidiaries (branches) and over 20 listed companies with a total of 400,000 employees. AVIC was ranked 330th in the Global Fortune 500 for 2010. It was the first Chinese aviation industrial company to make it into the rarified league." (GE Aviation Press Release, "GE and AVIC Sign Agreement for Integrated Avionics Joint Venture", January 21, 2011, <http://www.geaviation.com/>)

<sup>128</sup> Clyde Prestowitz, "Can Immelt Serve Both Obama and GE?", *Harvard Business Review*, January 24, 2011.

*airliner, known as the C919... The Chinese government's core strategy for assembling the C919 is to trade market access for technology. Foreign players have been lining up to integrate their technology into the C919 design via technology transfers and joint development. Parker Aerospace, General Electric, Honeywell and Goodrich have all partnered with various Chinese entities or [AVIC]... the Chinese government also envisions the C919 as a global product with a price that will substantially undercut the Boeing 737 and Airbus A320.<sup>129</sup>*

The nature of China's political economy allows the Chinese government to apply political and developmental priorities to what, in the United States, might be viewed more narrowly as strictly business decisions. According to an economics writer Steven Pearlstein:

*With its state-controlled economy, China can force its companies to act collaboratively to achieve the country's strategic economic objectives. And that gives it a tremendous advantage in negotiating the terms of trade with a country like ours, where China can strike deals that may provide short-term profits to one company and its shareholders but in the long run undermine the competitiveness of the other country's economy. What's good for GE or Honeywell or Rockwell is [not necessarily] good for America and American workers.<sup>130</sup>*

It is possible that some of these concerns (especially related to Chinese firms acquiring most if not all of their U.S. partner's advanced avionics technology) may not impact U.S. aviation exports in the short-term future. According to a recent RAND study commissioned by the U.S.-China Economic and Security Review Commission, "Western companies [who are partnering with Chinese firms] have a vested interest in maintaining control of their core intellectual property, which likely explains why most of the technologies planned for the C919 are, with a few exceptions, already currently deployed in modern airliners."<sup>131</sup> That said, while

*Western aerospace companies have been generally cautious about transferring advanced technology to China or setting up joint ventures in critical areas... a turning point may have been reached with the Commercial Aircraft Corporation of China (COMAC) C919 project... COMAC management has made it explicitly clear that foreign bidders on the C919 program are expected to form joint ventures with Chinese partners, especially in high-technology areas such as advanced materials and flight control systems, where Chinese technology is lagging. In areas of less concern, the Chinese are content with traditional subcontracting or other work-share arrangements, although... local production is considered a minimum requirement for foreign suppliers to the C919 program.<sup>132</sup>*

On this topic, the report concludes that "all wide-body aircraft will be imported at least through 2020. Although Chinese airlines will apparently be required to buy at least some C919s, their preference, and that of their customers, will continue to be for Boeing and Airbus aircraft with proven safety and

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<sup>129</sup> James McGregor, "China's Drive for 'Indigenous Innovation': A Web of Industrial Policies", APCO, p. 34.

<sup>130</sup> Steven Pearlstein, "Chinese follow same old script (and they get the punch line)", *The Washington Post*, January 18, 2011.

<sup>131</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, "Ready for Takeoff: China's Advancing Aerospace Industry", Rand sponsored by the U.S.-China Economic and Security Review Commission, p. 41-42.

<sup>132</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, "Ready for Takeoff: China's Advancing Aerospace Industry", Rand sponsored by the U.S.-China Economic and Security Review Commission, p. 43.

reliability records. If the C919 can establish a comparable safety and reliability record, however, and can offer improved comfort and fuel efficiency, it is possible that, over time, it will begin to take market share away from Boeing and Airbus (provided, of course, that Boeing and Airbus do not bring to market even better aircraft in the meantime).<sup>133</sup>

With decidedly more optimism the report projects that “the markets for cargo aircraft, general aviation, and helicopters in China, although significantly smaller than that for passenger aircraft, are also expected to grow rapidly in the coming years.”<sup>134</sup> In particular, with regards to fixed-wing general aviation aircraft, the report states that:

*As of late 2009, the nation’s severely restrictive airspace management regime had limited the number of fixed-wing general aviation aircraft in China to about 800 (compared with 230,000 in the United States). Reforms are under way, however, and the number of fixed-wing general aviation aircraft in China is expected to increase by 30 percent per year over the next five to 10 years, resulting in more than 10,000 new aircraft by 2020.*<sup>135</sup>

*A particularly attractive segment of the general aviation market may be business aviation. According to industry data, as of the end of 2009, there were 50,000 business aircraft in the world, 18,000 of them in the United States alone. Even a developing country such as Brazil boasted 2,000 business aircraft, whereas China had only 30 in commercial operation at that time... Since China does not appear to have an indigenous business-aircraft development program, all of these aircraft will presumably have to be imported.*<sup>136</sup>

## **Motor Vehicles**

The marked growth in U.S. automotive exports to China since 2008 has primarily been in assembled vehicles (as distinct from automotive parts). In 2008 and 2009, motor vehicles were the 10th largest export from the United States to China, and in 2011 became the 3rd largest category (see Appendix 1). According to September 2010 commentary from the Democratic Leadership Council:

*[I]n 2005 American auto plants - including production by Big Three and international car companies – made 11.5 million cars, SUVs and pickup trucks. Of these, 1.9 million went abroad, with 1.15 million going to Canada and Mexico and another 120,000 to Germany. In the crisis year 2009, production fell to 5.6 million, mainly because of the drop in buying at home, while 1.7 million went abroad. If their early figures for 2010 hold up through the fall, production will rebound to about 9.3 million cars and trucks, and exports will jump to 2.5 million.*

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<sup>133</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry”, Rand sponsored by the U.S.-China Economic and Security Review Commission, p. xii.

<sup>134</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry”, Rand sponsored by the U.S.-China Economic and Security Review Commission, p. 5.

<sup>135</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry”, Rand sponsored by the U.S.-China Economic and Security Review Commission, p. xii.

<sup>136</sup> Roger Cliff, Chad J. R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry”, Rand sponsored by the U.S.-China Economic and Security Review Commission, p. 10-11.

*Some of this reflects reviving sales to Mexico and Canada – but car exports to China are rising at a dramatic rate, with sales tripling in a single year.<sup>137</sup> The jump lifts China above Germany as the 3rd-largest American automobile buyer this year (up from 10th in 2005 and 48th in 2000), the U.S.' largest trade-surplus country for vehicles (though still much more a supplier than buyer of auto parts) – and also lifts China above Japan and Germany as Michigan's third-ranking export market.*

*The jump has lifted Michigan state exports by 38 percent this year – the fastest growth among the top ten exporting states. The state has picked up about 150,000 jobs this year; its unemployment rate has dropped from 14.5 percent in January to 13.1 percent in August, and from 16 percent to 14 percent around Detroit.<sup>138</sup>*

From 2000 to 2011, the export value of motor vehicles from the United States to China has risen around 86 times, from \$40.9 million in 2000 to \$5.4 billion in 2011. This growth in exports appears to be driven by market forces: “China surpassed the United States as the world's largest automobile market [in 2008].”<sup>139</sup> The Chinese government projects that by 2020, there will be 140 million cars in China (seven times the current level), and that the number of cars sold annually will rise from 8.63 million units (as of 2008) to 20.7 million units (by 2020).<sup>140</sup>

While there are latent dangers that could slow this projected long-term growth (for example, major congestion across large cities in China,<sup>141</sup> a consideration that has already prompted action in cities like Shanghai and Beijing to attempt to limit the number of new cars on the road<sup>142</sup>), American automakers are active in increasing both sales in, and exports to, the Chinese market. GM in particular has already established such a dominant position in the Chinese market<sup>143</sup> that its sales in China now outpace its

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<sup>137</sup> According to the Department of Commerce's International Trade Administration, U.S. automobile vehicle exports to China totaled \$1.02 billion in 2009 and rose to \$3.4 billion in 2010 (a 332.5 percent increase). U.S. automobile parts exports totaled \$937 million in 2009 and rose to \$1.28 billion in 2010 (a 136.4 percent increase). See International Trade Administration, “Automotive (Vehicles and Parts) Trade Data, Imports and Exports of Automotive Equipment 2000-2010,” [http://trade.gov/wcm/groups/internet/@trade/@mas/@man/@aai/documents/web\\_content/auto\\_stats\\_auto\\_trade\\_pdf.pdf](http://trade.gov/wcm/groups/internet/@trade/@mas/@man/@aai/documents/web_content/auto_stats_auto_trade_pdf.pdf).

<sup>138</sup> Democratic Leadership Council, “Auto exports to China are up six-fold this year”, Trade Fact of the Week, September 29, 2010.

<sup>139</sup> Jerry Hirsch, “GM's China sales top U.S. total, a first for the automaker”, Los Angeles Times, January 25, 2011.

<sup>140</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 6.

<sup>141</sup> *The Economist*, “Hitting the brakes”, January 1<sup>st</sup> 2011, p. 34.

<sup>142</sup> “Car registration in Beijing has increased to 4.8 million from 2.8 million since 2005, with 700,000 new cars registered in the last year alone. The boom has created massive traffic problems in China's capital. The Chinese government now limits the number of new license plates in Beijing to 240,000 awarded annually through the lottery system.” (Jerry Hirsch, “GM's China sales top U.S. total, a first for the automaker”, Los Angeles Times, January 25, 2011.)

<sup>143</sup> “[GM] vehicle sales in China rose nearly 29 percent last year to 2.4 million, [while] U.S. sales rose just 6 percent to 2.2 million. Toyota Motor Corp., which narrowly beat out GM last year to hold its position as the world's largest auto seller, trails far behind its American rival in China, where the Japanese company sold 846,000 vehicles in 2010.” (Jerry Hirsch, “GM's China sales top U.S. total, a first for the automaker,” *Los Angeles Times*, January 25, 2011.)

sales in the United States.<sup>144</sup> These sales by GM include exports from the United States as well as locally produced vehicles.<sup>145</sup> Ford has also expressed a commitment to further increase exports to China to supplement its Chinese manufacturing operations.<sup>146</sup>

As a “pillar industry,” China’s domestic automotive industry continues to enjoy preferential government support, as well as state-imposed market access barriers to foreign competition. The industry is also engaged in joint venture and technology transfer arrangements with both U.S. companies (Ford and General Motors) and foreign companies (to include Volkswagen, FIAT, and Toyota).<sup>147</sup> Chinese motor vehicle exports to the U.S. remain modest — these low-tech vehicles are mainly exported to developing countries in Africa, Asia, and the Middle East.<sup>148</sup> Chinese auto parts exports to the United States, however, have increased over the last decade.<sup>149</sup> While there is potential for auto export growth to the United States, the Chinese auto market is fragmented and Chinese vehicle exports face concerns about IPR, safety, and quality.<sup>150</sup>

#### **Controversies Regarding Currency Valuation as a Factor in the U.S.-China Trade Imbalance**

The impact of the valuation of the Chinese currency (the *Renminbi*, or RMB) is another widely discussed factor affecting the U.S.-China trade balance. According to the *2010 Annual Report to Congress* of the United States Economic and Security Review Commission,

*China’s deliberately undervalued RMB has unfairly conferred substantial economic advantages on China to the detriment of major trading partners, principally the United States and Europe.*

<sup>144</sup> “GM sold more cars and trucks in China than it did in the U.S. last year, marking the first time that a foreign market has outpaced the automaker's domestic sales in its 102-year history. ‘This is the wave of the future,’ said George Magliano, an economist at IHS Automotive. ‘The Chinese market is going to grow faster than the U.S., and it will continue to be this way.’” (Jerry Hirsch, “GM's China sales top U.S. total, a first for the automaker”, Los Angeles Times, January 25, 2011.)

<sup>145</sup> For example, “GM said [January 22, 2011] that it had signed a two-year agreement worth \$900 million to export Cadillac, Buick and Chevrolet vehicles and components to China.” (Jerry Hirsch, “GM's China sales top U.S. total, a first for the automaker”, Los Angeles Times, January 25, 2011.)

<sup>146</sup> “A senior Ford Motor Co. executive said [on Friday, January 21, 2011] that the auto maker is in preliminary talks with Chinese authorities about exporting more North American-built vehicles to China's fast-growing domestic market... Ford on Friday signed an agreement with China's Ministry of Commerce as a first step in the planned export push... Last year, Ford sold 530,000 vehicles in China, a 40 percent increase over 2009. Most of the vehicles were assembled in domestic plants. ‘We're looking to complement our Chinese vehicles with vehicles from the U.S.,’ Mr. Biegun [vice president of International Governmental Affairs for Ford Motor Company] said.” (Rob Tita, “Ford Aims to Export More to China”, *The Wall Street Journal*, January 21, 2011.)

<sup>147</sup> Chang'an Ford Automobile Co., Ltd. is the joint venture between Ford Motors and China’s Chang’an Automobile (Group), and Shanghai General Motors Company Ltd. is the joint venture between General Motors and China’s Shanghai Automotive Industry Corporation (SAIC).

<sup>148</sup> Rachel Tang, “The Rise of China’s Auto Industry and Its Impact on the U.S. Motor Vehicle Industry”, *Congressional Research Service*, November 16, 2009.

<sup>149</sup> Rachel Tang, “The Rise of China’s Auto Industry and Its Impact on the U.S. Motor Vehicle Industry”, *Congressional Research Service*, November 16, 2009.

<sup>150</sup> *Ibid.*

*China's undervalued RMB makes China's exports cheaper and imports more expensive, and it encourages foreign direct investment into China, resulting in the loss of investment and jobs in Europe and the United States...China's management of its exchange rate regime is a major contributing factor to the U.S. trade deficit with China. The undervaluation of the RMB effectively subsidizes all Chinese exports and places a de facto tariff on all Chinese imports and also incentivizes U.S. companies to outsource production to China.*<sup>151</sup>

The USCC is not alone in these conclusions. U.S. Federal Reserve Chairman Ben Bernanke has claimed that the Chinese government's manipulation of its currency effectively subsidizes China's exports.<sup>152</sup> The president of the Peterson Institute of International Economics, Fred Bergsten, has called RMB undervaluation "a blatant form of protectionism . . . which subsidizes all Chinese exports 25 to 40 percent [and] places the equivalent of a 25 to 40 percent tariff on all Chinese imports."<sup>153</sup> According to a research paper released by the Peterson Institute in August 2010, "a 10 percent real effective appreciation of the RMB would lead to a reduction in the U.S. current account deficit of between \$22 billion and \$63 billion per year..."<sup>154</sup> Central bank governors from other countries, like India and Brazil, have also criticized the RMB's undervaluation.<sup>155</sup>

However, not all analysts agree that *renminbi* undervaluation plays a pivotal role in the U.S.-China trade deficit. For example, while conceding that many economists agree the *renminbi* is undervalued, Daniel Ikenson of the Cato Institute asks the question, "Will *renminbi* appreciation have the intended effect of reducing the bilateral trade deficit?" His conclusion is that "[t]he empirical evidence says it won't."<sup>156</sup> The central thesis of his argument is that:

*On the import side, the evidence is not compelling that an appreciating renminbi deters U.S. consumption of Chinese goods. As the renminbi was growing stronger between 2005 and 2008, U.S. imports from China increased by \$94.3 billion, or 38.7 percent. Not only did Americans demonstrate strong price inelasticity, but they actually increased their purchases of Chinese imports, in seeming defiance of the law of demand. One reason for continued U.S. consumption of Chinese goods despite the relative price increase may be that there is a shortage of substitutes for Chinese-made goods in the U.S. market. In some cases, there*

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<sup>151</sup> U.S.-China Economic and Security Review Commission, *2010 Report to Congress* (Washington, D.C.: November 2010), pp. 21 and 28.

<sup>152</sup> Doug Palmer and Lucia Mutikani, "China Yuan a Subsidy, Needs to Rise—Bernanke," Reuters, July 21, 2010, cited by U.S.-China Economic and Security Review Commission, *2010 Report to Congress* (Washington, D.C.: November 2010), p. 21.

<sup>153</sup> C. Fred Bergsten, "Beijing is Key to Creating More U.S. Jobs," *Foreign Policy*, April 14, 2010, cited by U.S.-China Economic and Security Review Commission, *2010 Report to Congress* (Washington, D.C.: November 2010), p. 21.

<sup>154</sup> U.S.-China Economic and Security Review Commission, *2010 Report to Congress* (Washington, D.C.: November 2010), p. 29; see William Cline, "Renminbi Undervaluation, China's Surplus, and the US Trade Deficit", Peterson Institute for International Economics, August 2010.

<sup>155</sup> Geoff Dyer, "China Under Growing Currency Pressure," *Financial Times*, April 21, 2010, cited by U.S.-China Economic and Security Review Commission, *2010 Report to Congress* (Washington, D.C.: November 2010), p. 21.

<sup>156</sup> Daniel J. Ikenson, "China and Currency Valuation", *National Review (Online)*, March 17, 2010.

are no domestically produced alternatives at all. Accordingly, U.S. consumers were faced with the choice of purchasing higher-priced items from China or forgoing consumption of an item altogether."<sup>157</sup>

In May 2010, a delegation of senior U.S. executives representing the American Chamber of Commerce in Beijing claimed that *renminbi* appreciation is not likely to shrink the trade balance.<sup>158</sup> Rather, they argue that China's industrial policy is supported by other, more troubling "market-distorting tactics."<sup>159</sup> At the top of this list are demands that U.S. and other foreign firms provide technology in exchange for Chinese market access.<sup>160</sup> According to a member of the delegation, "The Chinese government is more than happy to keep the focus on the currency because it's not the real problem."<sup>161</sup>

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<sup>157</sup> Daniel J. Ikenson, "China and Currency Valuation", *National Review (Online)*, March 17, 2010.

<sup>158</sup> "U.S. officials, senators and some economists have predicted that if China allows the value of the yuan to rise, it will mean a smaller trade deficit with China, more American exports and more jobs for American workers. Fat chance on both counts, according to the American Chamber delegation... For one, the stuff China sells us has been imported by the United States from other countries for decades. So if we don't buy it from China, we'll buy it from someone else. Take TVs. Twenty years ago, they all said "Made in Japan" on the back. Now they say "Made in China." If China allows the yuan to appreciate, it's not like TV manufacturing is going to move back to the United States and RCA Victor will rise anew. Americans will just buy them from someplace else." (John Pomfret, "China's industrial policy is bigger concern than yuan, U.S. executives say", *The Washington Post*, May 7, 2010.)

<sup>159</sup> "China's bureaucrats have been rolling out an array of interlocking regulations and state spending aimed at making their country a global technology powerhouse by 2020. The new initiatives—shaped by rising nationalism and a belief that foreign companies unfairly dominate key technologies—range from big investments in national industries to patent laws that favor Chinese companies and mandates that essentially require foreign companies to transfer technology to China if they hope to sell in that market.. 'It's a huge, long-term strategic issue,' says a top executive at a U.S. technology firm operating in China. "It isn't just the crisis of the day for U.S. business. It's the crisis." Deluged by complaints from companies, the U.S. Chamber of Commerce... commissioned a report to measure the scope of China's actions. It found what it calls... an 'intricate web' of new rules 'considered by many international technology companies to be a blueprint for technology theft on a scale the world has never seen before.'" (John Bussey, "U.S. Firms, China Are Locked in Major War Over Technology", *The Wall Street Journal*, February 2, 2011.)

<sup>160</sup> "An example? China used to import close to 100 percent of its wind-power turbines. Now it makes close to 75 percent of those that are sold in China. Chinese firms haven't developed wind-turbine technology; they've just required that foreign firms selling turbines in China share that technology, and now their firms manufacture the turbines at a lower cost." (John Pomfret, "China's industrial policy is bigger concern than yuan, U.S. executives say", *The Washington Post*, May 7, 2010.)

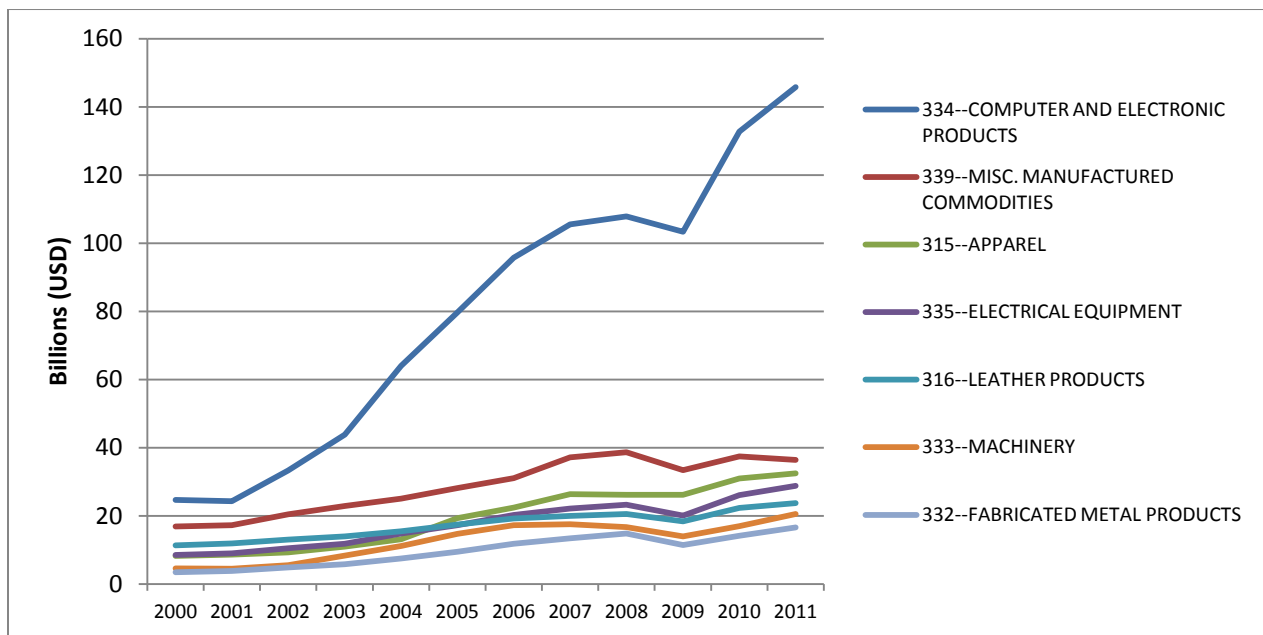
<sup>161</sup> John Pomfret, "China's industrial policy is bigger concern than yuan, U.S. executives say", *The Washington Post*, May 7, 2010.

## Imports

Imports from China into the United States have risen from \$100 billion in 2000 to \$399 billion 2011. The top import categories have stayed fairly constant from 2000 to 2011: computer and electronic products, miscellaneous manufactured commodities, apparel, electrical equipment, leather goods, machinery and fabricated metal products. These are all manufacturing categories that gain competitive advantage from low labor prices in China.

In the past, Chinese exports to the United States have traditionally been low-value, labor intensive products such as toys and games, footwear, textiles and apparel. However, since China entered the WTO, an increasing proportion of U.S. imports from China have been comprised of more technologically advanced products.<sup>162</sup> Reflecting this trend, by far the largest growth sector in Chinese exports to the U.S. market has been computer and electronic products, increasing nearly six-fold from around \$24.7 billion in 2000 to nearly \$145.8 billion in 2011 (see Figure 19).

***Figure 19: Imports (Top Imports), China to U.S. (2000-2011, NAIC, 3-digit)***



Looking at the top Chinese exports to the United States for the period from 2000 to 2010 (see Appendix 2), the placement and variety of technologically advanced products has increased significantly. The top category of Chinese imports to the United States between 2000 and 2011 has consistently been automatic data processing machines (a category that includes computers). However, the #2 import

<sup>162</sup> "According to the U.S. Census Bureau, U.S. imports of advanced technology products (ATP) from China in 2009 totaled \$89.7 billion. ATP products accounted for 30.3 percent of total U.S. imports from China, compared with 19.2 percent (\$29.3 billion) in 2003. In addition, China in 2009 accounted for 29.8 percent of total U.S. ATP imports, compared with 14.1 percent in 2003." (Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 7).

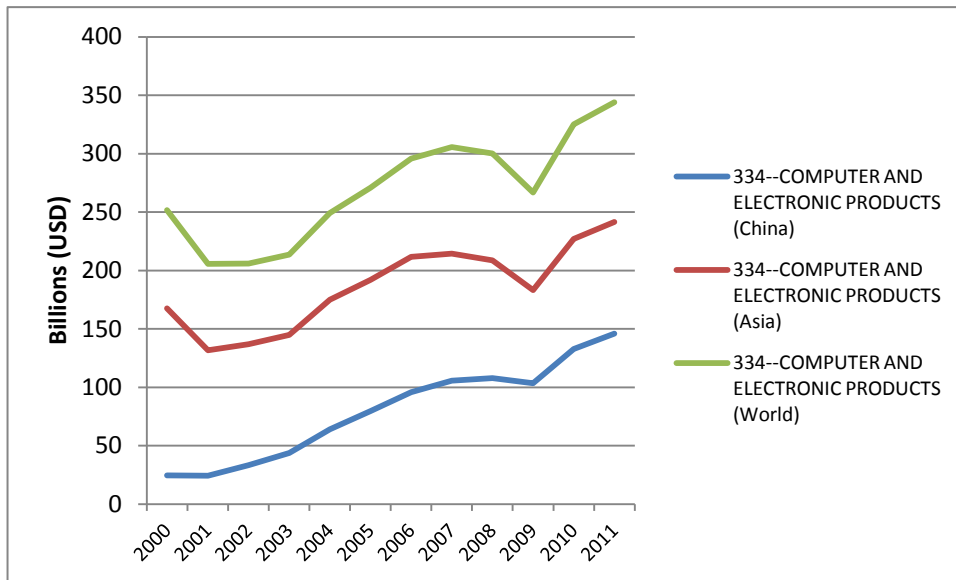


category in 2011, electric apparatus for line telephony (a category that includes telephones, video phones and fax machines) was the #9 import category in 2000. The #3 import category in 2011, television receivers (including video monitors), was not a top 10 import in 2000. The #4 import category in 2011, toys (including video games), was also not on the list of top 10 imports in 2000. The #6 import in 2011, printers, again was not on the list of top 10 import categories in 2000. Note that while these items are classified as technologically advanced products for purposes of trade data, they are still by and large relatively low-tech consumer electronics.

**Computers and Electronics**

A portion of this growth may merely be the reallocation of computer and electronics imports from other parts of Asia to China. Comparing imports of computer and electronic products from China into the United States against imports of computer and electronic products from both Asia and the World from 2000 to 2011 (see Figure 22), exports from China have risen by around \$121 billion (from \$25 billion in 2000 to \$145.8 billion in 2011), while exports from the entire world have only risen by about \$92 billion and exports from Asia only by about \$74 billion.

***Figure 20: Imports (Computers and Electronics),  
World, Asia and China to U.S. (2000-2011, NAICS 3-digit)***



This boom in electronics and computers imports from China to the United States may also in part reflect the trends of non-Chinese manufacturers to increasingly locate their product assembly facilities within China, as the final segment of a global production network.<sup>163</sup> Consider, for example, the following statement from a recent Congressional Research Service report:

<sup>163</sup> “Over the past few decades, many multinational firms have integrated China into their global production networks by moving labor-intensive processing plants to the country for export purposes. It is often neglected, however, that these processing plants heavily rely on imported inputs for their exports, while only a relatively

*[W]hile U.S. imports of computer equipment from China from 2000-2009 rose by 440 percent, the total value of U.S. computer imports worldwide rose by only 14 percent. Many analysts contend that a large share of the increase in Chinese computer production and exports has come from foreign computer companies that have moved manufacturing facilities to China. For example, Taiwan, one of the world's leaders in sales of information technology, produces over 90 percent of its information hardware equipment (such as computers) in China.<sup>164</sup>*

Many Taiwanese companies have shifted production to China. In addition to well-known Hai Precision Industry – producer of products like Apple's iPad and Motorola cell phones – this includes companies like laptop computer producers Quanta Computer, Compal Electronics, Wistron, and Inventec Technology. These companies serve as contract designers and manufacturers for such non-Chinese brands as Hewlett-Packard, Dell and Acer.<sup>165</sup> That is to say, the increase in electronics and computer imports from China from 2000 to 2011 is not necessarily indicative of any newfound dominance in these categories by Chinese corporations or Chinese brands.

According to economist Sylvain Plasschaert, “a major part (around 60 percent of the exports out of China) is operated by ‘foreign-invested enterprises’. This concept comprises both joint ventures between Chinese and foreign companies, and fully-owned affiliates of foreign enterprises as well. In other words, the label ‘Made in China’ is not synonymous with ‘made by Chinese firms proper’.”<sup>166</sup> The percentage of electronics and computer production operated by “foreign-invested enterprises” in China is likely even higher than this 60 percent.<sup>167</sup> As Dr. Theodore Moran noted in written testimony before the U.S.-China Economic and Security Review Commission on March 30, 2011:

*Foreign manufacturing investors have been responsible for more than 92 percent of all Chinese ATP [Advanced Technology Products] exports since 1996, and 96 percent since 2002. And within this 96 percent foreign investor-dominated channel, there has been a shift to wholly-owned MNC exporters from joint venture companies. State-owned Chinese enterprises have an ATP trade deficit with the US, while private Chinese firms and collective enterprises contribute very little to ATP trade.<sup>168</sup>*

If the massive increase in imports of electronics and computers from China to the United States over the past decade is reflective of imports by MNCs (whose products are sourced globally but assembled in China), this has strong implications for the gains from these imports by both Chinese firms and the

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small portion of the export value is produced in China. In the media and even in academic and policy circles, this has led to important misinterpretations of China's role in the world economy.” (Alyson C. Ma, Ari Van Assche, “China's Role in Global Production Networks”, p. 19).

<sup>164</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, January 2011, p. 8.

<sup>165</sup> U.S. Taiwan Business Council, “Semiconductor Report: Annual Review 2010”, p. 7.

<sup>166</sup> Sylvain Plasschaert, “Is the Renminbi Undervalued? The myths of China's trade surplus and global imbalances”, Ecipe Working Paper, No. 02/2011.

<sup>167</sup> “Processing exports [i.e. exports made using duty-exempt imported inputs] are more important in higher technology categories than in lower technology categories. In 2007, processing exports accounted for 84.9% of high-technology exports; 45.6% of medium-high-technology exports; 26.6% of medium-low-technology exports; and 29.8% of low-technology exports.” (Alyson C. Ma, Ari Van Assche, “China's Role in Global Production Networks”, p. 4).

<sup>168</sup> U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H. Moran, March 30, 2011.

Chinese government.<sup>169</sup> For many Chinese electronic and computer imports into the United States, the actual Chinese contribution to the overall value chain is quite low (essentially only the added value from assembly), even though the entire value of such imports into the United States are then attributed to China. According to Dr. Moran:

*The share of domestic value-added FDI operation in China in high skill-intensive sectors such as computers and telecommunications ranges from less than one-half to slightly more than one-half of what is found in other developing countries where comparable measures can be made, such as Mexico... the production of increasingly sophisticated goods destined for international markets from China has been remarkably well constrained to and contained within the plants owned and controlled by foreign multinationals and their international suppliers.*<sup>170</sup>

*At the end of the day, China's high tech export explosion represents multinational corporations bringing high skill-content high value-added inputs into China, assembling them into final products (or semi-assembled intermediaries), and exporting them to world markets.*<sup>171</sup>

Based upon the limited value added by Chinese firms in Chinese high-tech exports, Alyson C. Ma and Ari Van Assche have argued that, "once China's role in global production networks is taken into account, there is little evidence that China is rapidly moving up the technology ladder and becoming competitive in technology-intensive areas... Rather, China's production activities have remained consistent with its comparative advantage in labor-intensive production activities."<sup>172</sup>

#### **Outsourcing: "Win-Win" or Hollowing Out the U.S. Manufacturing Sector?**

If U.S. corporations are manufacturing computers and electronics via networks of global (largely Asian) supply chains and then repatriating a large share of profits, this should *prima facie* benefit both U.S. companies and consumers and be a "win-win" situation. According to Wayne Morrison of the Congressional Research Service, "U.S. imports of low-cost goods from China greatly benefit U.S. consumers by increasing their purchasing power. U.S. firms that use China as the final point of assembly for their products, or use Chinese-made inputs for production in the United States, are able to lower costs and become more globally competitive."<sup>173</sup>

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<sup>169</sup> "In the mid-eighties, the Chinese government put [a] customs regime into place to entice foreign firms to offshore their production activities to China. Under this regime, firms located in China are granted duty exemptions on imported raw materials and other inputs as long as they are used solely for export purposes. Since its installment, processing exports has rapidly expanded to more than half of China's overall exports." (Alyson C. Ma, Ari Van Assche, "China's Role in Global Production Networks", p. 2). While this regime may have enticed foreign investment, it has also likely reduced government revenue from this investment, as this means that potentially significant portions of assembled exports are made using tax-free inputs.

<sup>170</sup> U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H, Moran, March 30, 2011.

<sup>171</sup> U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H, Moran, March 30, 2011.

<sup>172</sup> Alyson C. Ma and Ari Van Assche, "China's Role in Global Production Networks", p. 15

<sup>173</sup> Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Washington, DC, May 6, 2011, Summary.

Becoming more globally competitive allows these firms to increase profits and/or market share, and should facilitate the hiring of more employees, both in the U.S. and abroad. Daniel J. Ikenson of the Cato Institute illustrates the potential for high-wage job creation in the United States by outsourcing low-value assembly tasks to China as follows:

*According to a widely cited 2007 study by Greg Linden, Kenneth L. Kraemer and Jason Dedrick of the University of California, Irvine, each Apple iPod costs \$150 to produce. But only about \$4 of that cost is Chinese value-added. Most of the value comes from components made in other countries, including the U.S. Yet when those iPods are imported from China, where they are snapped together, the full \$150 is counted as an import from China... In reality, those imported iPods support thousands of U.S. jobs up the value chain — in engineering, design, finance, manufacturing, marketing, distribution, retail and elsewhere.*<sup>174</sup>

The 2007 study by Greg Linden, *et al* seems to confirm Ikenson's claim:

*To summarize, the iPod supports nearly twice as many [mainly production] jobs offshore as in the U.S., yet wages paid in the U.S. are over twice as much as those paid overseas. Apple keeps most of its R&D, marketing, top management and corporate support functions in the U.S., creating over 5,800 professional and engineering jobs that can be attributed to the success of the iPod. The iPod also supports thousands of U.S. non-professional jobs, mostly in retail...*<sup>175</sup>

However, some analysts warn that even this scenario – in which only low-value tasks are outsourced to China and high-value tasks are kept in the United States and other parts of Asia, such as Japan – could have a negative long-term impact upon the U.S. economy, based on the fact that large-scale outsourcing of manufacturing activities might lead to a hollowing out of America's industrial base. According to Greg Linden's report:

*As recently as 2000, over one-third of the jobs in the U.S. computer industry were production jobs. By 2007, the number of production workers had fall to less than one sixth of total employment, and total production jobs had been cut in half just since 2002.*<sup>176</sup>

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<sup>174</sup> Daniel Ikenson, "China Trade and American Jobs", Cato Institute, April 2, 2010. According to Dr. Moran, a similar study of Apple's iPhone conducted in 2010 by Yuqing Xing and Neal Detert" found that the value-added in China for the iPhone was \$6.50 per unitm which was 3.6 percent of the total shipping price of the phone." (U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H, Moran, March 30, 2011.) Supporting Ikenson's statement about the creation of U.S. jobs, Dr. Moran also notes that "US-headquartered MNCs have 70 percent of their operations, make 89 percent of their purchases, spend 87 percent of their R&D dollars, and locate more than half of their workforce within the US economy.... Thus, while manufacturing MNCs may build plants in China... the largest impact from deployment of worldwide earnings is to bolster their operations in their home markets." (U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H, Moran, March 30, 2011.)

<sup>175</sup> Greg Linden, Jason Dedrick and Kenneth Kraemer, "Innovation and Job Creation in a Global Economy: The Case of Apple's iPod", *Personal Computing Industry Center*, January 2009, p.3.

This means that American workers are losing basic skills. As Clyde Prestowitz writes:

*Over the past ten years there has been a massive loss of 8 million manufacturing jobs [in America]. That has been accompanied by substantial job creation in the services industries, but the bulk of the new jobs are in retailing and food service, which pay far less with far fewer benefits than manufacturing... China's workers today are not on average as well educated as U.S. workers. But the jobs are moving to China because the corporations can up-skill them on the line and make them highly productive. By the same token, just because the jobs are moving to China or elsewhere, American workers are to a certain extent being down-skilled as they move to more menial work in retailing or food service.*<sup>177</sup>

Moreover, there is no guarantee that future job losses will be limited to low-wage production positions. Linden's report warns:

*Many U.S. high-tech companies are [already] investing in white-collar job creation offshore to tap pools of low-cost talent and gain access to growing markets... What is not known is whether innovative U.S. companies will continue to keep white-collar jobs in the U.S. while outsourcing production overseas... if globalization leads to a hollowing out of professional jobs as well as manufacturing, then innovation will only benefit shareholders, consumers, and a small number of top managers and professionals in the U.S.*<sup>178</sup>

In addition to human resources, the large scale outsourcing of consumer electronics has also cost America associated infrastructure and a base of suppliers. According to Gary Pisano of Harvard Business School, this means that even if wages in China explode in the future, the shift in operations to low-wage countries like China has already become "almost irreversible."<sup>179</sup>

However, according to Andy Grove, chief executive officer or chairman at Intel from 1987 to 2005, the biggest danger of electronics outsourcing to China is to future innovation. As the "scaling process" (the process by which "technology goes from prototype to mass production") has moved to China, it has future breakthroughs with it. Mr. Grove illustrates the danger of breaking "the chain of experience that is so important in technological evolution" with the example of advanced batteries,

*It has taken years and many false starts, but finally we are about to witness mass-produced electric cars and trucks. They all rely on lithium-ion batteries... [and] the U.S.*

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<sup>176</sup> Greg Linden, Jason Dedrick and Kenneth Kraemer, "Innovation and Job Creation in a Global Economy: The Case of Apple's iPod", *Personal Computing Industry Center*, January 2009, p.4.

<sup>177</sup> Clyde Prestowitz, "Clyde Prestowitz: The Betrayal of American Prosperity (Excerpt)", May 11, 2010, <http://www.progressivereader.com/?p=58997>.

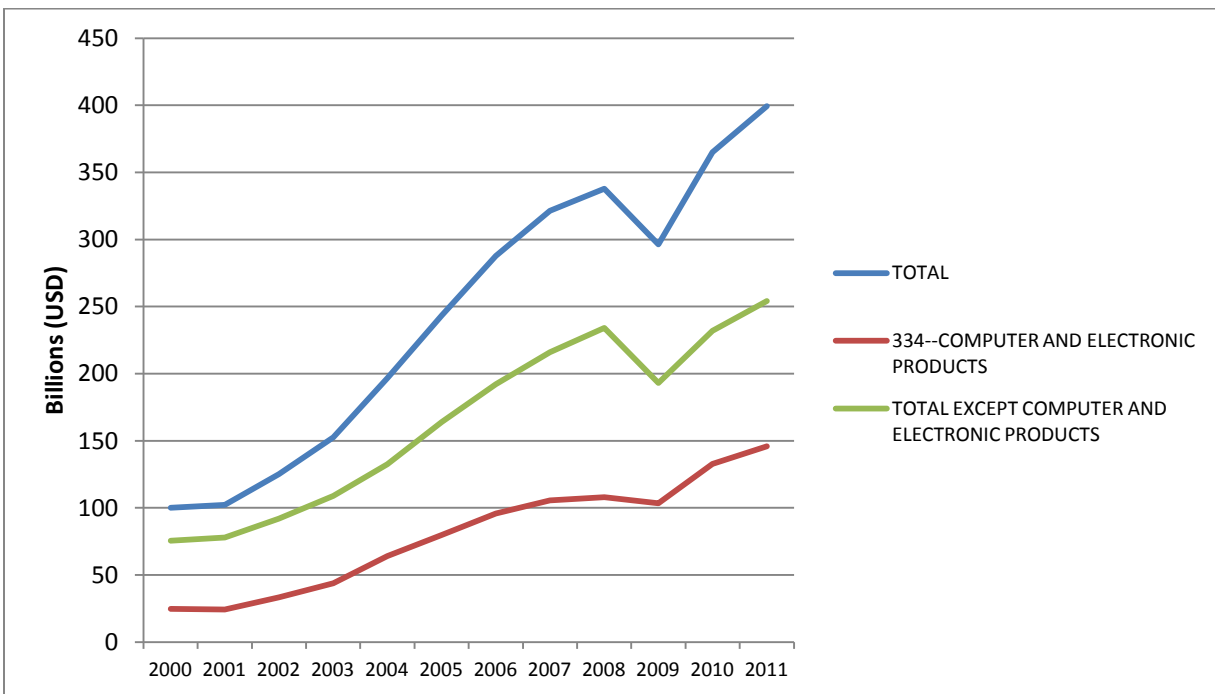
<sup>178</sup> Greg Linden, Jason Dedrick and Kenneth Kraemer, "Innovation and Job Creation in a Global Economy: The Case of Apple's iPod", *Personal Computing Industry Center*, January 2009.

<sup>179</sup> *The Economist*, "Multinational manufacturers Moving back to America", May 14, 2011. See also Gary P. Pisano and Willy S. Shih, "Restoring American Competitiveness", *Harvard Business Review*, July-August 2009.

*share of lithium-ion battery production is tiny... The U.S. lost its lead in batteries 30 years ago when it stopped making consumer electronic devices. Whoever made batteries then gained the exposure and relationships needed to learn to supply batteries for the more demanding laptop PC market, and after that, for the even more demanding automobile market. U.S. companies did not participate in the first phase and consequently were not in the running for all that followed. I doubt they will ever catch up.”<sup>180</sup>*

Solely considering computers and electronics exports from China to the United States presents a skewed understanding of the overall nature of exports from China to the United States from 2000 to 2011. Although computers and electronic products have seen significantly faster growth than any other category from 2000 to 2011, all of the top Chinese export categories have grown during this period. This includes many lower-tech products for which the share of Chinese value-added is considerably higher. (See Figure 21) The total value of computers and electronics exports from China to the United States amounted to more than \$950 billion from 2000 to 2011, but all other exports from 2000 to 2011 amounted to more than \$1.9 trillion. Thus, even if the case of the iPod is not an outlier and computer and electronic products only reflect a very low level of value-added in China, most of the exports from China to the United States during this period still consisted of lower tech products that embody a higher level of value added in China (see Figure 21).

**Figure 21: Imports (Computers and Electronics vs. Other), China to U.S. (2000-2011, NAICS 3-digit)**



<sup>180</sup> Andy Grove, “How America Can Create Jobs”, *Bloomberg Businessweek*, July 1, 2010. For a much more positive account of the role of Chinese R&D in the scaling operations of multi-national corporations and its effect in freeing their resources to focus on higher-value innovation, see Edward Steinfield’s book *Playing Our Game: Why China’s Rise Doesn’t Threaten the West* (Oxford University Press, August 2010),

## Demographic Trends and Their Potential Impact on Future Trade Patterns

While there are concerns in the United States over the size of the bilateral trade deficit with China, there are concerns in China that it cannot continue to grow indefinitely relying upon a model where it is simply the world's workshop. In the short- to medium-term, rising real wages in China,<sup>181</sup> coupled with the specters of inflation and regional labor shortages,<sup>182</sup> threaten to make China a less competitive export economy. While rising labor costs are not anticipated to affect decisions by computers and electronics firms — which are more heavily reliant upon investment in infrastructure and specialized skill sets<sup>183</sup> — for low-value, labor-intensive products higher wages will likely either translate into higher prices for consumers in the United States or into fewer orders for Chinese firms.<sup>184</sup> This trend has already begun to affect the manufacturing decisions of producers of textile goods and footwear, like Coach<sup>185</sup> and Payless Shoes.<sup>186</sup> Such firms may have to increasingly turn to countries other than China to supply them with cheap labor.

<sup>181</sup> “Research by the International Labour Organisation suggests that Chinese wages have been outpacing the rest of Asia for at least a decade. Chinese workers received real wage rises averaging 12.6 per cent a year from 2000 to 2009, compared with 1.5 per cent in Indonesia and zero in Thailand...” (Kevin Brown, “Rising Chinese wages pose relocation risk”, *Financial Times*, February 15, 2011.) “Economists believe that China has hit a point in its development at which demand for labor starts to grow faster than supply, pushing up salaries. A survey conducted by Standard Chartered in the first quarter of 2011 showed average wages in a sample of 87 manufacturing firms rising by 9 percent to 15 percent from the previous year.” (Jason Dean and Tom Orlik, “China Signals Yuan May Be Inflation Tool”, *Wall Street Journal*, April 21, 2011.) “Guangdong Province, the export heartland of light industry next to Hong Kong, announced [in January 2011] that its cities were raising their minimum wages [again] by an average of 18.6 percent, effective March 1...” (Keith Bradsher, “Inflation in China May Limit U.S. Trade Deficit”, *The New York Times*, January 30, 2011.)

<sup>182</sup> “The shortage of migrant workers that gripped the Pearl River Delta region and the coastal areas of Fujian Province in 2003 gradually seeped its way into the Yangtze River Delta region and other coastal provinces. In 2009, this trend extended to several cities in central China.... “Labor shortage” and the upward trend in wages for migrant workers indicate that the transfer of rural surplus labor in China may have reached a turning point, changing from an infinite supply to a finite surplus. A shortage of the young labor force is beginning to emerge.” (Jianmin Li, “China's Looming Labor Supply Challenge?”, *The Jamestown Foundation, China Brief Volume: 11 Issue: 6*, April 8, 2011.)

<sup>183</sup> “...manufacturing experts doubt that many high-tech companies are planning to abandon China – not least because many rely on suppliers who have co-located in southern China’s vast technology clusters specifically to be near their customers. Bhavtosh Vajpayee, head of technology research at CLSA in Hong Kong, says: “It is not possible for these high-tech companies to shift much of their production to Asean countries; they just don’t have the skills and the infrastructure that is needed. It just cannot be done.” (Kevin Brown, “Rising Chinese wages pose relocation risk”, *Financial Times*, February 15, 2011.)

<sup>184</sup> “The higher Chinese prices will tend to show up mainly in products like inexpensive clothing and other commodity goods in which labor and raw materials represent a bigger part of the final value — rather than in sophisticated electronics like Apple iPads, in which Chinese assembly is only a small fraction of the cost.” (Keith Bradsher, “Inflation in China May Limit U.S. Trade Deficit”, *The New York Times*, January 30, 2011.)

<sup>185</sup> “Coach, the American company that is one of the largest marketers of luxury handbags and other accessories, announced on Tuesday that it planned to reduce its reliance on China to less than half of its products, from more than 80 percent now. It will shift output to Vietnam and India, particularly for smaller, more labor-intensive leather goods”, though this will likely take about 4 years according to the company’s executive vice president and chief financial officer. (Keith Bradsher, “Inflation in China May Limit U.S. Trade Deficit”, *The New York Times*, January 30, 2011.) See also John Gapper and Barney Jopson, “Coach to shift manufacturing from China”, *Financial Times*, May 12, 2011

<sup>186</sup> “Matt Rubel, chief executive of Collective Brands, the US footwear group that owns the Payless shoe stores chain, is shifting a chunk of production from China to Indonesia, south-east Asia’s largest economy. ‘The utopia for

In the long-term, a rapidly aging population and the effects of China's "one child" policy are likely to exacerbate pressures upon China's low-income labor market. Whereas China's working age population (age 15 to 64) accounted for over 71 percent of China's total population in 2010,<sup>187</sup> this number is likely to drop in coming years.

Most importantly from the perspective of low-wage labor, there will be a "precipitous drop" in workers in their 20s. According to Feng Wang of the Brookings-Tsinghua Center,

*[B]etween 2016 and 2026, the size of the population in this age range will be reduced by about one-quarter, to 150 million from 200 million. For Chinese aged 20 to 24, that decline will come sooner and will be more drastic: Over the next decade, their number will be reduced by nearly 50 percent, to 68 million from 125 million. Such a drastic decline in the young labor force will usher in, for the first time in recent Chinese history, successive shrinking cohorts of labor force entrants... as a result of China's very low fertility over the past two decades, the abundance of young, inexpensive labor is soon to be history...*<sup>188</sup>

As a result, according to Jianmin Li of The Jamestown Foundation, "The comparative advantage of cheap labor, on which China's economic growth and international competitive power rely on, will gradually be weakened or even lost, severely straining the vigor of economic development. Under these circumstances, the traditional labor-intensive industries will face enormous pressure."<sup>189</sup>

Loss of competitiveness in labor-intensive, low-margin exports means that high-technology products will likely continue making up an increasing share of Chinese imports to the United States. Perhaps in part because of the increasing difficulty of operating primarily as an export-based assembly hub, China has been looking to expand into higher value added exports of products made using Chinese-owned technology rather than continuing to just add a small portion of the value of high-tech products through assembly. As the U.S. International Trade Commission puts it, "In a nutshell, China would like to shift from 'made in China' to 'created in China.'"<sup>190</sup>

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one stop sourcing for quality and low price has been China . . . but utopias never last,' says Mr Rubel." (Kevin Brown, "Rising Chinese wages pose relocation risk", *Financial Times*, February 15, 2011.)

<sup>187</sup> Jianmin Li, "China's Looming Labor Supply Challenge?", The Jamestown Foundation, China Brief Volume: 11 Issue: 6, April 8, 2011.

<sup>188</sup> Feng Wang, "China's Population Destiny: The Looming Crisis", Brookings, September 2010.

<sup>189</sup> Jianmin Li, "China's Looming Labor Supply Challenge?", The Jamestown Foundation, China Brief Volume: 11 Issue: 6, April 8, 2011.

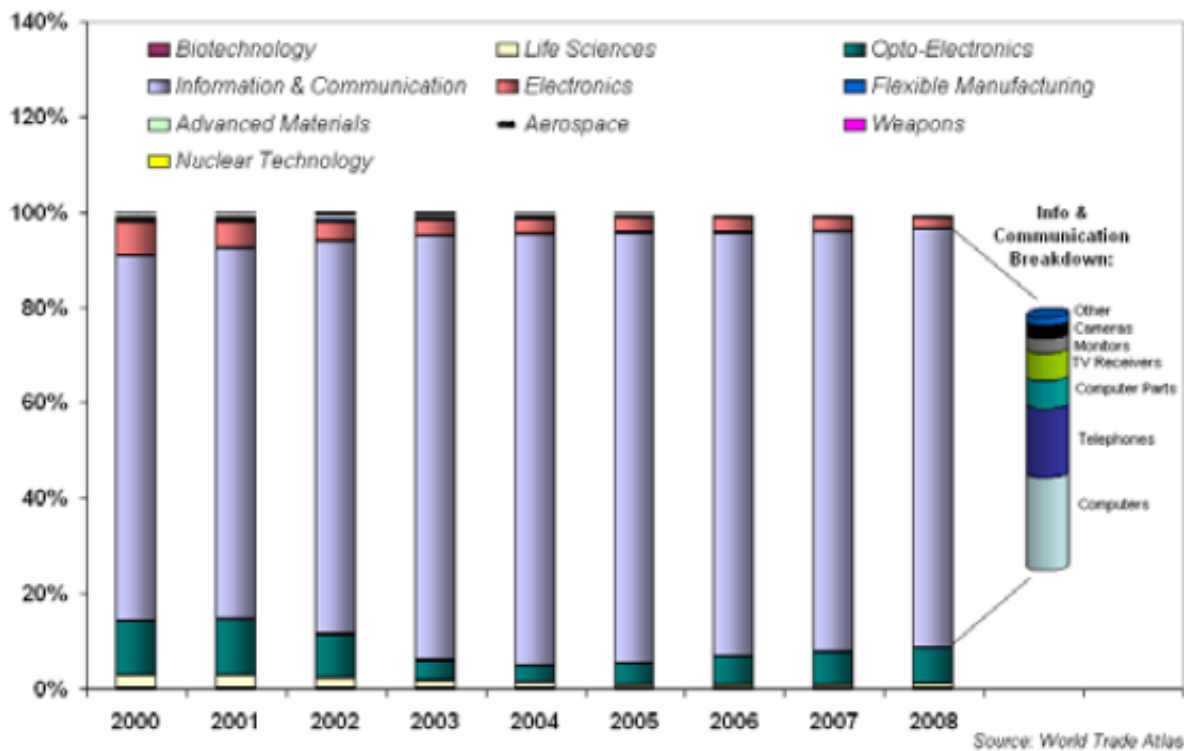
<sup>190</sup> U.S. International Trade Commission, "China: Intellectual Property Infringement, Indigenous Innovation Policies, and Frameworks for Measuring the Effects on the U.S. Economy", November 2010, p.1-2.



**The Trade Deficit in Advanced Technology Products (ATP)**

Chinese advanced technology products (ATPs) are defined by the U.S. Census Bureau as high-technology products, encompassing a range from biotechnology and information and communications to aerospace, weapons, and nuclear technology.<sup>191</sup> U.S. ATP exports to China have steadily grown over the last decade, contributing to a widening trade imbalance. As Figure 24 shows, the main concentration of the ATPs imported from China in the last decade were information and communication products (comprising computers and computer parts, televisions, telephones, cameras, and monitors).<sup>192</sup> As the USCC’s 2010 Annual Report noted, the U.S.-China ATP trade deficit has continued to expand in recent years, reaching \$109 billion in 2011.<sup>193</sup>

**Figure 22: U.S. ATP Imports from China (2000 – 2008)**

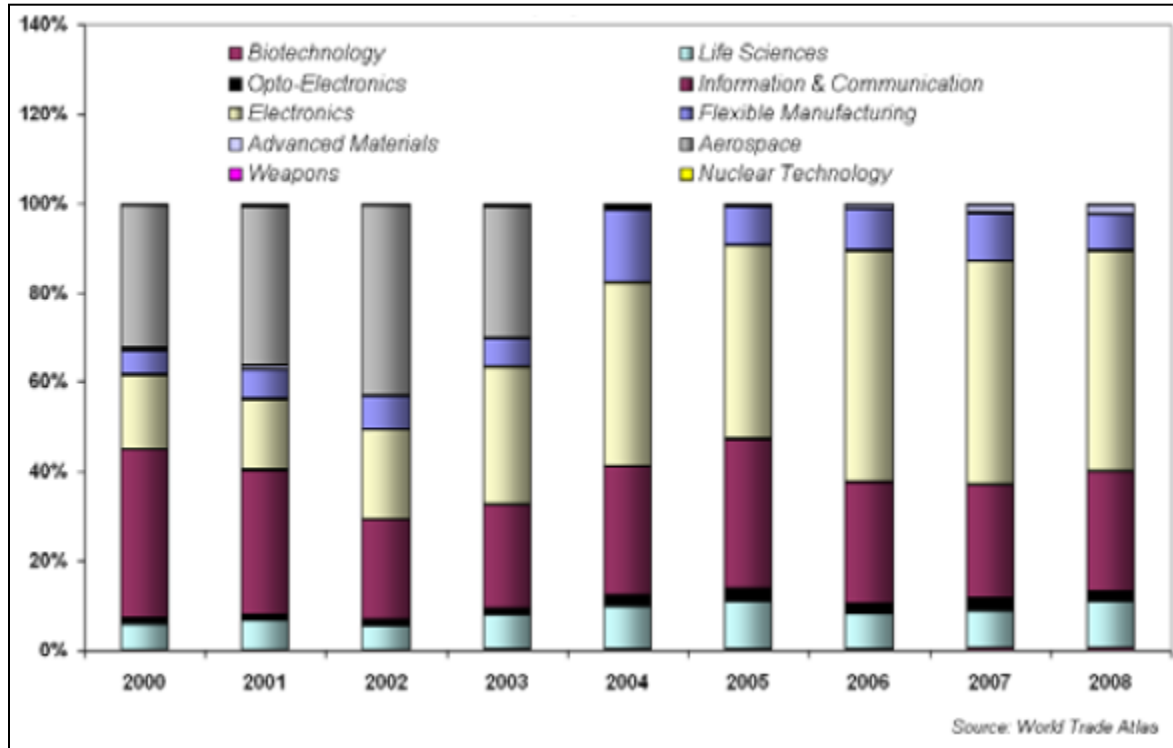


<sup>191</sup> U.S. Census Bureau, “Advanced Technology Product Definitions” (Washington, DC: U.S. Department of Commerce, July 12, 2011), <http://www.census.gov/foreign-trade/reference/glossary/a/atp.html>.

<sup>192</sup> Alexander Hammer, Robert Koopman, and Andrew Martinez, “China’s Exports of Advanced Technology Products to the United States”, U.S. International Trade Commission, October 2009.

<sup>193</sup> U.S. Census Bureau, “U.S. International Trade in Goods and Services” [http://www.census.gov/foreign-trade/Press-Release/current\\_press\\_release/exh16a.pdf](http://www.census.gov/foreign-trade/Press-Release/current_press_release/exh16a.pdf).

**Figure 23: U.S. ATP Exports to China (2000 – 2008)**



Some analysts have pointed out, however, that a widening U.S. ATP trade deficit does not necessarily indicate Chinese dominance. There is great variety and use of ATPs, with the majority of Chinese exports to the U.S. being classified in the lower-tech information and communication category, while U.S. ATPs exports to China include semiconductors and more high-tech products.<sup>194</sup> Figure 23 shows that U.S. exports to China mainly consist of nuclear technology, information and communication, aerospace, and advanced materials.<sup>195</sup> Hence, the trade imbalance notwithstanding, there is still a sizeable gap in technology and quality between U.S. and Chinese ATP exports.

<sup>194</sup> Elliot Musilek, "A Closer Look At U.S.-China Trade in Advanced Technology Products", Center for Strategic and International Studies, August 18, 2010.

<sup>195</sup> Alexander Hammer, Robert Koopman, and Andrew Martinez, "U.S. Exports of Advanced Technology Products to China", U.S. International Trade Commission, October 2009.

## Conclusions

Although U.S. exports to China have increased substantially since China entered the WTO in 2001, the overall value of these exports has failed to keep pace with the concurrent surge in imports from China. This has resulted in a huge and growing trade deficit between the United States and the People's Republic of China. The most obvious change in U.S. exports to China in 2011 versus 2000 is the dramatic rise in levels of non-manufactured goods. This includes both agricultural products to feed China's increasingly affluent and urbanizing population, and raw materials to feed China's growing industrial needs.<sup>196</sup> Whereas in 2000 the United States had a trade deficit with China in non-manufactured goods of around \$283 million, by 2011 that had become a trade surplus of nearly \$19.7 billion.

While the total value of manufactured exports from the United States to China rose more than six-fold from 2000 to 2011, much of this growth came in the form of intermediate goods rather than final goods: For example, computer components (like semi-conductors) rather than notebook computers, and basic chemicals (such as plastics used to make bags for packaging) rather than pharmaceuticals. The most notable exception to this pattern has been found in transportation equipment – primarily airplanes and automobiles – where, at least for the short- to medium- term, U.S. exports to China should remain strong. Sales of these sorts of transportation equipment may reflect a demand in China for higher tech items that China does not produce itself.<sup>197</sup> Possibly also reflecting this disparity in technological sophistication, there remains a “sizable technological gap between Chinese ATP imports [from the United States] and Chinese ATP exports [to the United States].”<sup>198</sup>

The most prominent change in U.S. imports from China in 2010 versus 2011 is a steady move up the value chain for products coming out of China. While the bulk of China's exports to the United States still reflect China's lower labor costs, an increasing share and quantity of these exports are in higher tech products – most notably, computers and electronics. Over the past decade, this may not have been indicative of a general movement by Chinese firms up the technological ladder— rather, it is possible that China has come to mainly serve as an assembly and export platform for foreign corporations, which took components manufactured elsewhere in world and put them together in China. Most recently, national champions like Lenovo, Huawei and Haier have begun to buck this trend, producing and exporting computers and consumer electronics with both high-value added in China and Chinese brand names. If China's efforts to spark “indigenous innovation” are successful (as it appears they already

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<sup>196</sup> For an account of China's “dramatic, unexpected, and unplanned reversion toward heavy industrial production” starting in 2002, see Matthew Ferchen, “China–Latin America Relations: Long-term Boon or Short-term Boom?”, *The Chinese Journal of International Politics*, Vol. 4, 2011, pp. 75, 79-81.

<sup>197</sup> Another major Chinese import which has not been examined in this report is machinery, much of which (especially high-end machinery) China imports from Germany's *Mittelstand*. While machinery is also a top manufactured export from the U.S. to China, the U.S. has an overall trade deficit with China in terms of machinery. (See Figure 12) U.S. machinery exports to China jumped from around \$6.5 billion in 2009 to \$9.3 billion in 2010.

<sup>198</sup> U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-Owned Enterprises and U.S.-China Bilateral Investment*, testimony of Dr. Theodore H. Moran, March 30, 2011.

might be in green energy technologies<sup>199</sup>, where Chinese companies have recently emerged as global leaders in wind<sup>200</sup> and solar power<sup>201</sup>), such national champions may be a sign of serious changes to come in the U.S.-China trade relationship.

The move “down” the value chain observed in U.S. exports to China, and the concurrent move “up” the value chain seen in Chinese exports to the United States, is connected. As more and more U.S. low- and medium-skill manufacturing has relocated overseas over the past decade – much, but not all of it to China – Chinese manufacturers (or at least, manufacturing facilities located in China) have absorbed a large portion of the former productive capacity of U.S. industry. U.S. manufacturers continue to maintain a competitive position in many higher-technology products, but whether or not the United States can maintain this technological edge will rely greatly on future market trends, as well as U.S. and Chinese trade policies.

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<sup>199</sup> In January 2011 “Bloomberg New Energy Finance, a research group, reported that investors had injected a record \$243 billion into cleaner sources of energy in 2010... Investment in clean energy in China rose 30 percent last year, to \$51.1 billion - by far the largest figure for a single country - and represented more than 20 percent of the total global investment...” (James Kanter, “China, Once Suspect on Emissions, is Rapidly Becoming a Clean-Energy Power”, *The New York Times*, January 26, 2011.)

<sup>200</sup> In 2009, three of the ten largest wind turbine manufacturers in the world were Chinese — Sinovel, Goldwind, and Dongfang. (John Acher, “China became top wind power market in 2009: consultant”, *Reuters*, March 29, 2010.)

<sup>201</sup> China has been the largest solar cell producer since 2008. In 2009, four of the ten largest photovoltaic cells and modules producers in the world were Chinese — Suntech Power, Yingli, JA Solar and Trina Solar. (Hirshman, W. P., “Surprise, surprise (cell production 2009: survey)”, *Photon International*, March 2010, pp. 176-199.)

**Appendix 1: List of Top 10 Exports from U.S. to China (HS, 4-digit)**

	2000	2001	2002	2003	2004
1	8802--AIRCRAFT, POWERED; SPACECRAFT & LAUNCH VEHICLES	8802--AIRCRAFT, POWERED; SPACECRAFT & LAUNCH VEHICLES	8802--AIRCRAFT, POWERED; SPACECRAFT & LAUNCH VEHICLES	1201--SOYBEANS, WHETHER OR NOT BROKEN	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS
2	1201--SOYBEANS, WHETHER OR NOT BROKEN	1201--SOYBEANS, WHETHER OR NOT BROKEN	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS	1201--SOYBEANS, WHETHER OR NOT BROKEN
3	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC <sup>202</sup>	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC	1201--SOYBEANS, WHETHER OR NOT BROKEN	8802--AIRCRAFT, POWERED; SPACECRAFT & LAUNCH VEHICLES	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS
4	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC	5201--COTTON, NOT CARDED OR COMBED	5201--COTTON, NOT CARDED OR COMBED
5	3100--FERTILIZERS, EXPORTS ONLY INCL OTHER CRUDE MAT'LS	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	3100--FERTILIZERS, EXPORTS ONLY INCL OTHER CRUDE MAT'LS	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT
6	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC
7	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS	3100--FERTILIZERS, EXPORTS ONLY INCL OTHER CRUDE MAT'LS	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8479--MACHINES ETC HAVING INDIVIDUAL FUNCTIONS
8	8479--MACHINES ETC HAVING INDIVIDUAL FUNCTIONS NESOI, PT	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	3100--FERTILIZERS, EXPORTS ONLY INCL OTHER CRUDE MAT'LS	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES
9	4101--RAW HIDES & SKINS OF BOVINE OR EQUINE ANIMALS	4101--RAW HIDES & SKINS OF BOVINE OR EQUINE ANIMALS	8479--MACHINES ETC HAVING INDIVIDUAL FUNCTIONS	7404--COPPER WASTE AND SCRAP	7404--COPPER WASTE AND SCRAP
10	8803--PARTS OF AIRCRAFT, SPACECRAFT ETC	8479--MACHINES ETC HAVING INDIVIDUAL FUNCTIONS	4101--RAW HIDES & SKINS OF BOVINE OR EQUINE ANIMALS	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS

<sup>202</sup> This category includes computer hardware.

Year by Year – Top 10 Exports (2005 to 2009) (HS, 4-digits)

	2005	2006	2007	2008	2009
1	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL. PTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL. PTS	1201--SOYBEANS, WHETHER OR NOT BROKEN	1201--SOYBEANS, WHETHER OR NOT BROKEN
2	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL. PTS	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL. PTS	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS
3	1201--SOYBEANS, WHETHER OR NOT BROKEN	1201--SOYBEANS, WHETHER OR NOT BROKEN	1201--SOYBEANS, WHETHER OR NOT BROKEN	8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS	8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL. PTS
4	5201--COTTON, NOT CARDED OR COMBED	5201--COTTON, NOT CARDED OR COMBED	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT
5	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT	7404--COPPER WASTE AND SCRAP	7404--COPPER WASTE AND SCRAP	--WASTE AND SCRAP OF PAPER OR PAPERBOARD
6	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	7404--COPPER WASTE AND SCRAP	7602--ALUMINUM WASTE AND SCRAP	7602--ALUMINUM WASTE AND SCRAP	7404--COPPER WASTE AND SCRAP
7	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC	7602--ALUMINUM WASTE AND SCRAP	4707--WASTE AND SCRAP OF PAPER OR PAPERBOARD	5201--COTTON, NOT CARDED OR COMBED	7602--ALUMINUM WASTE AND SCRAP
8	7602--ALUMINUM WASTE AND SCRAP	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	5201--COTTON, NOT CARDED OR COMBED	4707--WASTE AND SCRAP OF PAPER OR PAPERBOARD	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS
9	7404--COPPER WASTE AND SCRAP	4707--WASTE AND SCRAP OF PAPER OR PAPERBOARD	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS	3901--POLYMERS OF ETHYLENE, IN PRIMARY FORMS
10	4707--WASTE AND SCRAP OF PAPER OR PAPERBOARD	8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC	8486--MACH/APPS FOR MANUFCT OF SEMICNDCT BOULES,ETC,PART	8703--MOTOR CARS & VEHICLES FOR TRANSPORTING PERSONS	8703--MOTOR CARS & VEHICLES FOR TRANSPORTING PERSONS

Top Exports (2010)

- 1201--SOYBEANS, WHETHER OR NOT BROKEN
- 8800 - CIVILIAN AIRCRAFT, ENGINES, AND PARTS CIVILIAN AIRCRAFT, ENGINES, AND PARTS

3. 8542--ELECTRONIC INTEGRATED CIRCUITS & MICROASSEMBL, PTS
4. 8703--MOTOR CARS & VEHICLES FOR TRANSPORTING PERSONS
5. 7404--COPPER WASTE AND SCRAP
6. 5201--COTTON, NOT CARDED OR COMBED
7. 7602--ALUMINUM WASTE AND SCRAP
8. 7204--FERROUS WASTE & SCRAP; REMELT SCR IRON/STEEL INGOT
9. 4707--WASTE AND SCRAP OF PAPER OR PAPERBOARD
10. 8486--MACH/APPS FOR MANUFCT OF SEMICNDCT BOULES,ETC,PART

**Appendix 2: List of Top 10 Imports from U.S. to China (HS, 4-digit)**

	2000	2001	2002	2003	2004
1	8471--AUTOMATIC DATA PROCESS MACHINES <sup>203</sup>	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES
2	9503--TOYS	9503--TOYS	9503--TOYS	9503--TOYS	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES
3	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	8525--TRANS APPAR FOR RADIOTELE ETC, TV CAMERA & REC
4	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA
5	6402--FOOTWEAR, OUTER SOLE & UPPER RUBBER OR PLAST	9403--FURNITURE	9403--FURNITURE	9403--FURNITURE	9503--TOYS
6	9405--LAMPS & LIGHTING FITTINGS & PARTS	6402--FOOTWEAR, OUTER SOLE & UPPER RUBBER OR PLAST	9405--LAMPS & LIGHTING FITTINGS & PARTS	8525--TRANS APPAR FOR RADIOTELE ETC, TV CAMERA & REC	9403--FURNITURE
7	8527--RECEPTION APPARATUS FOR RADIOTELEPHONY	9405--LAMPS & LIGHTING FITTINGS & PARTS	6402--FOOTWEAR, OUTER SOLE & UPPER RUBBER OR PLAST	9504--ARTICLES FOR ARCADE TABLE OF PARLOR GAMES, PARTS	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC

<sup>203</sup> This category includes computers.

8	9403--FURNITURE	8527--RECEPTION APPARATUS FOR RADIOTELEPHONY	8525--TRANS APPAR FOR RADIOTELE ETC; TV CAMERA & REC	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS
9	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	9405--LAMPS & LIGHTING FITTINGS & PARTS	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS
10	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY	9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS	9405--LAMPS & LIGHTING FITTINGS & PARTS

	2005	2006	2007	2008	2009
1	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES	8471--AUTOMATIC DATA PROCESS MACHINES
2	8525--TRANS APPAR FOR RADIOTELE ETC; TV CAMERA & REC	8525--TRANS APPAR FOR RADIOTELE ETC; TV CAMERA & REC	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY	8517--ELECTRIC APPARATUS FOR LINE TELEPHONY
3	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8528--TV RECVRS, INCL VIDEO MONITORS & PROJECTORS	8528--TV RECVRS, INCL VIDEO MONITORS & PROJECTORS	8528--TV RECVRS, INCL VIDEO MONITORS & PROJECTORS
4	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	9403--FURNITURE	9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS	9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS	9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS
5	9503--TOYS	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES	9503--TOYS
6	9403--FURNITURE	8528--TV RECVRS, INCL VIDEO MONITORS & PROJECTORS	9503--TOYS	9503--TOYS	8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES
7	8528--TV RECVRS, INCL VIDEO MONITORS & PROJECTORS	9503--TOYS	9403--FURNITURE	9403--FURNITURE	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA



8	9504--ARTICLES FOR ARCADE TABLE OR PARLOR GAMES PARTS	9504--ARTICLES FOR ARCADE TABLE OR PARLOR GAMES PARTS	8443--PRINT MACH INCL INK-JET MACH ANCIL T PRNT PT	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	8443--PRINT MACH INCL INK-JET MACH ANCIL T PRNT PT
9	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS	6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA	8443--PRINT MACH INCL INK-JET MACH ANCIL T PRNT PT	9403--FURNITURE
10	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	4202--TRAVEL GOODS, HANDBAGS, WALLETS, JEWELRY CASES ETC	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS	9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS

### Top Imports (2010)

1. 8471--AUTOMATIC DATA PROCESS MACHINES; MAGN READER ETC
2. 8517--ELECTRIC APPARATUS FOR LINE TELEPHONY ETC, PARTS
3. 8528--TV RECVR, INCL VIDEO MONITORS & PROJECTORS
4. 8473--PARTS ETC FOR TYPEWRITERS & OTHER OFFICE MACHINES
5. 9503--TOYS NESOI; SCALE MODELS ETC; PUZZLES; PARTS ETC
6. 9504--ARTICLES FOR ARCADE, TABLE OR PARLOR GAMES, PARTS
7. 8443--PRINT MACH INCL INK-JET MACH ANCIL T PRNT PT NESOI
8. 6403--FOOTWEAR, OUTER SOLE RUB, PLAST OR LEA & UPPER LEA
9. 9403--FURNITURE NESOI AND PARTS THEREOF
10. 9401--SEATS (EXCEPT BARBER, DENTAL, ETC), AND PARTS