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Growth in U.S.–China trade deficit between 2001 and 2015 cost 3.4 million jobs

Here's how to rebalance trade and rebuild American manufacturing

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The United States has a massive trade deficit with China. It has grown since the end of the Great Recession. The growth of that deficit almost entirely explains the failure of manufacturing employment to fully recover along with the rest of the economy. And as other studies have suggested, the trade deficit has cost us millions of jobs since China entered the World Trade Organization (WTO) in 2001.

The growth of the trade deficit means that the United States is both losing jobs in manufacturing (in electronics and high tech, apparel, textiles, and a range of heavier durable goods industries) and missing opportunities to add jobs in manufacturing (in exporting industries such as transport equipment, agricultural products, computer and electronic parts, chemicals, machinery, and food and beverages) because imports from China have soared, and exports have increased much less. The trade deficit with China affects different regions in different ways. Some regions are devastated by layoffs and factory closings while others are surviving but not growing the way they could be if new factories were opening and existing plants were hiring more workers. This slowdown in manufacturing job generation is also contributing to stagnating wages and incomes of typical workers and widening inequality.

Following are the specific problems that call for a policy response:

U.S. jobs lost are spread throughout the country but hit hardest in manufacturing, including in industries in which the United States has held a competitive advantage

- Due to the trade deficit with China 3.4 million jobs were lost between 2001 and 2015, including 1.3 million jobs lost since the first year of the Great Recession in 2008. Nearly three-fourths (74.3 percent) of the jobs lost between 2001 and 2015 were in manufacturing (2.6 million manufacturing jobs displaced).
- The growing trade deficit with China has cost jobs in all 50 states and the District of Columbia, and in every congressional district in the United States.
- The trade deficit in the computer and electronic parts industry grew the most, and 1,238,300 jobs were lost or displaced, 36.0 percent of the 2001–2015 total. As a result, many of the hardest-hit congressional districts

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(in terms of the share of jobs lost) were in California, Texas, Oregon, Massachusetts, Minnesota, and Arizona, where jobs in that industry are concentrated. Some districts in Georgia, Illinois, New York, and North Carolina were also especially hard-hit by trade-related job displacement in a variety of manufacturing industries, including computer and electronic parts, textiles and apparel, and furniture. In addition, surging imports of steel, aluminum, and other capital intensive products threaten hundreds of thousands of jobs in these key industries as well.

- Global trade in advanced technology products—often discussed as a source of comparative advantage for the United States—is instead dominated by China. This broad category of high-end technology products includes the more advanced elements of the computer and electronic parts industry as well as other sectors such as biotechnology, life sciences, aerospace, and nuclear technology. In 2015, the United States had a $120.7 billion deficit in advanced technology products with China, and this deficit was responsible for 32.9 percent of the total U.S.–China goods trade deficit. In contrast, the United States had a $28.9 billion surplus in advanced technology products with the rest of the world in 2015.

Wage losses have hurt not just manufacturing workers but workers who don't have a college degree

- Between 2001 and 2011 alone, growing trade deficits reduced the incomes of directly impacted workers by $37 billion per year, and growing competition with imports from China and other low wage countries reduced the wages of all non–college graduates by $180 billion per year. Most of that income was redistributed to corporations, and to workers with college degrees in the very top of the income distribution, in higher profits and wages.

There are reasons for China's large and growing trade surpluses with the United States and the world that go far beyond the free market

China both subsidizes and dumps massive quantities of exports. Specifically it blocks imports, pirates software and technology from foreign producers, manipulates its currency, invests in massive amounts of excess production

capacity in a range of basic industries, often through state owned enterprises (SOEs) (investments that lead to dumping), and operates as a refuse lot for carbon and other industrial pollutants. China has also engaged in extensive and sustained currency manipulation over the past two decades, resulting in persistent currency misalignments. Other countries in the region have found it attractive to follow (and difficult to resist following) China's lead in engaging in currency manipulation, resulting in the region's large and growing trade surpluses with the United States and the world over the past 15 years.

China's actions call for direct policy responses

To adequately respond to these threats, Congress and the president should enhance enforcement of fair trade laws and treaty obligations (through anti-dumping, countervailing duty, and WTO case filings) and implement better early warning systems and mechanisms for responding to import surges. The United States should also make Chinese excess production capacity a priority to address in bilateral negotiations as it is this excess capacity that fuels dumping of exports in the United States. In particular, overcapacity should be addressed by reforming state-owned enterprises, barring China from all U.S. government procurement contracts, and prohibiting SOEs from foreign direct investment in U.S. manufacturing or high tech companies. The United States should also consider imposing a border-adjustable carbon fee on imports produced by energy-intensive industries. In addition, World Trade Organization nations should continue to treat China as a nonmarket economy in fair trade enforcement, because granting China market-economy status would curb the ability to impose tariffs on dumped goods and thus allow Chinese companies to undercut domestic production by flooding WTO nation markets with cheap goods. Also, China should not be rewarded for its market distortions with a bilateral investment treaty. Lastly, the United States must maintain currency vigilance and perhaps even consider negotiating a new Plaza Accord to rebalance currencies and global trade.

China isn't the only beneficiary from its unfair trade policies; U.S. multinationals have gained as well

U.S. national interests in generating domestic production and jobs have suffered while U.S. multinationals have enjoyed record profits on their foreign direct investments.

In short, the U.S.–China trade relationship needs to undergo a fundamental change. In addition to putting an end to the unfair trade practices outlined here, the new terms of this relationship must include action on China's part to reduce its massive and growing savings glut by raising wages, increasing spending on health care and pensions, and recognizing free and independent trade unions. Through these steps, China can raise consumption and end its persistent trade surpluses.

The U.S. trade deficit with China has increased since China entered into the WTO

U.S. proponents of China's entry into the World Trade Organization frequently claimed that letting China into the WTO would increase U.S. exports, improve the U.S. trade deficit with China, and create jobs in the United States.[1] In 2000, President Bill Clinton claimed that the agreement then being negotiated to allow China into the WTO would create "a win-win result for both countries." Exports to China "now support hundreds of thousands of American jobs," and these figures "can grow substantially with the new access to the Chinese market the WTO agreement creates," he said (Clinton 2000, 9–10).

China's entry into the WTO in 2001 was supposed to bring it into compliance with an enforceable, rules-based regime that would require China to open its markets to imports from the United States and other nations by reducing Chinese tariffs and addressing nontariff barriers to trade. Promoters of liberalized U.S.–China trade argued that the United States would benefit because of increased exports to a large and growing consumer market in China. The United States also negotiated a series of special safeguard measures designed to limit the disruptive effects of surging imports from China on domestic producers.

However, China's trade-distorting practices, aided by China's currency manipulation and misalignment, and its suppression of wages and labor rights, resulted in a flood of dumped and subsidized imports that greatly exceed the growth of U.S. exports to China. These trade-distorting practices included extensive subsidies to industries such as steel, glass, paper, concrete, and renewable energy industries and rapid growth of its state-owned enterprises, both of which generated a massive buildup of excess capacity in a range of these sectors. This excess capacity created a supply of goods far exceeding Chinese consumer demand and China dealt with the oversupply by dumping the exports elsewhere, primarily in the United States.

The promised surge of U.S. exports to China was also hampered by China's failure to implement certain policies to increase domestic demand for goods, including goods produced by trading partners. Specifically, for China to become a better market for U.S. exports, it needed to stimulate the growth of domestic consumption through policies that would allow workers to organize and bargain collectively, thus raising wages. China also needed to increase domestic consumption through increased social spending and reductions to the country's massive savings rate. Such policies are all elements of a program of domestic, demand-led growth that the United States, other advanced countries, and international agencies have called on China to implement for many years. But none of these policies have been implemented, and China's national savings rate has actually increased significantly over the past 15 years (Setser 2016d, IMF 2016b), which has contributed to the growth of U.S. trade deficits (Bernstein 2016).

In addition, the WTO agreement spurred foreign direct investment (FDI) in Chinese enterprises and the outsourcing of U.S. manufacturing plants, which has expanded China's manufacturing sector at the expense of the United States, thereby affecting the trade balance between the two countries. Finally, the core of the agreement failed to include any protections to maintain or improve labor or environmental standards or to prohibit currency manipulation. (The roles of FDI and of currency manipulation and misalignment in trade balances are explained later in this report.)

As a result of these forces, the U.S. trade deficit with China soared after China entered the WTO.

From 2001 to 2015, imports from China increased dramatically, rising from $102.3 billion in 2001 to $483.2 billion in 2015, as shown in **Table 1**.[2] U.S. exports to China rose at a rapid rate from 2001 to 2015, but from a much smaller base, from $19.2 billion in 2001 to $116.1 billion in 2015. As a result, China's exports to the United States in 2015 were more than four times greater than U.S. exports to China. These trade figures make the China trade relationship the United States' most imbalanced trade relationship by far (author's analysis of USITC 2016a).

Overall, the U.S. goods trade deficit with China rose from $83.0 billion in 2001 to $367.2 billion in 2015, an increase of $284.1 billion. Put another way, since China entered the WTO in 2001, the U.S. trade deficit with China has increased annually by $20.3 billion, or 11.2 percent, on average.

Between 2008 and 2015, the U.S. goods trade deficit with China increased $100.8 billion. This 37.9 percent increase occurred despite the collapse in world trade between 2008 and 2009 caused by the Great Recession and a decline in the U.S. trade deficit with the rest of the world of 30.2 percent between 2008 and 2015. As a result, China's share of the overall U.S. goods trade deficit increased from 32.0 percent in 2008 to 48.2 percent in 2015. (The figures in this paragraph derive from the author's analysis of USITC 2016a.)

The growing trade deficit with China has led to U.S. job losses

Each $1 billion in exports to another country from the United States supports some American jobs. However, each $1 billion in imports from another country leads to job loss—by destroying existing jobs and preventing new job creation—as imports displace goods that otherwise would have been made in the United States by domestic workers.[3] The net employment effect of trade depends on the changes in the trade balance. An improving trade balance can support job creation, but a growing trade deficit usually results in growing net U.S. job displacement.

This is what has occurred with China since it entered the WTO; the United States' widening trade deficit with China is costing U.S. jobs. While some imports of parts and components from China have gone into the production of final goods, some of which were

Table 1

U.S.–China goods trade and job displacement, 2001–2015

	2001	2008	2015	Change ($billions) 2001–2015	Change ($billions) 2008–2015	Percent change 2001–2015
U.S. goods trade with China ($ billions, nominal)						
U.S. total exports*	$19.2	$71.5	$116.1	$96.8	$44.6	503.4%
U.S. general imports	$102.3	$337.8	$483.2	$381.0	$145.5	372.5%
U.S. trade balance	-$83.0	-$266.3	-$367.2	-$284.1	-$100.8	342.1%
Average annual change in the trade balance				-$20.2	-$14.4	11.2%
				Change (thousands of jobs)		**Percent change**
U.S. trade-related jobs supported and displaced (thousands of jobs)						
U.S. total exports–jobs supported	171.9	544.2	826.6	654.7	282.4	380.8%
U.S. general imports–jobs displaced	1,129.6	3,621.2	5,227.6	4,098.0	1,606.4	362.8%
U.S. trade deficit–net jobs displaced	957.7	3,077.0	4,401.0	3,443.3	1,324.0	359.6%
Average annual change in net jobs displaced				246.0	189.1	11.5%

* Total exports as reported by the U.S. International Trade Commission include re-exports. Domestic exports are goods produced in the United States and exclude goods produced in other countries and shipped through the United States (known as foreign exports or re-exports). Domestic exports were estimated to be $107.7 billion in 2015. The employment estimates shown here are based on total exports. See footnote 3 for additional details.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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then exported to China and the rest of the world, the overall U.S. trade deficit in manufactured products with China and the rest of the world has grown substantially since China entered the WTO.

This paper describes the net effect of the trade on employment as jobs "lost or displaced," with the terms "lost" and "displaced" used interchangeably. The employment impacts of the growing U.S. trade deficit with China are estimated in this paper using an input-output model that estimates the direct and indirect labor requirements of producing output in a given domestic industry. The model includes 195 U.S. industries, 77 of which are in the manufacturing sector (see the box titled **"Trade and employment models,"** as well as the appendix, for details on model structure and data sources). The Bureau of Labor Statistics Employment Projections program (BLS–EP) revised and updated its labor requirements

model and related data in December 2013 (accessed by EPI in 2014; see BLS-EP 2014a and 2014b). Our models have been completely revised and updated using the best available data for this report.[4]

Trade and employment models

The Economic Policy Institute and other researchers have examined the job impacts of trade in recent years by subtracting the job opportunities lost to imports from those gained through exports. This report uses standard input-output models and data to estimate the jobs displaced by trade. Many reports by economists in the public and private sectors have used this type of all-but-identical methodology to estimate jobs gained or displaced by trade, including Groshen, Hobijn, and McConnell (2005) of the Federal Reserve Bank of New York, and Bailey and Lawrence (2004) in the *Brookings Papers on Economic Activity.* The U.S. Department of Commerce has published estimates of the jobs supported by U.S. exports (Tschetter 2010). That study used input-output and "employment requirements" tables from the Bureau of Labor Statistics Employment Projections program (BLS-EP 2014a), the same source used to develop job displacement estimates in this report. The Tschetter report represents the work of a panel of experts from 20 federal agencies.

The model estimates the amount of labor (number of jobs) required to produce a given volume of exports and the labor displaced when a given volume of imports is substituted for domestic output. The difference between these two numbers is essentially the jobs displaced by the growing trade deficit, holding all else equal.

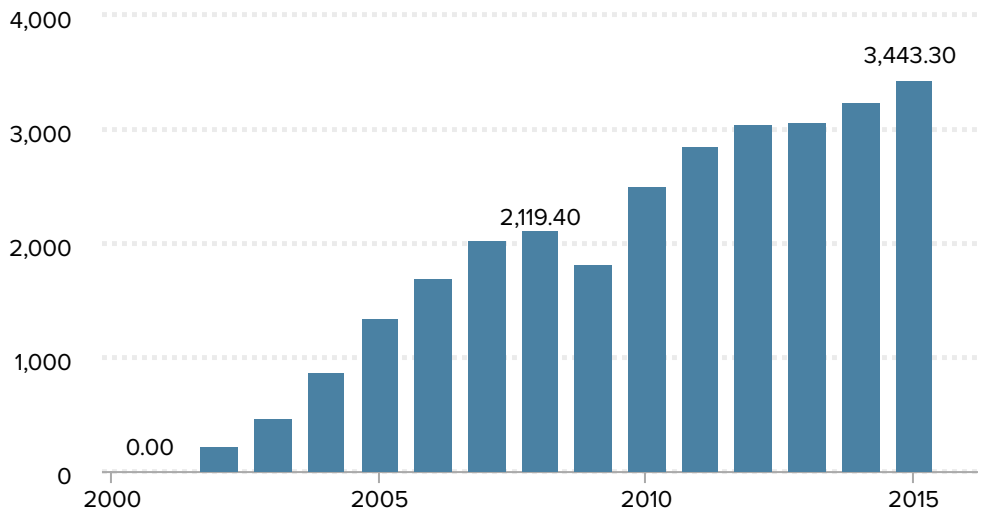
Jobs displaced by the growing China trade deficit are a net drain on employment in trade-related industries, especially those in manufacturing. Even if increases in demand in other sectors absorb all the workers displaced by trade (which is unlikely), job quality will likely suffer because many nontraded industries such as retail and home health care pay lower wages and have less comprehensive benefits than traded-goods industries (Scott 2013, 2016a).

As shown in the bottom half of Table 1, U.S. exports to China in 2001 supported 171,900 jobs, but U.S. imports displaced production that would have supported 1,129,600 jobs. Therefore, the $83.0 billion trade deficit in 2001 displaced 957,700 jobs in that year. Net job displacement rose to 3,077,000 jobs in 2008 and 4,401,000 jobs in 2015.

That means that since China's entry into the WTO in 2001 and through 2015, the increase in the U.S.–China trade deficit eliminated or displaced 3,443,300 U.S. jobs. Also shown in Table 1, the U.S. trade deficit with China increased by $100.8 billion (or 37.9 percent) between 2008 and 2015. During that period, the number of jobs displaced increased by 43.0 percent.

Figure A

U.S. jobs displaced by the growing goods trade deficit with China since 2001 (in thousands of jobs)



Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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For comparative purposes, the growth of the U.S.–China trade deficit between 2001 and 2015 represents a direct loss of 1.6 percent of U.S. GDP in 2015 (author's analysis of BEA 2016a). Using a macroeconomic model with standard economic multipliers (see Appendix: Methodology in Scott and Glass 2016 for further details) yields an estimate of 3.4 million jobs displaced by a trade deficit of this magnitude, providing further support for the job displacement estimates shown in Table 1.[5]

Total jobs lost or displaced between 2008 and 2015 alone amounted to 1,324,000, either by the elimination of existing jobs or by the prevention of new job creation through the displacement of domestic production by imports. **Figure A** shows visually how rising trade deficits have displaced a growing number of jobs every year since China joined the WTO, with the exception of 2009 (during the Great Recession). On average, 246,000 jobs per year have been lost or displaced since China's entry into the WTO (as shown in Table 1, last row, and data column four). The continuing growth of job displacement between 2008 and 2015 despite the relatively small increase in the bilateral trade deficit in this period reflects the relatively rapid growth of U.S. imports of computer and electronic parts from China, discussed below, and the fact that the price index for most of these products fell continuously throughout the study period. The share of U.S. imports from China accounted for by computer and electronic parts (in current, nominal dollars) increased from 32.7 percent in 2008 to 36.5 percent in 2015 (according to the authors' analysis of USITC 2016a).

Unfortunately, growing job losses due to outsourcing and growing trade deficits with China are only part of the story.

The rapid growth of U.S. imports of computer and electronic parts from China also highlights the threat to national security imposed by the outsourcing of U.S. defense industries, as explained by Brigadier General John Adams (2015). The outsourcing of the defense industry makes the United States vulnerable to disruption of supply chains for key missile and communications components. Outsourcing has also reduced the quality of military equipment: a congressional report found nearly 1 million counterfeit components in the supply chain for "critical" defense systems (Senate Armed Services Committee 2012). And outsourcing has eroded the capacity of the defense industrial base for cost innovation, knowledge generation, and support for domestic employment (Alliance for American Manufacturing 2016).

Furthermore, China is also a major trading partner with Canada, Japan, Malaysia, Mexico, and Vietnam, all members of the proposed TPP agreement. If an agreement such as the TPP agreement is approved it would provide a backdoor for dumped and subsidized inputs from China and other countries that are not members of the agreement (Scott 2016b).

Next we turn to analysis of direct China trade and job loss in more detail.

The trade deficit and job losses, by industry

The composition of imports from China is changing in fundamental ways, with significant, negative implications for certain kinds of high-skill, high-wage jobs once thought to be the hallmark of the U.S. economy. China is moving rapidly "upscale," from low-tech, low-skilled, labor-intensive industries such as apparel, footwear, and basic electronics to more capital- and skills-intensive industries such as computers, electrical machinery, and motor vehicle parts. It has developed a rapidly growing trade surplus in these specific industries, and in high-technology products in general.

Table 2 provides a snapshot of the changes in goods trade flows between 2001 and 2015, by industry, for imports, exports, and the trade balance. The rapid growth of the bilateral trade deficit in computer and electronic parts (including computers, parts, semiconductors, and audio and video equipment) accounted for 49.3 percent of the $284.1 billion increase in the U.S. trade deficit with China between 2001 and 2015. In 2015, the total U.S. trade deficit with China was $367.2 billion—$159.3 billion of which was in computer and electronic parts (trade flows by industry in 2001 and 2015 are shown in **Supplemental Table 5**, available at the end of this document).

As evident in the increasing trade balance and also shown in Table 2, imports from China far exceeded exports to China between 2001 and 2015. Table 2 further shows that the growth in manufactured goods imports explained virtually all (99.3 percent) of total growth in imports from China between 2001 and 2015, and included a wide array of products. Computer and electronic parts were responsible for 40.0 percent of the growth in imports in this period, including computer equipment ($55.3 billion, or 14.5 percent of the overall

Table 2

Change in U.S. goods trade with China, by industry, 2001–2015

Industry*	Imports		Exports		Trade balance	
	Change ($billions, nominal)	Share of total change	Change ($billions, nominal)	Share of total change	Change ($billions, nominal)	Share of total change
Total change	381.0	100.0%	96.8	100.0%	-284.1	100.0%
Agriculture, forestry, fishing, and hunting	2.2	0.6%	15.8	16.3%	13.5	-4.8%
Mining	0.0	0.0%	2.1	2.1%	2.1	-0.7%
Oil and gas	-0.1	0.0%	1.0	1.0%	1.1	-0.4%
Minerals and ores	0.1	0.0%	1.1	1.1%	1.0	-0.4%
Manufacturing	378.4	99.3%	74.0	76.4%	-304.4	107.2%
Nondurable goods	51.8	13.6%	5.0	5.2%	-46.8	16.5%
Food	3.0	0.8%	2.5	2.6%	-0.4	0.2%
Beverage and tobacco products	0.0	0.0%	1.7	1.8%	1.7	-0.6%
Textile mills and textile product mills	10.8	2.8%	0.4	0.4%	-10.4	3.7%
Apparel	25.0	6.6%	0.0	0.0%	-25.0	8.8%
Leather and allied products	13.0	3.4%	0.3	0.4%	-12.7	4.5%
Industrial supplies	37.9	10.0%	17.0	17.5%	-21.0	7.4%
Wood products	3.1	0.8%	1.1	1.1%	-2.0	0.7%
Paper	3.2	0.8%	1.9	2.0%	-1.2	0.4%
Printed matter and related products	1.8	0.5%	0.1	0.2%	-1.7	0.6%
Petroleum and coal products	0.3	0.1%	0.9	1.0%	0.6	-0.2%
Chemicals	12.2	3.2%	11.2	11.6%	-1.0	0.3%
Plastics and rubber products	12.5	3.3%	1.1	1.2%	-11.4	4.0%
Nonmetallic mineral products	4.9	1.3%	0.5	0.5%	-4.4	1.5%
Durable goods	288.7	75.8%	52.0	53.7%	-236.7	83.3%
Primary metal	4.5	1.2%	1.6	1.6%	-2.9	1.0%
Fabricated metal products	17.4	4.6%	1.9	2.0%	-15.5	5.4%
Machinery	25.5	6.7%	7.0	7.2%	-18.5	6.5%
Computer and electronic parts	152.3	40.0%	12.1	12.4%	-140.2	49.3%
Computer and peripheral equipment	55.3	14.5%	0.6	0.6%	-54.6	19.2%
Communications, audio and video equipment	72.8	19.1%	1.8	1.9%	-71.0	25.0%
Navigational, measuring, electromedical, and control instruments	6.3	1.7%	4.5	4.6%	-1.8	0.7%
Semiconductor and other electronic components, and reproducing magnetic and optical media	17.9	4.7%	5.1	5.3%	-12.8	4.5%
Electrical equipment, appliances, and components	27.9	7.3%	2.2	2.3%	-25.7	9.0%
Transportation equipment	15.7	4.1%	23.9	24.7%	8.3	-2.9%
Motor vehicles and motor vehicle parts	13.5	3.5%	11.0	11.4%	-2.5	0.9%
Aerospace products and parts	0.8	0.2%	12.8	13.3%	12.1	-4.2%
Railroad, ship, and other transportation equipment	1.4	0.4%	0.1	0.1%	-1.3	0.5%
Furniture and related products	15.2	4.0%	0.1	0.2%	-15.1	5.3%
Miscellaneous manufactured commodities	30.4	8.0%	3.3	3.4%	-27.1	9.5%
Information **	0.0	0.0%	0.1	0.1%	0.1	0.0%
Scrap and second-hand goods	0.3	0.1%	4.9	5.1%	4.6	-1.6%

* Excludes utilities, construction, and service sectors, which reported no goods trade in this period.
** Includes publishing industries (excluding Internet); goods trade in this sector is concentrated in NAICS 5111, newspaper, periodical, book, and directory publishers.

Table 2 (cont.)

Source: Author's analysis of U.S. International Trade Commission (USITC 2016a). For a more detailed explanation of the data sources and computations, see the appendix.

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growth in imports) and communications, audio, and video equipment ($72.8 billion, or 19.1 percent). Other major importing sectors included machinery ($25.5 billion, or 6.7 percent), apparel ($25.0 billion, or 6.6 percent) and miscellaneous manufactured commodities ($30.4 billion, or 8.0 percent).

As Table 2 shows, manufacturing was also the top sector exporting to China—76.4 percent of the growth in exports to China between 2001 and 2015 was in manufactured goods, totaling $74.0 billion. Within manufacturing, key export-growth industries included chemicals ($11.2 billion, or 11.6 percent of the growth in exports), aerospace products and parts ($12.8 billion, or 13.3 percent), motor vehicles and parts ($11.0 billion, or 11.4 percent), and machinery ($7.0 billion, or 7.2 percent). Scrap and second-hand goods industries (which support no jobs, according to BLS–EP 2014a models[6]) accounted for 5.1 percent ($4.9 billion) of the growth in exports.[7]

Agricultural exports, which were dominated by corn, soybeans, and other cash grains, grew faster than any individual manufacturing industry except for transportation equipment, increasing $15.8 billion (16.3 percent of the total increase) between 2001 and 2015. Nonetheless, the overall scale of U.S. total exports to China in 2015 was dwarfed by imports from China in that year, which exceeded the value of exports by more than 4 to 1, as shown in Table 1.

The import data in Table 2 reflect China's rapid expansion into higher-value-added commodities once considered strengths of the United States, such as computer and electronic parts, which accounted for 36.5 percent ($176.6 billion) of U.S. imports from China in 2015 (as shown in Supplemental Table 5). This growth is apparent in the shifting trade balance in advanced technology products (ATP), a broad category of high-end technology goods trade tracked by the U.S. Census Bureau (but not broken out in Table 2, which uses U.S. International Trade Commission data).[8] ATP includes the more advanced elements of the computer and electronic parts industry as well as other sectors such as biotechnology, life sciences, aerospace, nuclear technology, and flexible manufacturing. The ATP sector includes some auto parts; China is one of the top suppliers of auto parts to the United States, having surpassed Germany (Scott and Wething 2012).

In 2015, the United States had a $120.7 billion trade deficit with China in ATP, reflecting a tenfold increase from $11.8 billion in 2002.[9] This ATP deficit was responsible for 32.9 percent of the total U.S.–China trade deficit in 2015. It dwarfs the $28.9 billion surplus in ATP that the United States had with the rest of the world in 2015. As a result of the U.S. ATP deficit with China, the United States ran an overall deficit in ATP products in 2015 (of $91.8 billion), as it has in every year since 2002 (U.S. Census Bureau 2016c).

Job loss or displacement by industry is directly related to trade flows by industry, as shown in **Table 3**.[10] The growing trade deficit with China eliminated 2,557,100 manufacturing jobs between 2001 and 2015, nearly three-fourths (74.3 percent) of the total. By far the largest

job displacements occurred in the computer and electronic parts industry, which lost 1,238,300 jobs (36.0 percent of the 3.4 million jobs displaced overall). This industry includes computer and peripheral equipment (670,800 jobs, or 19.5 percent of the overall jobs displaced), semiconductors and components (282,500 jobs, or 8.2 percent), and communications, audio, and video equipment (267,000 jobs, or 7.8 percent). Other hard-hit industries included apparel (204,900 jobs displaced, equal to 6.0 percent of the total), fabricated metal products (161,800, or 4.7 percent), textile mills and textile product mills (117,800, or 3.4 percent), miscellaneous manufactured commodities (127,000, or 3.7 percent), furniture and related products (115,900, or 3.4 percent), plastics and rubber products (78,800,or 2.3 percent), and motor vehicles and motor vehicle parts (49,600, or 1.4 percent). Several service industries, which provide key inputs to traded-goods production, experienced significant job displacement, including administrative and support and waste management and remediation services (211,500 jobs, or 6.1 percent) and professional, scientific, and technical services (183,000 jobs, or 5.3 percent).

These job displacement estimates are based on changes in the real value of exports and imports. For example, while the share of U.S. imports accounted for by computer and electronic parts from China rose from 23.8 percent in 2001 to 36.5 percent in 2015 (to $176.6 billion, as shown in Supplemental Table 5), the average price indexes (deflators) for most of these products fell sharply between 2001 and 2015—39.7 percent on a trade-weighted basis. Thus, the real value of computer and electronic imports increased more than twelvefold in this period, rising from $19.5 billion to $245.3 billion in 2015 in constant 2005 dollars (author's analysis of real trade flows—see methodology appendix for data sources and computational details).[11]

Missed opportunities to create more jobs through fair trade with China

The trade and jobs analysis in this report is focused on the actual jobs gained and lost due to increased trade with China over the past 15 years. This raises the question of what trade and employment could have looked like but for the massive growth of the U.S. trade deficit with China between 2001 and 2015. Most of the growth in this deficit was due to a proliferation of unfair trade arising from a variety of Chinese policies that are discussed below, including China's excess production capacity in a range of industries, the growth in its state-owned industries, its pervasive dumping of products at below cost and extensive network of illegal subsidies, its persistent, sustained currency manipulation, and its suppression of labor rights.

Evaluation of alternative paths of U.S.–China trade over the past 15 years would require the development of one or more counterfactual scenarios of how trade could have evolved at a detailed level. A full analysis of such scenarios at the level of employment impacts by industry and geographic area is beyond the scope of this report. It will be the subject of future research. But the broad outlines of one such scenario can be quickly sketched from the trade data in Table 2.

Table 3

Net U.S. jobs created or displaced by goods trade with China, by industry, 2001–2015

	Total	Share of total jobs displaced
Total*	-3,443,300	
Subtotal, nonmanufacturing	-886,200	25.7%
Agriculture, forestry, fishing, and hunting	43,400	-1.3%
Mining	-4,700	0.1%
Oil and gas	-700	0.0%
Minerals and ores	-4,000	0.1%
Utilities	-12,700	0.4%
Construction	-16,600	0.5%
Manufacturing	-2,557,100	74.3%
Nondurable goods	-391,300	11.4%
Food	-11,600	0.3%
Beverage and tobacco products	3,000	-0.1%
Textile mills and textile product mills	-117,800	3.4%
Apparel	-204,900	6.0%
Leather and allied products	-60,000	1.7%
Industrial supplies	-233,600	6.8%
Wood products	-28,400	0.8%
Paper	-29,200	0.8%
Printed matter and related products	-35,000	1.0%
Petroleum and coal products	-1,200	0.0%
Chemicals	-27,600	0.8%
Plastics and rubber products	-78,800	2.3%
Nonmetallic mineral products	-33,400	1.0%
Durable goods	-1,932,200	56.1%
Primary metal	-57,100	1.7%
Fabricated metal products	-161,800	4.7%
Machinery	-94,800	2.8%
Computer and electronic parts	-1,238,300	36.0%
Computer and peripheral equipment	-670,800	19.5%
Communications, audio, and video equipment	-267,000	7.8%
Navigational, measuring, electromedical, and control instruments	-18,000	0.5%

Table 3 (cont.)

	Total	Share of total jobs displaced
Semiconductors and other electronic components, and reproducing magnetic and optical media	-282,500	8.2%
Electrical equipment, appliances, and components	-116,000	3.4%
Transportation equipment	-21,500	0.6%
Motorvehicles and motor vehicle parts	-49,600	1.4%
Aerospace products and parts	32,700	-0.9%
Railroad, ship, and other transportation equipment	-4,500	0.1%
Furniture and related products	-115,900	3.4%
Miscellaneous manufactured commodities	-127,000	3.7%
Wholesale trade	0	0.0%
Retail trade	0	0.0%
Transportation and warehousing	-106,000	3.1%
Information	-84,200	2.4%
Finance and insurance	-45,500	1.3%
Real estate and rental and leasing	-27,200	0.8%
Professional, scientific, and technical services	-183,000	5.3%
Management of companies and enterprises	-119,700	3.5%
Administrative and support and waste management and remediation services	-211,500	6.1%
Education services	-2,800	0.1%
Healthcare and social assistance	-1,700	0.0%
Arts, entertainment, and recreation	-13,100	0.4%
Accomodation and food services	-51,700	1.5%
Other services (except public administration)	-30,500	0.9%
Public administration	-18,600	0.5%

*Subcategory and overall totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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To have maintained a stable trade balanced trade with China between 2001 and 2015, imports would have had to grow less rapidly, exports would have had to grow more rapidly, or some combination of the two. For example, had U.S. export growth to China matched the growth of China's exports to the United States dollar for dollar between 2001 and 2015, balanced trade would have required roughly a fourfold increase in U.S. exports to China in 2015.[12] If the 2001–2015 growth in exports in each industry (shown in Table 2) increased by this ratio, then the largest growth in exports would have occurred in

transportation equipment ($94.1 billion), agricultural products ($62.0 billion), computer and electronic parts ($47.4 billion), chemicals ($44.1 billion), machinery ($27.3 billion), and food and beverage products ($16.6 billion). In total, U.S. exports to China would have increased by $381.0 billion, $284.1 billion more than they actually did.[13]

If exports to China had increased at this pace, it would have supported the creation of millions of U.S. manufacturing jobs, and prevented much of the collapse of overall U.S. manufacturing employment between 2001 and 2015, when 3.4 million U.S. manufacturing jobs were lost (BLS 2016c). This level of growth in U.S. exports to China could not have taken place without major, structural changes in China's trade, industrial, macroeconomic, and labor policies. This analysis does illustrate the potential gains had China trade delivered on the promises made by China trade proponents when China entered the WTO in 2001.

Job losses by state

Growing U.S. trade deficits with China have reduced demand for goods produced in every region of the United States and led to job displacement in all 50 states and the District of Columbia, as shown in **Table 4** and **Figure B**. (**Supplemental Table 1** ranks the states by the number of net jobs displaced, while **Supplemental Table 2** ranks the states by jobs displaced as a share of total state jobs and presents the states alphabetically.) Table 4 shows that jobs displaced from 2001 to 2015 due to the growing goods trade deficit with China ranged from 0.79 percent to 3.82 percent of total state employment. The 10 hardest-hit states ranked by job shares displaced were Oregon, California, New Hampshire, Minnesota, North Carolina, Massachusetts, Wisconsin, Texas, Rhode Island, and Vermont. As shown in Supplemental Table 1, the top four states in terms of total jobs lost were California, Texas, New York, and Illinois. California lost 589,100 jobs, compared with 321,300 in Texas, 191,500 in New York, and 149,400 in Illinois. The 3.4 million U.S. jobs displaced due to the growing trade deficit with China between 2001 and 2015 represented 2.45 percent of total U.S. employment.

Figure B shows the broad impact of the growing trade deficit with China across the United States, with no areas exempt. Job losses have been most concentrated in states with high-tech industries, such as Arizona, California, Colorado, Idaho, Massachusetts, Minnesota, Oregon, and Texas, and in manufacturing states, including New Hampshire, North Carolina, and Vermont. Other hard-hit states include traditional manufacturing powers such as Georgia, Kentucky, Indiana, Illinois, Rhode Island, South Carolina, Tennessee, and Wisconsin.

Table 4

Net U.S. jobs displaced due to goods trade deficit with China, by state, 2001–2015 (ranked by jobs displaced as a share of total state employment)

Rank	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as share of state employment
1	*Oregon*	65,400	1,710,300	3.82%
2	*California*	589,100	16,426,700	3.59%
3	*New Hampshire*	24,000	684,800	3.50%
4	*Minnesota*	89,100	2,728,900	3.27%
5	*North Carolina*	131,100	4,195,800	3.12%
6	*Massachusetts*	101,700	3,284,700	3.10%
7	*Wisconsin*	79,100	2,819,500	2.81%
8	*Texas*	321,300	11,455,100	2.80%
9	*Rhode Island*	14,000	511,200	2.74%
10	*Vermont*	8,800	327,300	2.69%
11	*Indiana*	78,600	2,934,500	2.68%
12	*Idaho*	18,300	684,900	2.67%
13	*South Carolina*	50,700	1,968,900	2.58%
14	*Illinois*	149,400	5,926,900	2.52%
15	*Kentucky*	46,000	1,838,400	2.50%
16	*Tennessee*	69,500	2,784,500	2.50%
17	*Colorado*	62,100	2,492,400	2.49%
18	*Georgia*	104,200	4,193,800	2.48%
19	*Alabama*	48,000	1,981,100	2.42%
20	*Arizona*	64,700	2,688,000	2.41%
21	*New Jersey*	99,100	4,152,500	2.39%
22	*Utah*	29,700	1,260,800	2.36%
23	*Pennsylvania*	136,700	5,853,300	2.34%
24	*Ohio*	121,500	5,213,500	2.33%
25	*Arkansas*	27,600	1,235,800	2.23%
26	*Michigan*	93,600	4,191,900	2.23%
27	*Connecticut*	38,400	1,742,500	2.20%
28	*New York*	191,500	8,959,000	2.14%
29	*Mississippi*	24,200	1,181,300	2.05%
30	*Maine*	12,900	643,100	2.01%

Table 4 (cont.)

Rank	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as share of state employment
31	*Iowa*	29,900	1,538,800	1.94%
32	*Oklahoma*	32,600	1,681,800	1.94%
33	*Washington*	59,900	3,118,000	1.92%
34	*Missouri*	50,700	2,742,100	1.85%
35	*Virginia*	69,600	3,860,100	1.80%
36	*Kansas*	22,300	1,389,000	1.61%
37	*Maryland*	46,000	2,894,600	1.59%
38	*Florida*	128,100	8,101,900	1.58%
39	*New Mexico*	13,700	869,800	1.58%
40	*Nebraska*	14,800	943,600	1.57%
41	*South Dakota*	6,500	415,600	1.56%
42	*Delaware*	6,100	420,400	1.45%
43	*West Virginia*	10,800	748,600	1.44%
44	*Nevada*	16,700	1,204,900	1.39%
45	*Louisiana*	21,800	1,973,900	1.10%
46	*Hawaii*	6,800	629,500	1.08%
47	*Montana*	4,800	480,000	1.00%
48	*District of Columbia*	3,100	310,600	1.00%
49	*North Dakota*	3,500	370,800	0.94%
50	*Alaska*	3,100	344,300	0.90%
51	*Wyoming*	2,300	290,000	0.79%
*Total**		3,443,400	140,399,600	2.45%

Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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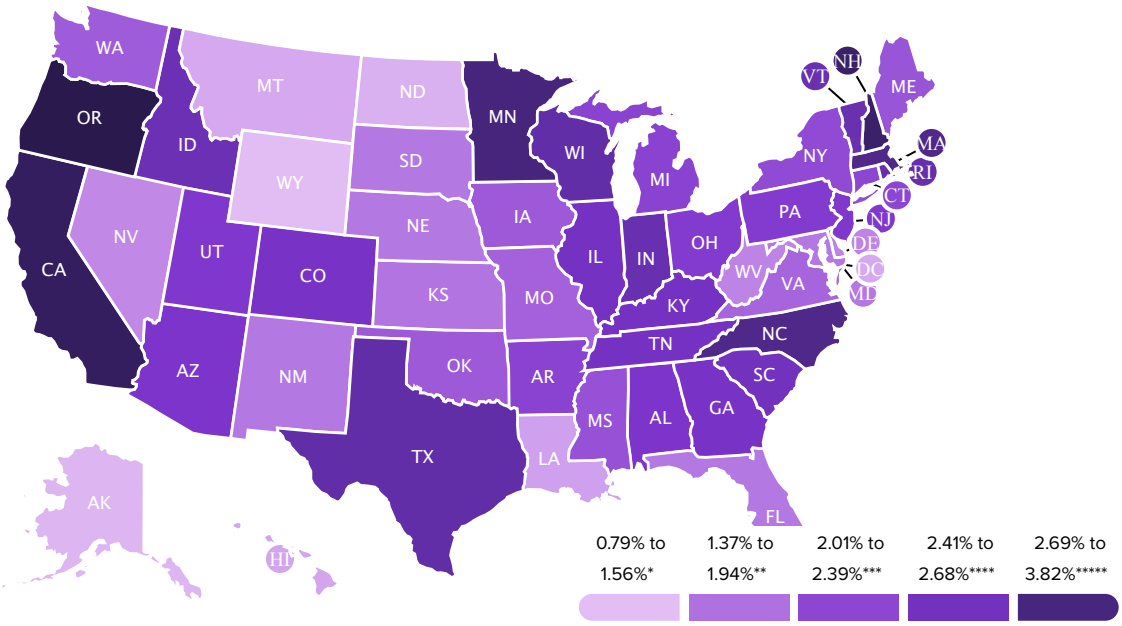
Job losses by congressional district

This study also reports the employment impacts of the growing U.S. goods trade deficit with China in every congressional district, including the District of Columbia. The top 20 hardest-hit congressional districts are shown in **Table 5**. **Figure C** shows job displacement in all 435 congressional districts plus the District of Columbia, as a share of total district employment. (Data for all 435 districts plus the District of Columbia are also provided in **Supplemental Tables 3 and 4** at the end of this report.) Because the largest growth in

Figure B

Net U.S. jobs displaced due to the goods trade deficit with China as a share of total state employment, 2001–2015



* 10 least-affected states, plus D.C.
** 10 next-least-affected states
*** 10 midde-affected states
**** 10 next-most-affected states
***** 10 most-affected states

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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the goods trade deficits with China occurred in the computer and electronic parts industry, many hard-hit congressional districts were in Arizona, California, Illinois, Massachusetts, Minnesota, New York, Oregon, and Texas where remaining jobs in that industry are concentrated. Other states with hard-hit districts include Georgia and North Carolina, which suffered considerable job displacement in a variety of manufacturing industries.[14]

Specifically, of the top 20 hardest-hit districts, eight were in California (in rank order, the 17th, 18th, 19th, 15th, 40th, 34th, 52nd, and 45th), four were in Texas (31st, 3rd, 10th, and 18th), and one each in Oregon (1st), Georgia (14th), Massachusetts (3rd), Illinois (6th), Minnesota (1st), New York (18th), North Carolina (2nd) and Arizona (5th). Job losses in these districts ranged from 13,200 jobs to 60,900 jobs, and 4.34 percent to 17.60 percent of total district jobs. These distributions reflect both the size of some states (e.g., California and Texas) and also the concentration of the industries hardest-hit by the growing U.S.–China trade deficit, such as computer and electronic parts and other industries including furniture, textiles, apparel, and other manufactured products. Overall, the 2.6 million manufacturing jobs lost were responsible for 74.3 percent of the 3.4 million jobs displaced by the growing U.S.–China trade deficit between 2001 and 2015 (Table 3).

Table 5

Twenty congressional districts hardest hit by U.S. goods trade deficit with China, 2001–2015 (ranked by jobs displaced as a share of district employment)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of district employment
1	*California*	17	60,900	346,100	17.60%
2	*California*	18	49,500	344,500	14.37%
3	*California*	19	39,400	324,000	12.16%
4	*Texas*	31	34,700	323,000	10.74%
5	*Oregon*	1	32,500	377,200	8.62%
6	*California*	15	27,600	336,400	8.20%
7	*Georgia*	14	17,400	290,700	5.99%
8	*Texas*	3	21,900	371,200	5.90%
9	*California*	40	16,300	280,500	5.81%
10	*Massachusetts*	3	20,600	355,400	5.80%
11	*California*	34	16,700	309,400	5.40%
12	*California*	52	17,600	350,100	5.03%
13	*Texas*	10	17,100	342,600	4.99%
14	*Illinois*	6	17,200	355,600	4.84%
15	*Minnesota*	1	16,600	348,200	4.77%
16	*California*	45	16,400	354,400	4.63%
17	*Texas*	18	13,800	306,400	4.50%
18	*New York*	18	14,900	332,100	4.49%
19	*North Carolina*	2	13,200	303,800	4.34%
20	*Arizona*	5	13,800	317,900	4.34%

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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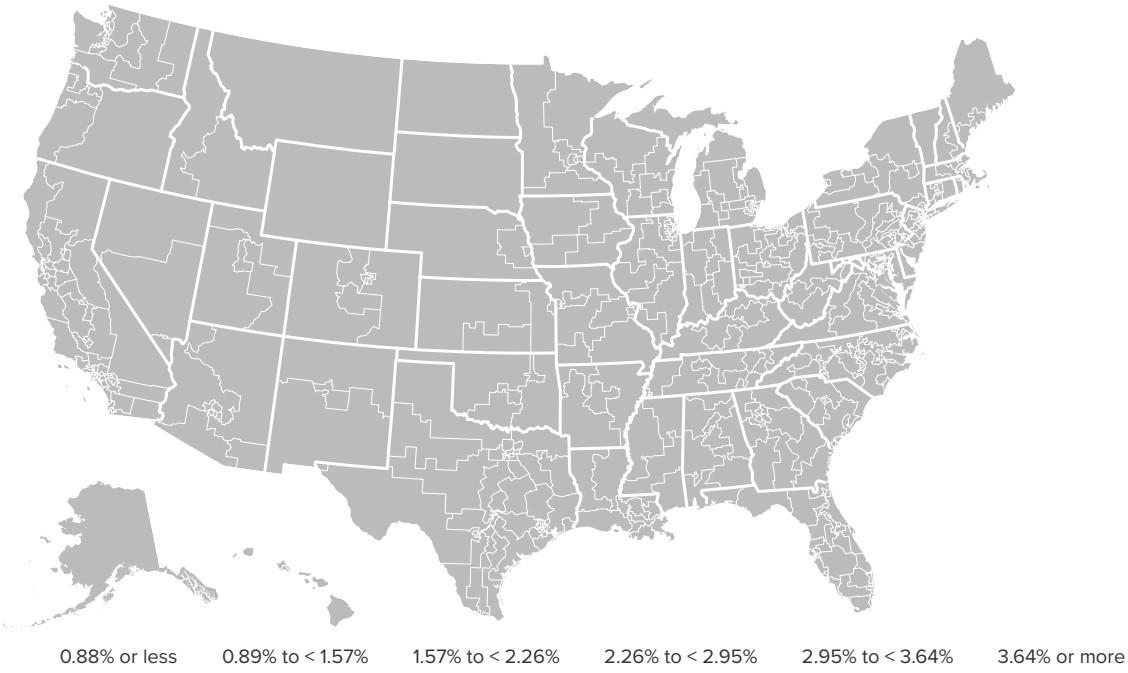
The three hardest-hit congressional districts were all located in Silicon Valley in California, including the 17th (South Bay, encompassing Sunnyvale, Cupertino, Santa Clara, Fremont, Newark, North San Jose, and Miltpitas[15]), which lost 60,900 jobs, equal to 17.60 percent of all jobs in the district), the 18th Congressional District (including parts of San Jose, Palo Alto, Redwood City, Menlo Park, Stanford, Los Altos, Campbell, Saratoga, Mountain View, and Los Gatos), which lost 49,500 jobs, 14.37 percent), and the 19th Congressional District (most of San Jose and other parts of Santa Clara County), which lost 39,400 jobs, 12.16 percent of all jobs.

Figure C

Net U.S. jobs displaced due to the goods trade deficit with China as a share of total congressional district employment, 2001–2015



Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

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Although the San Francisco Bay Area has experienced rapid growth over the past decade in software and related industries, this growth has come at the expense of direct employment in the production of computer and electronic parts. This manufacturing sector has experienced more actual job losses than any other major manufacturing industry since China joined the WTO.[16] There are substantial questions about the long-run ability of firms in the high-tech sectors to continue to innovate while offshoring most or all of the production in their industries (Shi 2010).

Other research confirms job losses from U.S.–China trade

Recent academic research has confirmed findings in this and earlier EPI research (e.g., Kimball and Scott 2014) that the growing U.S.–China trade deficit has caused significant loss of U.S. jobs, especially in manufacturing.

For example, Acemoglu et al. (2014) find that import competition with China from 1999 to 2011 was responsible for up to 2.4 million net job losses (including direct, indirect, and respending effects).[17] This result compares with the finding in this paper that 2.9 million

jobs were lost due to growing trade deficits with China between 2001 and 2011, as shown in Figure A (interactive data, available on the web). Thus, over a roughly comparable period, Acemoglu et al. estimate an employment impact that is roughly 80 percent as large as the estimate found in this study.[18]

Further academic confirmation of the impacts of China trade on manufacturing employment is provided by Pierce and Schott (2016). The authors use an entirely different estimation technique based on differences in the pre- and post-China WTO entry maximum tariff rates, with and without permanent normal trade relations status (PNTR), which the United States granted to China in the China–WTO implementing legislation. Pierce and Schott estimate the impacts of changes in U.S. international transactions between 1992 and 2008. They find that the grant of PNTR status to China "reduced relative employment growth of the average industry by 3.4 percentage points … after one year [and] 15.6 percentage points after 6 years" (following the grant of PNTR status to China in 2001). They do not translate percentage-point changes in employment into total jobs displaced, but data on changes in total manufacturing employment in this period provide a base of comparison.

The research in this paper looks at the total loss or displacement of jobs due to the growing trade deficit with China and the number of those lost jobs that are manufacturing jobs. We can check the consistency of this finding with a different approach—looking at the total loss of manufacturing jobs and estimating the number of those job losses that are due to growing trade deficits with China. The United States lost 3.4 million manufacturing jobs between December 2001 and December 2015, a decline of 21.5 percent in total manufacturing employment (BLS 2016c). Drawing from Pierce and Schott (2016) above, if 15.6 percentage points of this 21.5 percent decline can be attributed to the growth of the U.S. trade deficit with China, this implies that about 72.6 percent (or 2.5 million) of the manufacturing jobs lost in this period were lost due to the growing trade deficit with China. This estimate is nearly identical to this study's estimated total manufacturing jobs displaced by the growing U.S.–China trade deficit (2.6 million net jobs displaced). Thus, two other recent academic studies have concluded that the growing U.S.–China trade deficit is responsible for the displacement of at least 1 to 2 million U.S. manufacturing jobs since 1990, with most jobs lost since China entered the WTO in 2001.

Lost wages from the increasing trade deficit with China

Growing trade-related job displacement has several direct and indirect effects on workers' wages and incomes. The direct wage effects are a function of the wages foregone in jobs displaced by growing U.S. imports from China minus potential gains from the growth of jobs supported in export-producing industries and the wages available in alternative jobs in nontraded industries. (U.S. workers displaced from traded-goods production in manufacturing industries who find jobs in nontraded goods industries experience permanent wage losses, as discussed below). Scott (2013) estimates the gains and losses associated with direct changes in employment caused by growing U.S.–China trade

deficits between 2001 and 2011.[19] The key finding in that study is that jobs displaced by imports from China actually paid 17.0 percent more than jobs exporting to China: $1,021.66 per week in import-competing industries versus $872.89 per week in exporting industries (Scott 2013, 24, Table 9a). Standard trade theory assumes that economic integration leads to "gains from trade" as workers move from low-productivity jobs in import-competing industries into higher-productivity jobs in export-competing industries. However, this assumption is proven incorrect in Scott (2013), which showed that import-competing jobs pay better than alternative jobs in export-producing industries. Therefore, simple trade expansion which increases total trade, with no underlying change in the trade balance, will result in a *net loss* to workers as they move from higher-paying jobs in import-competing industries to lower-paying jobs in exporting industries.

Furthermore, jobs in both import-competing and exporting industries paid substantially more than jobs in nontraded industries, which pay $791.14 per week (Scott 2013, Table 9a, 24). Between 2001 and 2011, growing exports to China supported 538,000 U.S. jobs, but growing imports displaced 3,280,200 jobs, for a net loss of 2.7 million U.S. jobs (Scott 2013, Table 5, 13). Thus, not only did workers lose wages moving from import to export industries, but 2.7 million workers were displaced from jobs making $1,021.66 per week on average, and (if they were lucky enough to find jobs) were mostly pushed into jobs in nontraded industries paying an average of only $791.14 per week (a decline of 22.6 percent). In total, U.S. workers suffered a direct net wage loss of $37 billion per year (Scott 2013, 26, Table 9b) due to trade with China. But the direct wage losses are just the tip of the iceberg.

As shown by Josh Bivens in *Everybody Wins, Except for Most of Us* (Bivens 2008a, results updated in Bivens 2013), growing trade with China essentially puts all American workers without a college degree (roughly 100 million workers) in direct competition with workers in China (and elsewhere) making much less. He shows that trade with low-wage countries was responsible for 90 percent of the growth in the college wage premium since 1995 (the college wage premium is the percent by which wages of college graduates exceed those of otherwise equivalent high school graduates). The growth of China trade was responsible for more than half of the growth in the college wage premium in that period, Bivens finds. To put these estimates in macroeconomic terms, in 2011, trade with low-wage countries lowered annual wages by 5.5 percent—roughly $1,800 for all full-time, full-year workers without a college degree. To provide comparable economy-wide impact estimates, assume that 100 million workers without a college degree suffered total losses of $1,800 per year, which yields a total national loss of $180 billion.[20] Therefore, the indirect, macroeconomic losses to U.S. workers without college degrees caused by growing trade with low-wage nations were about five times as large as the direct impact of $37 billion in direct wage losses in 2011 from trade with China, and about 40 times as many workers were affected indirectly due to globalization's wage lowering effect (100 million) as were displaced by trade with China (2.7 million).[21] And China trade alone was responsible for about 56.8 percent of the increase in the overall college/non-college wage gap between 1995 and 2011.[22]

Additionally, Autor, Dorn, and Hanson estimate that rising exposure to low-cost Chinese imports lowers labor force participation and reduces wages in local labor markets; in

particular, they find that increased import competition has a statistically significant depressing effect on nonmanufacturing wages (Autor, Dorn, and Hanson 2012, abstract). This confirms the findings of Bivens (2008a, 2013). They also find that "transfer benefits payments for unemployment, disability, retirement, and healthcare also rise sharply in exposed labor markets" and that "for the oldest group (50–64), fully 84% of the decline in [manufacturing] employment is accounted for by the rise in nonparticipation, relative to 71% among the prime-age group and 68% among the younger group" (Autor, Dorn, and Hanson 2012, abstract, 25). Thus, Autor, Dorn, and Hanson find that more than two-thirds of all workers displaced by growing competition with Chinese imports dropped out of the labor force. These results are explained, in part, by the finding that "9.9% … of those who lose employment following an import shock obtain federal disability insurance benefits [Social Security Disability Insurance or SSDI benefits]." Additionally, "rising import exposure spurs a substantial increase in government transfer payments to citizens in the form of increased disability, medical, income assistance and unemployment benefits." Moreover, "these transfer payments vastly exceed the expenses of the [Trade Adjustment Assistance] TAA program, which specifically targets workers who lose employment due to import competition" (Autor, Dorn, and Hanson 2012, 25, 30). In Autor and Hanson (2014), the effects are totaled, and they find that "for regions affected by Chinese imports, the estimated dollar increase in per capita SSDI payments is more than 30 times as large as the estimated dollar increases in TAA payments."

Summing up the overall impact of the growing U.S.–China trade deficit on jobs and wages

The growing trade deficit with China has clearly reduced domestic employment in traded-goods industries, especially in the manufacturing sector, which has been pummeled by plant closings and job losses. Workers from the manufacturing sector displaced by trade have had particular difficulty securing comparable employment elsewhere in the economy. According to the most recent Bureau of Labor Statistics survey covering displaced workers (BLS 2016b), more than one-third (36.7 percent) of manufacturing workers displaced from January 2013 to December 2015 were still not working, including 21.7 percent who were not in the labor force, i.e., no longer even looking for work.

U.S. workers who were directly displaced by trade with China between 2001 and 2011 lost a collective $37.0 billion in wages as a result of accepting lower-paying jobs in nontraded industries or industries that export to China assuming, conservatively, that those workers are re-employed in nontraded goods industries (Scott 2013)[23]. Worse yet, growing competition with workers in China and other low-wage countries reduced the wages of all 100 million U.S. workers without a college degree, leading to cumulative losses of approximately $180 billion per year in 2011 (Bivens 2013, Scott 2015b). The lost output of unemployed workers, especially that of labor force dropouts, can never be regained and is one of the larger costs of trade-related job displacement to the economy as a whole.

Trade adjustment assistance (TAA) is a Department of Labor program to provide retraining and unemployment benefits to certain workers who were displaced by growing imports. However, new research suggests that significant shares of displaced workers are signing up for disability and retirement benefits, other government income assistance, and government medical benefits, in addition to temporary trade adjustment assistance. Many of these workers, such as those on disability and retirement, are permanently dropping out of the labor force, resulting in permanent income losses to themselves and the economy. TAA benefits represent only a tiny share of the costs of adjustment. Examining only those costs for which workers actually qualify for government benefits, Autor, Dorn, and Hanson (2012, Figure 7 at 32) find that unemployment and TAA benefits represent only 6.3 percent of the total benefit costs associated with a $1,000 increase in imports per worker in commuting zones, over the 1990–2007 period.[24] Given the low level of coverage of social safety net programs in the United States, versus other developed countries (such as the EU), actual adjustment costs for displaced workers are likely substantially larger than the actual U.S. benefits estimated by Autor, Dom, and Hanson.

Some economists and others in the trade debate have argued that job loss numbers extrapolated from trade flows are uninformative because aggregate employment levels in the United States are set by a broad range of macroeconomic influences, not just by trade flows.[25] However, while the trade balance is but one of many variables affecting aggregate job creation, it plays a large role in explaining structural change in employment, especially in the manufacturing sector. As noted earlier, between December 2001 and December 2015, 3.4 million U.S. manufacturing jobs were lost (BLS 2016c). The growth of the U.S. trade deficit with China was responsible for the displacement of 2.6 million manufacturing jobs in this period, or about 75.4 percent of manufacturing jobs lost. Thus, manufacturing job loss due to the growing trade deficit with China accounts for roughly three-fourths of all U.S. manufacturing jobs lost or displaced in this period.

The employment impacts of trade identified in this paper can be interpreted as the “all else equal” effect of trade on domestic employment. The Federal Reserve, for example, may decide to cut interest rates to make up for job losses stemming from deteriorating trade balances (or any other economic influence), leaving net employment unchanged. This, however, does not change the fact that trade deficits by themselves are a net drain on employment. Even if macroeconomic policy is adjusted to offset the negative impact of the growing trade deficit with China on total employment, the structure of production and employment in the United States has been negatively affected (Scott 2016a).

Many of the mechanisms that could offset employment losses caused by growing trade deficits are not operating in the current economic climate. The Federal Reserve policy interest rates are still quite low, and interest-rate-sensitive industries such as residential construction are not experiencing employment gains from lower rates.[26] In short, in today’s economy with its relatively high levels of workers not in the labor force, jobs displaced due to the trade deficit with China are much more likely to be actual economy wide losses than simply job reallocations.

Threats to national security

The rapid growth of U.S. imports of computer and electronic parts from China also represents a threat to national security because it is connected to the outsourcing of U.S. defense products, as explained by Brigadier General John Adams (2015). The outsourcing of the defense industry makes the United States vulnerable to disruption of supply chains for key missile and communications components. Outsourcing has also reduced the quality of military equipment: a congressional report found nearly 1 million counterfeit components in the supply chain for "critical" defense systems (Senate Armed Services Committee 2012). And outsourcing has eroded the capacity of the defense industrial base for cost innovation, knowledge generation, and support for domestic employment (Alliance for American Manufacturing 2016).

Threats to national wealth, savings, and income

Rising overall U.S. trade deficits with China and the world as a whole led to offsetting inflows of capital to finance these deficits. As a result, the United States net international investment position (NIIP) declined from -$2.3 trillion in 2001, before China joined the WTO, to $-7.2 trillion in 2015 (BEA 2016b). Growing U.S. trade deficits with China effectively transferred 3.4 million U.S. jobs to that country, and those deficits were financed by transferring trillions of dollars of U.S. wealth over the past fifteen years, largely to the People's Bank of China, as shown below.[27] Meanwhile, net U.S. borrowing, as reflected in the NIIP, has increased by $4.9 trillion in this period, more than trebling our net international debt (BEA 2016b).

Each year that the United States runs a trade deficit is a year that it must borrow from abroad to finance this excess of consumption over domestic production.[28] This is because of the relationship between trade flows, savings, and investment in the domestic and international economies (see text box, **"How countries running a trade deficit finance consumption and investment."**) This borrowing leads to growing foreign debt that must be paid, with interest (Bivens 2008). In 2015, the U.S. borrowing was roughly $1.3 billion per day.

Australia provides a good example of the consequences of such borrowing. In recent years, the Australian goods and services trade deficit has averaged around 2 percent of gross domestic product, yet Australia's total deficit of international credits over debits reached 6 percent of GDP.[29] The 4 percentage-point gap between the trade and total deficit was debt service (i.e., interest) paid on the borrowing to cover the previous year's accrued trade deficits.

Were Australia ever to achieve balanced trade on goods and services, it would have to pay interest on its accumulated foreign debt forever, or until those debts were paid off (by running trade surpluses). In this case, Australia would be required to generate an excess of

national production (income) in excess of consumption equal to at least four percent of GDP. This amounts to a tax on future generations that must be paid in order to pay for today's (and past) consumption in excess of production. There are no free lunches in the global economy.

This large income flow leaving Australia to pay interest on accumulated foreign debt should be a red flag for the future of the U.S. economy. The United States ran a trade surplus in nearly every year between 1946 and 1975, and by 1975 had become the largest net lender in the world.[30] The United States has run increasingly large trade deficits in every year since 1976, and has become the world's largest net debtor. Thus, trade deficits are associated with job losses, as noted above, and also with the need to making growing payments of national income in order to service growing levels of net foreign debt.[31]

Running trade deficits or surpluses has both benefits and costs for any given economy. Whether a country should run a trade surplus (and export capital) depends in part on its level of economic development. In general, large trade deficits and surpluses (relative to total global output), and large net capital flows, are destabilizing to the global economy and in most cases should be avoided.

Foreign capital inflows can destabilize the domestic economy, as they did in the great housing bubble of 2001 to 2007, as explained by former Federal Reserve chairman Ben Bernanke (2005) in his work on the "housing glut." Such bubbles (which have recurred several times in the past 40 years in the United States) are one reason why large, global trade imbalances are destabilizing. In these cases, the structure of the domestic economy has become "imbalanced," in the sense that the housing sector has become too large to be sustainable in long-run equilibrium, and the manufacturing sector too small to maintain the number of good, family-sustaining jobs needed to support working-class families.[32] The consequences in the case of the "housing glut" were unbelievably catastrophic—the largest economic recession since the great depression, resulting in more than a decade's worth of lost income and wages that will never be recovered by current or future citizens, workers, and families.

On the other hand, it is often appropriate for poor, developing countries to run trade deficits, which also generate capital inflows. Such countries are usually underdeveloped in part because of a shortage of invested capital. Rates of return on capital are typically much higher than in developed countries, and the returns to these societies of importing capital (if well managed) typically greatly exceed the costs of international borrowing. Thus, most development scholars and economists think that it is appropriate for developing countries to run trade deficits offset by small trade surpluses in developed countries, which can benefit from the higher rates of return on capital invested in poor countries, relative to advanced, developed economies.

China and other Asian economies that have pursued export-led growth strategies (such as Japan, South Korea, Singapore, Taiwan, Thailand, and Malaysia) have turned this economic model on its head. These countries have suppressed domestic consumption to generate excess domestic savings and large trade surpluses. These strategies are based, in large part, on currency manipulation, which as explained below involves making large

government investments in foreign assets (e.g., foreign exchange reserves) generating artificially undervalued currencies, resulting in growing trade surpluses. Thus, the growing trade and capital account surpluses accumulated by these countries are in essence, self-fulfilling strategies predicated on abuse of well-established norms of competitive market behavior and models of economic development.

How countries running a trade deficit finance consumption and investment

In a simple economy with no trade (that is, a closed economy), in order to grow, that economy needs investment dollars.[33] It gets them from savers, who put their savings in banks, which lend them out to investors. In this closed economy with no trade, savings equals investment, and investment is thus constrained by the level of savings in the domestic economy (Bernstein 2015, 127-129). In the language of economists,

(1) $S = I$

Where S is domestic savings and I equals domestic investment.

In an open economy (ignoring the role of government spending, G, and taxation, T, usually included in the standard model), domestic investment is no longer constrained by the level of domestic savings. In this model, all output is equal to income of the various factors of production in society (wages, profits, rent, and interest). In this economy, all income must be either consumed (C) or saved (S), so output (GDP) is just equal to income, (Y), with exports (X) and imports (M) representing the trade balance ($X - M$):

(2) GDP = $Y = C + I + X - M$

In this economy, all income must be either consumed or saved, so output (GDP) is just equal to income:

(3) $Y = C + S$

And, combining equations 2 and 3,

(4) $C + S = C + I + X - M$

And, subtracting C from each side of this equation yields and rearranging:

(5) $S + M = I + X$

(6) $I = S + (M - X)$

So, in an open economy, investment can be greater than domestic savings if imports exceed exports; that is, if that country is running a trade deficit. Likewise, if a country is running a trade deficit then investment must exceed savings, by the laws of nation income accounting. And capital must flow from countries running trade surpluses to countries running trade deficits.

In the real world, over the past 40 years, countries such as China have developed a huge savings surpluses, which are supported by large and growing trade surpluses. While these surpluses shrank in the wake of the Great Recession they have recovered and increased to record levels in recent years, as shown in Figure D, and by Setser (2016b and 2016d).

It's not an accident: Addressing the causes of trade-related job losses

The job and wage losses from the growing U.S. trade deficit with China—and the national security vulnerabilities—should be unacceptable to U.S. policymakers. Especially since this is a solvable problem: The increase in the U.S.–China trade deficit is caused by specific Chinese policies that U.S. policy can address.

Subsidies that fuel excess capacity and lead to dumping

Extensive government subsidies and the rapid growth of state-owned enterprises have generated a massive buildup of excess capacity in a range of Chinese industries. Excess capacity means that China's factories are churning out quantities of basic commodity products such as steel products, aluminum, machinery, rubber and plastics and stone, cement, glass, and solar panels that far exceed the demand for these products in China's domestic economy. To prop up these overcapacity industries, these products are sold in other markets at below market rates (dumping). The United States bears a uniquely large burden, suffering more than other countries from subsidized and dumped imports in these industries (Brun 2016, U.S.–China ESRC 2016, 105).

Much of this Chinese overcapacity has been developed by SOE's, which channel financial support to companies in these industries through state banks (U.S.–China ESRC 2016, 103). But direct support from the Chinese government in the form of subsidized prices for energy and natural resource inputs also plays a significant role (Haley 2008, 2009, 2012). The U.S.–China ESRC (U.S.–China ESRC 2016, Executive Summary 3) concludes that:

Rather than restructuring the state sector to reduce corporate debt and increase efficiency, the Chinese government continues to prop up nonviable companies with

government subsidies, discounted production inputs, and favorable lending from state banks. As a result, the SOEs remain the driving force behind key sectors of the Chinese economy despite incurring significant losses. Under President Xi, the Chinese government has not only expanded its control over SOEs, but also exerted its influence over private companies. By enhancing government oversight … Beijing is able to direct both private and public firms to promote state goals.

The proliferation of subsidies (along with currency manipulation, discussed in the next section) has for most of the past 15 years acted like a subsidy to all of China's exports and a tax on everything that China imports. These subsidies have contributed to the tremendous growth of excess capacity in steel and other primary product industries in that country (Price et al. 2010). Indeed, China has been found guilty of dumping in 759 cases (covering all products) between 1995 and 2014 (Fan 2015).

China's actions to prop up its steel industry serve as an example. China's steel production capacity increased tenfold from 2000, when it had roughly the same capacity as the United States, to 2014, when its production capacity reached 1.2 billion tons, while U.S. capacity remained largely unchanged at roughly 100 million tons (Ferriola 2016). China went from being a net steel importer to a net exporter of over 100 million tons of dumped and subsidized steel, worldwide, in 2015. U.S. steel producers absorbed net losses of $1.43 billion in the fourth quarter of 2015 and $233 million in the first quarter of 2016.[34] Domestic steel producers were forced to "reduce capital expenditures" and "shutter capacity and lay off employees," with nearly 19,000 U.S. steel and iron ore miners facing layoffs "as a result of Chinese overcapacity (U.S.–China ESRC 2016, 4, 110, 120).

Lax environmental laws that "subsidize" Chinese products

China has become one of the world's biggest polluters and much of this is due to increased emissions from steel and other industries. China operates as a dumping ground for carbon and other key air, water, and waste pollutants. China now produces more sulfur dioxide and carbon dioxide than any other country in the world. For example, China's steel industry now accounts for 50 percent of the world's production of carbon dioxide from steelmaking, and recent data show that on some days, one-quarter of the particulate matter in Los Angeles originates in China (Bailey et al. 2009).

China's air and water pollution standards for steel and energy (e.g., electricity) production are much less stringent than those in the United States. Its enforcement and financial penalties are largely ineffective. As a result, Chinese steel companies spend considerably less on pollution control equipment than U.S. companies. There is widespread evidence that capital expenditures for pollution control are much lower in China than in the United States. Overall, the Chinese steel industry is spending roughly three percent of its capital budget on pollution controls, much less than the 17 percent average of U.S. steel manufacturers (Bailey et al 2009, ix). As a result, Chinese steelmakers emit 20 times as much particulate matter per ton as U.S. steelmakers, five times as much sulfur dioxide, and roughly three times as much nitrogen oxide per ton.

The low levels of investment in pollution control equipment have contributed to China's growing strength in markets around the world. An economist in China's Ministry of Commerce told the *New York Times* that, regarding steel products, "the shortfall of environmental protection is one of the main reasons why our exports are cheaper (Bailey et al. 2009, vi)." Cheap energy, which is also subsidized (Haley 2009), was also cited as another reason for China's low steel prices.

Repression of labor rights

China extensively suppresses labor rights, which lowers production costs within China. A 2006 AFL-CIO study estimated that repression of labor rights by the Chinese government had lowered manufacturing wages of Chinese workers by between 47 percent and 85 percent (AFL-CIO, Cardin, and Smith 2006, 138).

Policies that block imports and foreign competition

Indirectly, China's broad network of subsidies and policy supports for favored companies and industries (discussed above) acts as substantial barriers to import penetration, putting international firms that wish to export to China at a substantial disadvantage.

For one, China imposes forced technology transfer on foreign firms wishing to invest in China and it engages in cyber-enabled theft of intellectual property (U.S.–China ESRC, Executive Summary vii).[35] Thus foreign firms are reluctant to do business in China for fear of endangering technology that is critical to their patents' proprietary technologies and sources of competitive edge in global markets.

China also blocks or discourages imports via import substitution policies. These policies impose tariffs, quotas and other direct restrictions on imports, and explicitly favor Chinese domestic producers of commodities that would otherwise be imported, reducing demand for U.S. exports.

China is also become less welcoming to foreign investors, and imposes many restrictions on their activities. Its anti-competitive laws prohibit foreign participation in broad sectors of the domestic economy and give preferences to domestic, Chinese companies (U.S.–China ESRC, Executive Summary vii). China has made it clear that it does not allow foreign competition to occur, via imports or foreign direct investment, in what it views as key sectors of its economy.

The crucial missing link of foreign direct investment and outsourcing

Proponents of trade deals such as the agreement to endorse China's admission to the World Trade Organization usually focus on the impacts of these deals on tariff and nontariff

barriers to trade.[36] China agreed to make major tariff reductions as a condition of entry into the WTO. President Clinton and many others argued that since U.S. tariff barriers were already low, the agreement would do more to increase U.S. exports to China than to reduce U.S. imports from China (Clinton 2000).

But proponents failed to anticipate the effect of China's entry on foreign direct investment (FDI) and outsourcing.

Foreign direct investment is an investment by a company or individual in one country that is made in business interests in another country. It can take the form of establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company.[37] Unlike portfolio investments, in which an investor merely purchases equities of foreign-based companies, foreign direct investment establishes effective control of, or at least substantial influence over, the decision making of a foreign business. (Investopedia 2017)

FDI has played a key role in the growth of China's manufacturing sector. China is the largest recipient of FDI of all developing countries (Xing 2010) and is the third-largest recipient of FDI over the past three decades, trailing only the United States and the United Kingdom. For many years, foreign-invested enterprises (both joint ventures and wholly owned subsidiaries) were responsible for roughly two-thirds of China's global trade surplus (Ministry of Commerce, China 2016). However, due to China's indigenous innovation policies and other measures that have pushed out foreign investors, often through forced takeovers and illegal theft of intellectual property, this share has fallen sharply to only one-third in 2015 (Ministry of Commerce, China 2016, Brachman 2015, Shi 2010). Nonetheless, outsourcing by U.S. entities—through foreign direct investment in factories that make goods for export to the United States—has played a key role in the shift of manufacturing production and jobs from the United States to China since China entered the WTO in 2001.

Failure to enact policies that would expand the Chinese market for U.S. goods

Another critically important promise made by the promoters of liberalized U.S.–China trade was that the United States would benefit because of increased exports to a large and growing consumer market in China. However, despite widespread reports of the rapid growth of the Chinese middle class, this growth has not resulted in a significant increase in U.S. consumer exports to China. The most rapidly growing exports to China are bulk commodities such as grains, scrap, and chemicals; intermediate products such as semiconductors; and producer durables such as aircraft and non-electrical machinery (see the discussion of Table 2 earlier in this paper, and Supplemental Table 5 at the end of this report). Furthermore, the increase in U.S. exports to China since 2001 has been overwhelmed by the growth of U.S. imports, as shown earlier in Table 1.

The proof of the absence of effective policies to increase Chinese demand for U.S. products is found in the low absolute increase in exports, relative to U.S. imports; in 2015 imports exceeded exports by more than 4:1, as noted above.

Currency manipulation and misalignment are the major causes of the trade deficit

Finally, misalignment of the U.S. dollar and the legacy of currency manipulation by China (and other countries) are major causes of the U.S. trade deficit and of manufacturing job loss. While some countries are still manipulating, as traditionally defined, China is not, and yet we are left with this massive overhang of a trade deficit. The Chinese yuan and other currencies of current and former manipulators are still substantially misaligned, and this hangover is a big cause of U.S. and global trade imbalances.

Recent EPI reports have explained how currency manipulation by China and other East Asian nations has led to rising trade surpluses by currency manipulators and thus global trade imbalances, hitting the United States particularly hard (Kimball and Scott 2014, Scott and Glass 2016). This section summarizes the key trends.

Global trade imbalances began to develop in the 1990s, increased steadily from 2000 to 2007, stabilized after the Great Recession in 2008, and have increased sharply since 2011 (Setser 2016b, 2016d). Between 1990 and 2010, the growth of global trade imbalances was largely driven by government currency manipulation, specifically by official purchases of foreign exchange reserves (FX) and other assets to drive up the value of foreign currencies relative to the currency manipulator's currency (Bergsten and Gagnon 2012, Figure 1).[38]

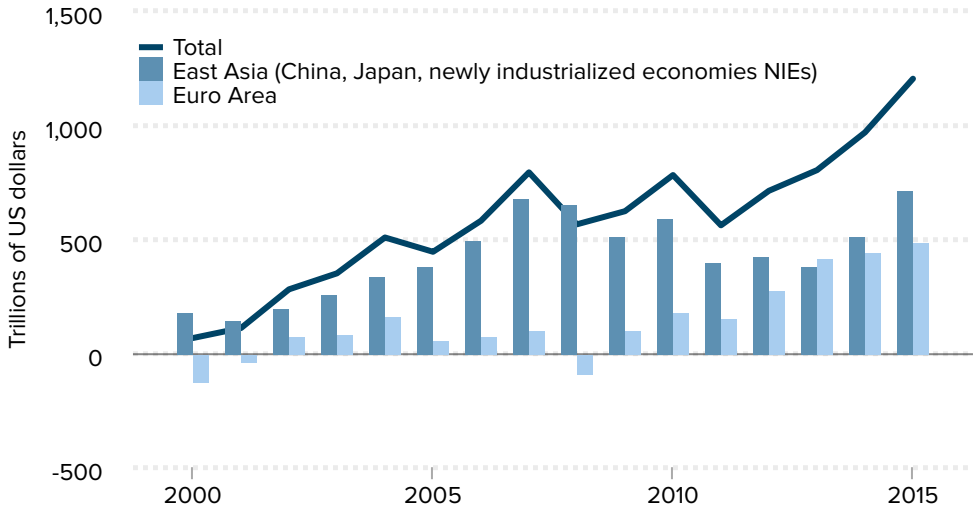
Figure D shows that the source of these imbalances, at least since 2000, were rising trade surpluses in East Asia and Europe (Setser 2016b and 2016d). It is important to note that these estimates are based on total current account balances, the broadest measure of trade in goods, services, income, and transfers. (A trade balance, by contrast, includes just trade in goods and services.) This measure is most widely accepted by economists as a measure of *global* trade imbalances. These imbalances have fallen hardest on the United States and the EU, as noted by Bergsten and Gagnon (2012).

Between 2000 and 2010, Asian countries maintained their surpluses through currency intervention (Bergsten and Gagnon 2012). The flip side of the trade surpluses of currency manipulators was the accumulation of a large "saving glut," as first noted by Ben Bernanke (2005). This savings glut was recycled to the United States and EU and helped fuel the rise of the housing crisis and bad debt that has lingered over the global economy for the past eight years.

Global trade imbalances rose sharply between 2011 and 2015. The combined current account surpluses of Europe and East Asian countries reached $1.2 trillion in 2015. For comparison purposes, the U.S. current account deficit was $463 billion in 2015 (BEA 2016b).[39] The U.S. goods trade deficit, which most directly impacts manufacturing and U.S.

Figure D

Europe and East Asia current account balances



Source: IMF (2016b)

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employment, rose from $198.4 billion in 1997 (the year before the Asian financial crisis), to 782.6 billion in 2015 (U.S. Census Bureau 2016d). China and other Asian currency manipulators began large, systematic interventions in currency markets in the wake of the 1997 Asian financial crisis, resulting in growing currency manipulation (and increasingly large currency undervaluations) and causing the rise of global trade and capital account imbalances after 2000, and continuing until the present time.

Further details on the composition of current account surpluses by county in 2015 are shown in **Table 6**. The countries with the largest surpluses, in terms of total dollars are China, Germany (by far the largest in the Euro area), Japan, and South Korea.[40] Viewed as a share of GDP, Singapore, Taiwan, Switzerland, the Netherlands, Germany, and South Korea have the largest surpluses.

The East Asian (and European) savings gluts have reappeared, as noted in a new report by Brad Setser (2016d). In Asia, these savings gluts are being fueled by extremely high domestic rates of savings. In China, the domestic savings rate is approaching 50 percent, well in excess of domestic investment.

As noted by Setser, it is now private capital outflows, rather than currency manipulation, that are driving up the dollar and leading to the same end result—growing U.S. trade deficits. The dollar has gained almost 25 percent, on a trade-weighted basis, since the end of 2013 as shown in **Figure E**. Overall currency intervention in Asia has declined in the past two years and was negative in 2015 (as shown in Setser 2016d, Figure 12), when China sold off $512.6 billion in foreign exchange reserves held by the People's Bank in order to prop up the value of the yuan (IMF 2016a).[41] Thus, the principal cause of global

Table 6

Current account, foreign exchange reserves and GDP of Asian and European countries, 2015 (billions of U.S. dollars)

Country	Current account (CA) balance	CA as share of GDP	GDP	Foreign exchange reserves
China	$330.6	3.00%	$11,181.6	$3,330.4
Hong Kong SAR	9.6	3.10%	309.2	358.7
South Korea	105.9	7.70%	1,377.9	358.5
Singapore	57.9	19.80%	292.7	245.7
Taiwan	76.2	14.60%	523.0	426.0
Japan	135.6	3.30%	4,124.2	1,179.5
Euro area	365.7	3.20%	11,597.5	245.6
Demark	20.7	7.00%	295.1	60.1
Sweden	25.9	5.20%	493.0	49.8
Switzerland	75.8	11.40%	664.0	560.6
Total	1203.9	3.90%	30,858.3	6,815.0
Addenda:				
EU founding countries				
Belgium	-0.2		454.3	
France	-4.8		2,420.2	
Germany	284.2	8.40%	3,365.3	
Italy	39.9	2.20%	1,815.8	
Luxembourg	3.2	5.50%	57.8	
Netherlands	64.4	8.60%	750.7	

Source: IMF (2016a and 2016b)

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trade imbalances is no longer currency *manipulation* (by governments), but currency *misalignment* (driven by private capital flows).

The U.S. trade deficit in manufactured goods jumped about $100 billion in 2014, in the wake of substantial increases in the value of the dollar in 2013 and 2014, which gained about 20 percent on a broad, trade-weighted basis (USITC 2016a and Figure E, above).[42] Additional dollar gains after the 2016 election can be expected to cause further increases in the U.S. trade deficit in 2017, putting downward pressure on output and employment in manufacturing, which lost 80,000 jobs between January and October of 2016 (BLS 2016c).

Previous research has shown that large holdings of foreign exchange and other dollar reserves do have a depressing effect on currency values (Bayoumi, Gagnon, and Saborowski 2014). Overvaluation of the U.S. dollar clearly reflects some combination of

Figure E

Trade-weighted U.S. dollar index, January 2007–November 2016

Note: This index measures the value of the U.S. dollar relative to other world currencies. The base index value is 100 in 1973.

Source: Author's analysis of Federal Reserve Board of Governors (2016)

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past and current currency manipulation and of market-driven dollar misalignment. A narrow focus on naming and blaming currency manipulators can distract from the larger question of dollar misalignment and steps needed to rebalance global trade.

In particular, China has been the largest and most important currency manipulator for most of the past 15 years, as indicated by the data in Table 1 in this report. However, China has intervened *heavily* to prop up the value of the yuan in the past year (in effect, leaning against the wind). Efforts to declare China a currency manipulator now will generate substantial controversy with few immediate benefits.

Policy responses to redress unfair trade and other causes of the U.S. China trade deficits

The agreement accepting China into the WTO failed to adequately address the harms addressed above or include any protections to maintain or improve labor or environmental standards. For all of these reasons, China's entry has further tilted the international economic playing field against U.S. domestic workers and firms and in favor of multinational companies from the United States and other countries, as well as state-owned and privately owned exporters in China. This shift has accelerated the global "race to the bottom" in wages and environmental quality and closed thousands of U.S. factories, decimating employment in a wide range of communities, states, and entire regions of the United States. U.S. national interests generating domestic production and jobs have

suffered while U.S. multinationals have enjoyed record profits on their foreign direct investments (Scott 2007, 2011).

Officials and policymakers have responded with important but limited actions. In September 2009, the Obama administration, in response to a petition filed by United Steelworkers (USW) under Section 421 of U.S. trade laws, announced that it would restrict imports of Chinese tires for three years under special safeguard measures, the first time since 2001 that these measures had been used (USTR 2009, and Alliance for American Manufacturing 2010).

In September 2010, United Steelworkers filed a Section 301 petition with the U.S. trade representative, accusing China of illegally stimulating and protecting producers of green technology exports, ranging from wind and solar energy products to advanced batteries and energy-efficient vehicles. Indeed, the U.S. trade deficit in clean energy products had more than doubled between 2008 and 2010, displacing more than 8,000 U.S. jobs in 2010 alone (Scott 2010). The 2010 USW petition detailed more than 80 Chinese laws, regulations, and practices that violate international trade agreements and have hurt U.S. clean energy manufacturing and green-technology industries.

In July 2012, the Obama administration filed a WTO complaint against China over its tariffs on large vehicles exported from the United States to China. This was the seventh complaint filed by the administration against China, and the previous six had all been successful (Scott 2012b).

In the current policy environment, the correct responses by Congress and the president should include enhanced enforcement of fair trade laws and treaty obligations (through anti-dumping, countervailing duty, and WTO case filings). The United States should develop and implement the government's capacity, perhaps housed in the U.S. Department of Commerce, to initiate anti-dumping, countervailing duty, and other unfair trade cases (currently allegedly aggrieved parties must initiate proceedings). The United States should also consider whether changes in the practice of, regulation of, or statue(s) governing fair trade enforcement are required (Stewart et al. 2014, 55–57).

The United States should also review existing measures of trade flows and indicators of actual or threatened injury to determine whether to pursue better early warning mechanisms and new and improved options for responding to import surges. The United States should also make overcapacity in China a priority bilateral concern, especially through reform of state-owned enterprises. In this regard, the United States may wish to consider initiating safeguard investigations under Section 201 of the Trade Act of 1974 in steel and other sectors subject to import surges resulting from massive overcapacity in China. The president and the U.S. trade representative, as well as relevant committees in the House and the Senate, can request such investigations (USITC 2016b).

The United States should also bring cases at the WTO against the unfair Chinese trade practices that have created massive excess capacity in its steel industry, and which have cost thousands of jobs and forced many of our steel mills to idle or close. The U.S. aluminum supply chain is also in crisis from China's excess capacity and trade violations, and more aggressive actions are needed to prevent layoffs. The United States should

bring a separate WTO case against China for its unfair trade practices in the aluminum industry.

In order to offset the unfair advantages conferred by China's weak pollution control regimes, the U.S. may need to consider imposing a border-adjustable fee on carbon emissions from energy-intensive industries. To be consistent with the WTO principal of national treatment, such fees would have to apply to both domestic and foreign producers, but should be based on actual or estimated pollutant emissions per unit of consumption. A carbon tax, which would fall more heavily on steel imported from China than on comparable domestic products, is a good example of such a fee.

Because of the threats posed by China's unfair trade policies to U.S. military supply chains in electronics, advanced materials supply, and other key sectors noted above (Adams 2015, Senate Armed Services Committee 2012), and because of the government thefts of commercial technology (Hickerson 2016), the U.S. government should consider barring China from all U.S. government procurement contracts. The Committee on Foreign Investment in the United States (U.S. Department of the Treasury 2016a) should prohibit all Chinese SOEs from foreign direct investment in U.S. manufacturing or high-tech companies. In addition, China should continue to be treated as a nonmarket economy in fair trade enforcement. The European Union is considering whether to formally recognize China as a "market economy," a move that would fundamentally change the way EU countries handle dumped exports under the World Trade Organization. With some EU officials reportedly in favor of unilaterally granting market economy status (MES) to China—and with the United States and other countries addressing the same question—it is important to recognize what the change would mean for WTO member economies. For example, an EU decision to unilaterally grant MES to China would put between 1.7 million and 3.5 million EU jobs at risk by curbing the ability to impose tariffs on dumped goods and thus allowing Chinese companies to undercut domestic production by flooding the EU with cheap goods (Scott 2015d). Finally, China should not be rewarded for its market distortions with a bilateral investment treaty.

Bilateral investment treaties (BITs) provide special sets of protections for U.S. foreign direct investors and for foreign investors in the United States (USTR 2016). U.S. Trade Representative Froman (2015) has been negotiating a BIT with China and claims that increased bilateral investment will create many benefits for the United States. However, as shown here, outsourcing by U.S. companies in China has generated massive job loss in the United States. In addition, recent research has shown that foreign direct investment in the United States has also increased U.S. trade deficits and job losses (Scott 2016c).

Policy responses to currency manipulation and misalignment

Currency manipulation violates the rules of the international trading system set out in the GATT (General Agreement on Tariffs and Trade) and WTO agreements (Stewart and Drake 2010). Joe Gagnon of the Peterson Institute for International Economics recommends that the rules of the WTO be changed to allow countries to impose tariffs on imports from

currency manipulators. Since changing the rules of the WTO requires unanimous consent of all members, "the main targets of currency manipulation—the United States and euro area—may have to play tough. One strategy would be to tax or otherwise restrict purchases of U.S. and euro area financial assets by currency manipulators." (Gagnon 2012 1). Such financial taxes would be "consistent with international law" (Gagnon 2011).

Over the past 10 years, there have been numerous attempts in Congress to enact policies to end illegal currency manipulation. Proposed actions against currency manipulation have included efforts to include "enforceable restrictions" on currency manipulation in the proposed Trans-Pacific Partnership (TPP). But the TPP did not include such rules (which, given the stakes of this issue was reason enough to oppose the entire deal). There have also been calls for the U.S. Treasury and the president to do more to name and penalize currency manipulators, under rules established in the Omnibus Foreign Trade and Competitiveness Act of 1988. These rules were strengthened under the Bennet Amendment to the Customs bill,[43] passed this year, but at best, these changes will only improve the process by which Treasury monitors currency manipulation. At worst, they will diffuse Congressional pressure to address currency manipulation and misalignment and their negative impacts on U.S. production, trade, and employment, and reduce the probability that these problems will be addressed by policymakers. New tools are needed to realign the dollar (Bergsten and Gagnon 2016, Hansen 2016).

The most effective tools available to offset both currency manipulation and market-driven misalignment are those that would directly intervene in currency markets. Several economists have recommended ways to do this. Joe Gagnon and his colleague Fred Bergsten at the Peterson Institute for International Economics have proposed that the United States and other deficit countries engage in countervailing currency intervention (CCI) by buying up large amounts of foreign assets denominated in the currencies of the surplus countries (Bergsten and Gagnon 2012). John Hansen (2016), another distinguished economist, has proposed the imposition of an adjustable "market access charge," a tax or fee on all capital inflows that would reduce the demand for dollar-denominated assets and hence the value of the currency. By revaluing the currencies of surplus countries, the U.S. trade deficit could be reduced by between $200 billion and $500 billion dollars, raising demand for U.S. exports. (Rebalancing the dollar would also help exports in the services and agriculture sectors.)

By reducing the U.S. trade deficit by between $200 billion and $500 billion within three years, full revaluation of the yuan and other undervalued Asian currencies would increase U.S. GDP by as much as $720 billion, add up to 5.8 million U.S. jobs, reduce the federal budget deficit by up to $266 billion per year, and increase net state and local fiscal resources by up to $101 billion per year (Scott 2014a). Revaluation would also help workers in China and other Asian countries by reducing inflationary overheating and increasing workers' purchasing power.

It would also benefit other countries. The undervaluation of the yuan has put the burden of global current account realignment pressures on other countries such as Australia, New Zealand, South Africa, and Brazil, whose currencies have also become overvalued with respect to those of China and other currency manipulators.

The Plaza Accord

In 1985, the U.S. was faced with a sizeable current account deficit and a substantially overvalued dollar. There was concern that growing U.S. trade deficits would become unsustainable, resulting in a dollar crash and "hard landing" (recession) for the domestic economy. The U.S. lost nearly 2 million manufacturing jobs between 1980 and 1985. This resulted in substantial pressure in Congress for administration action on trade and the dollar. A large number of pieces of "protectionist" trade legislation were proposed, especially during the spring and summer of 1985 (Scott 2009, 8).

The Plaza Accord might never have happened were it not for strong congressional pressure. One of the most important measures in Congress was proposed by Reps. Dan Rostenkowski (D-Ill.) and Richard A. Gephardt (D-Mo.) and Sen. Lloyd Bentsen (D-Texas). The measure would have imposed a 25 percent import surcharge on countries such as Japan, Brazil, South Korea, and Taiwan that maintained large trade surpluses with the United States.[44] The House version, H.R. 3035, was passed twice in the summer and fall of 1985.

On September 22, 1985, the United States announced that it had reached a "Plaza Accord" with other members of the G-5 group of finance ministers and central bank officials (representing the United States, Japan, Germany, France, and the United Kingdom) to head off congressional threats to impose trade restrictions, and in response to substantial pressure from other members of the G-5 and other leading industrial nations, who wished to head off the threat of large trade sanctions.

Over the next two years the dollar fell approximately 30 percent. Its fall was only halted by the Louvre Accord, in which the countries involved agreed to jointly intervene to halt the dollar's slide (Gagnon 2016). This case illustrates that the mere threat of broad trade sanctions can be sufficient to induce trading partners to agree on major currency realignment. It is also important to note that retaliation did not occur following the Plaza Accord. However, the relative sizes of U.S. trading partners are much larger now than in those much earlier cases, so it is difficult to accurately predict their responses to threats of trade sanctions.

Thus, Congressional pressure, as illustrated by the Bentsen-Rostenkowski-Gephart trade bill of 1985 can play an enormously important role in building international pressure and consensus on the need for arrangement to realign major currencies and end currency manipulation, as illustrated by the case of the Plaza Accord.[45]

Given recent increases in the current account surpluses of East Asia and European countries shown in Figure D above, and China's large role in those surpluses, the U.S. must maintain currency vigilance and perhaps even consider negotiating a new Plaza Accord to rebalance currencies and global trade.[46] This accord should also address excessive levels of savings in Asia, which are a primary cause of rising global trade imbalances. China and other East Asian nations need to reduce excessive levels of domestic savings to better align savings levels with domestic investment and government borrowing. The best ways to do this are to raise wages and to increase public spending on

pensions, health care, and other aspects of the safety net. This will both reduce private saving and increase domestic demand for both domestic and imported goods, reducing global trade imbalances.

Rebuilding manufacturing

Unfair trade, overcapacity, and currency manipulation and misalignment by China and countries in China's sphere are important because they have decimated employment in U.S. manufacturing industries. Between December 1997 (the beginning of the Asian financial crisis) and December 2014, the United States lost 5.3 million manufacturing jobs, nearly one-third of U.S. manufacturing employment (BLS 2016c). Meanwhile, over 85,000 manufacturing establishments disappeared between 1997 and 2014 alone (U.S. Census Bureau 2016b). The year 1997 was a watershed moment that immediately preceded the Asian financial crisis and the subsequent surge in Asian currency manipulation and the development of global trade imbalances.

Rebuilding manufacturing is important for a number of reasons. First, manufacturing provides good jobs with better wages and benefits for workers without a college degree, who make up nearly two-thirds of the domestic labor force. As of September 2015, average total compensation in manufacturing was nearly $8 more per hour (27.2 percent higher) than in the (mostly service) industries that have gained jobs since the beginning of the Great Recession (Scott 2016a).

In addition, manufacturing has an important footprint in the private economy. Although manufacturing was only responsible for 8.8 percent of total U.S. employment in 2014, and 12.1 percent of total gross domestic product (BLS 2016a, BLS 2016c, and BEA 2016a), the manufacturing footprint in the domestic economy is much larger (Scott 2015a). Manufacturing is a huge buyer of commodities and services from elsewhere in the economy. It generated $6.2 trillion in gross output (net sales) in 2014, more than one-third (35.6 percent) of U.S. GDP in that year, and 40.5 percent of private-sector economic output (BEA 2016a). In 2014, manufacturing supported approximately 17.4 million indirect jobs, in addition to the 12.2 million people directly employed, for a total of 29.6 million jobs directly and indirectly supported, more than one-fifth (21.3 percent) of total U.S. employment in 2014 (Scott 2015a, BLS 2016a, and BLS 2016c).

Manufacturing is also responsible for roughly 70 percent, or $270 billion, of all U.S. business research and development (as of 2013). Because of the high levels of R&D spending, and because of its capital intensity, manufacturing tends to have high rates of productivity growth. Multifactor labor productivity growth in manufacturing averaged 3.3 percent per year between 1997 and 2012. This was nearly one-third greater than in the private, nonfarm economy as a whole. Lastly, manufacturing led the way on trade with total exports of $1.36 trillion in manufactured goods—60.1 percent of all U.S. goods and services exported in 2015 (USITC 2016a and U.S. Census Bureau 2016d).

Rebuilding manufacturing can play a key role in eliminating excess unemployment and restoring broadly shared prosperity in the U.S. economy.[47] The manufacturing trade deficit

was $619 billion in 2015, or 3.4 percent of GDP (USITC 2016a, BEA 2016a). Eliminating it, primarily by ending currency manipulation and misalignment, could create up to 2.3 million manufacturing jobs alone—not counting the jobs created as manufacturing workers spend or the indirect jobs supported by manufacturing (Scott 2014a). But as this report notes, rebalancing currencies is just one of several important steps the United States must take to reduce its trade deficit and thus strengthen manufacturing. Estimates are not available for the overall impact of the proposed measures on manufacturing jobs but the effect would be sizable.

Manufacturing is still one of the most important buyers of services. That is why the value of "gross output" in manufacturing ($6.2 trillion in 2014) is so much larger than gross domestic product (or value added) in manufacturing, which was only $2.1 trillion in that year (BEA 2016a). Gross output is a measure of the value of final shipments from manufacturing, whereas GDP or value-added only includes the value of labor and capital directly employed by manufacturing firms (plus some taxes paid by manufacturers). Thus, manufacturing supports more workers throughout the economy (including those directly employed in manufacturing as well as those in supplier industries in commodities and services) than any other private industry in the country.

The size of the manufacturing sector will also directly affect the kind of service economy we want to have. Manufacturing firms are important buyers of high-wage, high-value business services such as law, accounting, programming, and other technical and managerial services. However, the services that have been growing most rapidly in the wake of the Great Recession of 2008–2009 have mostly been in low-wage industries such as restaurants and retail trade (Scott 2016a). Thus, creating a healthy manufacturing sector is critical to supporting the creation of good service-sector jobs.

Conclusion

The growing U.S. goods trade deficit with China has displaced millions of jobs in the United States and contributed heavily to the crisis in U.S. manufacturing employment, which has heightened over the last decade largely due to trade with China. Moreover, the United States is piling up foreign debt, losing export capacity, and facing a more fragile macroeconomic environment.

China and America are locked in destructive, interdependent economic cycles, and both can gain from rebalancing trade and capital flows.

For its part, China has become dependent on the U.S. consumer market for employment generation, suppressed the purchasing power of its own middle class with a weak currency, and, most importantly, now holds nearly $4 trillion in foreign exchange reserves instead of investing them in public goods that could benefit Chinese households (IMF 2016a). Meanwhile, net U.S. borrowing from the rest of the world increased by nearly $5 billion between 2001 and 2015, and net U.S. debt to the rest of the world more than tripled

Although economic growth in China has been rapid, it is unbalanced and unsustainable. China's vast purchases of foreign assets, intended to depress the value of its currency, have led to the overheating of its domestic economy, and inflation in China has accelerated rapidly. Growth in China slowed to 7.3 percent in the third quarter of 2014, and it is projected to slow further over the next five years (Schuman 2014). Its unfair trade policies—including its illegal subsidies of China's exports to the United States and the rest of the world in steel and other core industries, its overcapacity, and its repression of labor rights have suppressed wages, lead to increased dumping. China's economy is teetering on the edge between inflation and a growth slump, and a soft landing is nowhere in sight. China needs to rebalance its economy by becoming less dependent on exports and more dependent on domestic demand led by higher wages and infrastructure spending. It also needs to reduce excessive levels of domestic savings to better align savings levels with domestic investment and government borrowing. The best ways to do this are to raise wages and to increase public spending on pensions, health care, and other aspects of the safety net. This will reduce private saving and increase Chinese domestic demand for both domestic and imported goods, reducing China's trade deficits.

The effects on the United States of China's destructive policies are outlined in this report. To summarize, growing U.S. trade deficits with China have eliminated 3.4 million jobs between 2001 and 2015, including 1.3 million jobs lost since the beginning of the Great Recession in 2008. Nearly three-fourths of the jobs lost were in manufacturing. These losses are responsible for a substantial share of the 3.4 million U.S. manufacturing jobs lost in this era. These job losses have been extremely costly for the workers and communities hardest hit, as shown by other research cited here.

The U.S.–China trade relationship needs to undergo a fundamental change. Addressing unfair trade, weak labor, and environmental standards in China, and ending currency manipulation and misalignment should be our top trade and economic priorities with China. It is time for the United States to respond to the growing chorus of calls from economists, workers, businesses, and Congress (Scott 2014b) and take action to stop unfair trade and illegal currency manipulation by China and other countries.

About the author

Robert E. Scott joined the Economic Policy Institute in 1996 and is currently director of trade and manufacturing policy research. His areas of research include international economics, trade and manufacturing policies and their impacts on working people in the United States and other countries, the economic impacts of foreign investment, and the macroeconomic effects of trade and capital flows. He has published widely in academic journals and the popular press, including the *Journal of Policy Analysis and Management*, the *International Review of Applied Economics*, and the *Stanford Law and Policy Review*, as well as the *Los Angeles Times*, *Newsday*, *USA Today*, *The Baltimore Sun*, *The Washington Times*, and other newspapers. He has also provided economic commentary for a range of electronic media, including NPR, CNN, Bloomberg, and the BBC. He has a Ph.D. in economics from the University of California at Berkeley.

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Appendix: Methodology

The trade and employment analyses in this report are based on a detailed, industry-based study of the relationships between changes in trade flows and employment for each of approximately 195 individual industries of the U.S. economy, specially grouped into 45 custom sectors[48]and using the North American Industry Classification System (NAICS) with data obtained from the U.S. Census Bureau (2013) and the U.S. International Trade Commission (USITC 2016a).

The number of jobs supported by $1 million of exports or imports for each of 195 different U.S. industries is estimated using a labor requirements model derived from an input-output table developed by the BLS–EP (2014a).[49] This model includes both the direct effects of changes in output (for example, the number of jobs supported by $1 million in auto assembly) and the indirect effects on industries that supply goods (for example, goods used in the manufacture of cars). So, in the auto industry for example, the indirect impacts include jobs in auto parts, steel, and rubber, as well as service industries such as accounting, finance, and computer programming that provide inputs to the motor vehicle manufacturing companies. This model estimates the labor content of trade using empirical estimates of labor content and goods flows between U.S. industries in a given base year (an input-output table for the year 2001 was used in this study) that were developed by the U.S. Department of Commerce and the BLS–EP. It is not a statistical survey of actual jobs gained or lost in individual companies, or the opening or closing of particular production facilities (Bronfenbrenner and Luce (2004) is one of the few studies based on news reports of individual plant closings).

Nominal trade data used in this analysis were converted to constant 2005 dollars using industry-specific deflators (see next section for further details). This was necessary because the labor requirements table was estimated using price levels in that year. Data on real trade flows were converted to constant 2005 dollars using industry-specific price deflators from the BLS–EP (2014b). These price deflators were updated using Bureau of Labor Statistics producer price indexes (industry and commodity data; BLS 2016e). Use of constant 2005 dollars was required for consistency with the other BLS models used in this study.

Estimation and data sources

Data requirements

Step 1. U.S.–China trade data are obtained from the U.S. International Trade Commission DataWeb (USITC 2016a) in four-digit, three-digit, and two-digit NAICS formats. General imports and total exports are downloaded for each year.

Step 2. To conform to the BLS Employment Requirements tables (BLS–EP 2014a), trade data must be converted into the BLS industry classifications system. For NAICS-based data, there are 195 BLS industries. The data are then mapped from NAICS industries onto their respective BLS sectors.

The trade data, which are in current dollars, are deflated into real 2005 dollars using published price deflators from the BLS–EP (2014b) and the Bureau of Labor Statistics (2016e).

Step 3. Real domestic employment requirements tables are downloaded from the BLS–EP (2014a). These matrices are input-output industry-by-industry tables that show the employment requirements for $1 million in outputs in 2005 dollars. So, for industry *i* the a_{ij} entry is the employment indirectly supported in industry *i* by final sales in industry *j* and where *i=j*, the employment directly supported.

Analysis

Step 1. Job equivalents. BLS trade data are compiled into matrices. Let $[T_{2001}]$ be the 195×2 matrix made up of a column of imports and a column of exports for 2001. $[T_{2015}]$ is defined as the 195×2 matrix of 2015 trade data. Finally, $[T_{2008}]$ is defined as the 195×2 matrix of 2008 trade data. Define $[E_{2001}]$ as the 195×195 matrix consisting of the real 2001 domestic employment requirements tables. To estimate the jobs displaced by trade, perform the following matrix operations:

$$[J_{2001}]=[T_{2001}]\times[E_{2001}]$$

$$[J_{2008}]=[T_{2008}]\times[E_{2001}]$$

$$[J_{2015}]=[T_{2015}]\times[E_{2001}]$$

$[J_{2001}]$ is a 195×2 matrix of job displacement by imports and jobs supported by exports for each of 195 industries in 2001. Similarly, $[J_{2008}]$ and $[J_{2015}]$ are 195×2 matrices of jobs displaced or supported by imports and exports (respectively) for each of 195 industries in 2008 and 2015, respectively.

The employment estimates for retail trade, wholesale trade, and advertising were set to zero for this analysis. We assume that goods must be sold and advertised whether they are produced in the United States or imported for consumption.

To estimate jobs created/lost over certain time periods, we perform the following operations:

$[J_{nx01\text{-}15}]=[J_{2015}]-[J_{2001}]$

$[J_{nx01\text{-}08}]=[J_{2008}]-[J_{2001}]$

$[J_{nx08\text{-}15}]=[J_{2015}]-[J_{2008}]$

Step 2. State-by-state analysis. For states, employment-by-industry data are obtained from the Census Bureau's American Community Survey (U.S. Census Bureau 2013) data for 2011 and are mapped into 45 unique census industries and eight aggregated total and subtotals for a total of 53 sectors.[50] We look at job displacement from 2001 to 2015, so from this point, we use $[J_{nx01\text{-}15}]$. In order to work with 45 sectors, we group the 195 BLS industries into a new matrix, defined as $[Jnew_{01\text{-}15}]$, a 45×2 matrix of job displacement numbers. Define $[St_{2011}]$ as the 45×51 matrix of state employment shares (with the addition of the District of Columbia) of employment in each industry. Calculate:

$[Stj_{nx01\text{-}15}]=[St_{2011}]_T\,[Jnew_{01\text{-}15}]$

where $[Stj_{nx01\text{-}15}]$ is the 45×51 matrix of job displacement/support by state by industry. To get state total job displacement, we add up the subsectors in each state.

Step 3. Congressional district analysis

Employment by congressional district, by industry, by state is obtained from the ACS data from 2011, which for the first time use geographic codings that match the boundaries of the 113th Congress (elected in 2012). In order to calculate job displacement in each congressional district, we use each column in $[Stj_{nx01\text{-}15}]$, which represent individual state job-displacement-by-industry estimates, and define them as $[Stj_{01}]$, $[Stj_{02}]$, $[Stj_i]$…$[Stj_{51}]$, with *i* representing the state number and each matrix being 45×1.

Each state has *Y* congressional districts, so $[Cd_i]$ is defined as the 45x*Y* matrix of congressional district employment shares for each state. Congressional district shares are calculated thus:

$[Cdj_{01}]=[Stj_{01}]_T\,[Cd_{01}]$

$[Cdj_i]=[Stj_i]_T\,[Cd_i]$

$[Cdj_{51}]=[Stj_{51}]_T\,[Cd_{51}]$

where $[Cdj_i]$ is defined as the 45x*Y* job displacement in state *i* by congressional district by industry.

Congressional districts are estimated for the 115th Congress, which was elected in 2016 (Wikipedia 2016).

To get total job displacement by congressional district, we add up the subsectors in each congressional district in each state.

Endnotes

1. The World Trade Organization, which was created in 1994, was empowered to engage in dispute resolution and to authorize imposition of offsetting duties if its decisions were ignored or rejected by member governments. It expanded the General Agreement on Tariffs and Trade (GATT) trading system's coverage to include a huge array of subjects never before included in trade agreements, such as food safety standards, environmental laws, social service policies, intellectual property standards, government procurement rules, and more (Wallach and Woodall 2004).

2. Tables 1 and 2 report U.S. general imports (customs value) and total exports ("free alongside" or FAS value) to China. News reports from the U.S. Census Bureau and the Commerce Department usually emphasize general imports and total exports. The U.S. Internal Trade Commission (USITC) often refers to this as the "broad" measure of the trade balance, as opposed to the "narrow" measure, which relies on imports for consumption and domestic exports. For example, see USITC (2014). The key difference between these two measures is that total exports, as reported by the U.S. Census Bureau, include foreign exports (re-exports), i.e., goods produced in other countries and shipped through the United States, while domestic exports, as implied by the name, do not. The previous version of this report (Kimball and Scott 2014) relied on the narrow definition, using imports for consumption and domestic exports for the analysis. For 2015, imports for consumption were $479.1 billion, domestic exports were $107.7 billion, and the reported trade balance was $371.0 billion (rounding from actual data). The difference between using these two measures for our analysis was minimal (3.48 million jobs displaced in 2015 using the narrow measure compared with 3.44 million jobs lost using the broad measure) (USITC 2016a). All estimates for trade and jobs gained and lost for prior years have been revised based on the "broad" measure of the trade balance. Data for individual years, and for the change in net jobs displaced are reported in Table 1, in Figure A, and in all other exhibits in this report.

3. While some small proportion of goods imported from China represent a category of goods that may not be produced in the United States, and thus would be "noncompeting" goods, the model is an overall estimate of the net jobs displaced by the growing trade deficit. It is, in essence, an estimate of the jobs displaced by the growth of imports in excess of the growth of imports. Since virtually all U.S. imports from China were manufactured commodities, as shown in Table 2 later in this report, nearly all *could* have been produced in the United States, but for China's unfair trade and currency policies, and for its domestic "savings glut" (Setser 2016d).

4. The BLS updated its Employment Requirements Matrix in December 2015 (BLS-EP 2015)}, as it normally does every two years. Those revisions have not been taken into account in this update, as they will require a significant restructuring of the models used in this study (for example, there are 206 NAICS-based BLS industries in the 2015 BLS update, and only 195 in the previous version of the model used for this study). The models (including underlying population data from the American Community Survey used to analyze the geographic impacts of trade-related job loss) will be completely updated in 2017.

5. The macroeconomic model developed in Scott and Glass (2016) assumes that a 1.6 percent decrease in GDP would reduce total direct and indirect U.S. employment by roughly 1.4 percent.

There were, on average, 148.8 million people employed in the United States in 2015, thus yielding 2.1 million direct and indirect jobs displaced. The macroeconomic model also assumes a respending multiplier of 0.6, and yields a total of 3.4 million direct and indirect and respending jobs displaced by a trade deficit of this magnitude.

6. Scrap and used or second-hand goods are industries 192 and 193, respectively, in the BLS model, and there are no jobs supported or displaced by trade in these sectors, according to the BLS model.

7. Rising demand for U.S. scrap by China and other countries raised the cost of this commodity, driving up production costs for domestic producers that use scrap (such as steel mini-mills in the United States). These indirect effects show up in our model only when they lead to rising imports of steel and steel products from China, or lead to declining exports of products in these or related industries.

8. ATPs are an amalgamation of products from a variety of industries and subsectors within the broad NAICS-based categories shown in Table 2. They consist of 10 categories of products including biotechnology, life science, opto-electronics, information and communications, electronics, flexible manufacturing, advanced materials, aerospace, weapons, and nuclear technology (U.S. Census Bureau 2016a). In total ATP trade with the world, the United States had exports of $343.1 billion and imports of $434.9 billion in 2015, and a trade deficit of $91.8 billion. The United States had total ATP exports to China in 2015 of $34.2 billion and imports of $154.9 billion, and a trade deficit of $120.7 billion. This exceeded the overall U.S. ATP deficit of $91.8 billion. Thus, the United States had an ATP trade surplus with the rest of the world in 2015 of $28.9 billion (U.S. Census Bureau 2016c).

9. Data for trade in advanced technology products (ATP) by country are not available before 2002.

10. These results are derived from the trade and employment model described above, and in the Appendix to this report.

11. Deflators for many sectors in the computer and electronics parts industry fell sharply between 2001 and 2015 due to rapid productivity growth in those sectors. For example, the price index for computer and peripheral equipment manufacturing fell from 1,712.6 in 2001 to 523.1 in 2015, a decline of 69.5 percent (the price index is set at 1,000 in 2005, the base year). In order to convert from nominal to real values for 2015, for example, the nominal value is multiplied by 1,000/523.1 (the price index in year 2015) = 1.91. Thus, the real value of computers and peripheral products, a subset of the computer and electronic parts industry, in 2005 dollars is nearly twice as large as the nominal value in 2015. The real value of all computer and electronic parts imports in 2015 exceeded nominal values in that year by 41.1 percent. See Appendix, "Methodology," for source notes and deflation procedures used.

12. The ratio between the total change in U.S. imports to China and the total change in U.S. export to China is 381.0/96.8 = 3.94.

13. Data not shown in Table 2. Authors analysis based on the change in exports shown, by industry, and the multiplier referred to in the previous note (3.94).

14. The computer and electronic parts industry's share of all jobs lost ranged from 56.9 percent Illinois 6th District to 91.8 percent in California's 17th District, compared with the national average of 36.0 percent of jobs (Table 3). In these states the only exceptions, that is, districts where job losses were concentrated in industries other than computer and electronic parts, were California's 34th and 40th Districts, where jobs losses in the apparel industry were 69.0 percent and 62.1 percent, respectively, of total employment in each district (compared with the national average of 6.0 percent of jobs lost in the apparel industry, as shown in Table 3). Georgia is also one of the states that are host to one of the 20 hardest-hit congressional districts; Georgia's 14th congressional district lost a very large share of jobs in manufacturing, overall, 89.2 percent of all jobs lost, according to unpublished data available upon request. Nationally, manufacturing

accounted for a smaller, 74.3 share, of all jobs lost (Table 3). Overall, nearly two-thirds (65.6 percent) of jobs lost in Georgia's 14th district were in textile mills and textile product mills alone. North Carolina's 2nd district also suffered a large number of job losses in a wide range of manufacturing industries totaling 88.2 percent of job losses in that district. These losses were spread over a large number of industries including computer and peripheral equipment, apparel, textiles, and furniture manufacturing.

15. California's 17th congressional district is the home base of firms including Advanced Micro Devices, Apple Inc., Intel Corp, Yahoo, and eBay (Honda 2016).

16. The term "major manufacturing sector" refers here to employment by 3-digit NAICS manufacturing industries. The computer and electronic parts sector lost 1,238,200 of the 3.4 million U.S. manufacturing jobs lost between December 2001 and December 2015 (BLS 2016c), more than six times as many jobs as were lost as in apparel, the next largest, hardest hit, 3-digit manufacturing industry. Trade-related job losses in these industries shown in Table 3, above, reflect both potential jobs displaced by the growth of imports (which represents domestic consumption that could have been supplied by domestically produced goods) and by the failure of exports to grow, resulting in large trade deficits in these products.

17. In earlier research, Autor, Dorn, and Hanson "conservatively estimate" that growing "Chinese import competition … imply a supply-shock driven net reduction in U.S. manufacturing employment of 548 thousand workers between 1990 and 2000, and a further reduction of 982 thousand workers between 2000 and 2007." They note further that these results are based on microeconomic research "exploiting cross-market variation in import exposure" (Autor, Dorn, and Hanson 2012, 19–20, abstract).

These estimates are conservative, for several reasons, as noted by the authors. They fail to account for the overall macroeconomic impacts of growing U.S. trade deficits with China, including the direct and indirect effects of growing China trade deficits on U.S. employment, as noted by Acemoglu et al. (2014). As shown in Table 3, the growing U.S. goods trade deficit with China displaced 2.6 million total manufacturing jobs between 2001 and 2015, and an additional 886,200 nonmanufacturing jobs. Thus, approximately 0.35 nonmanufacturing jobs were displaced for each manufacturing job displaced.

Differences in parameter estimates notwithstanding, it is important to note that Autor, Dorn, and Hanson (2012), confirm that growing Chinese import competition is responsible for the displacement of approximately 1.5 million U.S. manufacturing jobs from 1990 to 2007, generally confirming the results of current and earlier EPI research.

18. Acemoglu et al. (2014) examine the impacts of U.S.–China trade from 1999 to 2011. The U.S. trade deficit with China increased from $68.7 billion in 1999 to $83.1 billion in 2001 to $295.2 billion in 2011 (U.S. Census Bureau 2016e). Thus, 93.6 percent of the growth of the U.S. trade deficits with China in the 1999–2001 period occurred after China entered the WTO in 2001.

19. These estimates are not updated in this report.

20. This macroeconomic estimate is developed here, and is not included in Bivens (2013).

21. The $180 billion in income is redistributed to college-educated workers in the top third of the labor force, and to owners of capital. Bivens and Mishel (2015, Figure C) found that for the period of 1973–2014, the loss in the labor share of income was responsible for 8.9 percentage points of the gap between net productivity and real median hourly compensation (a measure of the growth in inequality in this period).

22. Between 1995 and 2011, growing trade with China was responsible for 51.6 percent of the increase in the college/non-college wage gap in the United States in this period (Bivens 2013, Table 1), 57.1 percent of this wage gap. Thus, China is responsible for a sizeable majority (56.8 percent) of the overall impact of less-developed country (LDC) trade on the non-college wage gap in this period. This analysis decomposes the overall increase in the wage gap (4.8 percentage points), the share attributable to LDC trade, and the share of LDC trade accounted for by China.

23. This analysis refers to the wage impacts of net jobs lost due to the growth of the U.S.–China trade deficit between 2001 and 2011. It includes average wage gains in the 538,000 jobs supported by increased employment in export industries, less net wage losses in the 3.2 million jobs displaced by increased imports, assuming that all of the 2.7 million net displaced workers are rehired and receive average earnings in jobs in nontraded goods industries (Scott 2013, Table 9a). It is conservative in the sense that it assumes that all of the net displaced workers are rehired in jobs in nontraded goods industries; it excludes the wage losses absorbed by those displaced workers who are not reemployed (for example, the 36.7 percent of displaced workers in manufacturing who were not reemployed at all, as estimated in the BLS Displaced Worker Survey (BLS 2016b).

24. Autor, Doran, and Hanson (2012) use an analytic technique that compares employment in import sensitive industries in various geographic areas, at a fairly disaggregated level (roughly, cities or counties), referred to in their research as "commuting zones." They use these zones and data on imports in each region over the study period to do their statistical analysis.

25. One frequent criticism of trade and employment studies is that the growth of imports does not displace domestic production, and thus the claim is that such imports do not actually cost jobs. In addition, some assert that if imports from China fell, they would be replaced by imports from some other low-wage country (see, for example, U.S.–China Business Council 2011). However, important new empirical research by Autor, Dorn, and Hanson (2012, 4) has shown that "increased exposure to low-income country imports is associated with rising unemployment, decreased labor-force participation, and increased use of disability and other transfer benefits, as well as with lower wages." The bottom line is that "trade creates new jobs in exporting industries and destroys jobs when imports replace the output of domestic firms. Because *trade deficits* have risen over the past decade, more jobs have been displaced by imports than created by exports" (Bivens 2008b, 1).

26. The most important interest rate directly controlled by the Federal Reserve is the short-term Federal Reserve federal funds rate (FFR). The FFR influences longer term, 2, 5, 10, and 30 year interest rates, but those are more strongly influenced by economic forces such as inflationary expectations and growth rates. Long-term interest rates remained very low throughout 2016 (Federal Reserve Board of Governors 2017).

27. Overall capital flows into and out of the United States are determined by equal and offsetting flows on the current account, as reported in U.S. International Transactions Accounts (the Balance of Payments, BEA 2016b). The current account is the sum of the balance of trade (goods and services exports less imports), net income from abroad, and net current transfers. The cumulative U.S. goods trade deficit with China during the post-WTO era (2001–2015) was $3.5 trillion (USITC 2016a) which was 46.3 percent, or nearly half, of the cumulative U.S. current account deficit in this period (BEA 2016b).

The current account is the broadest measure of goods, services, and income flows. It is widely viewed by most economists as the best overall indicator of the net effect of international exchange on the impacts of the U.S. and foreign economies. As shown below, trade (and current account) flows are inherently linked, through the mechanism of national income accounting.

Running a trade deficit or surplus will both help and hurt domestic and foreign economies. Which forces are more important depend on the levels of output, savings, and investment in domestic and foreign economies, as discussed in the text, below.

The NIIP is also influenced, over time, by changes in exchange rates and by changes in the market values of U.S. assets (e.g., stocks, bonds, foreign direct investment) invested abroad, and in the values of foreign assets invested in the United States.

28. In this model production generates income (GDP), which must be either saved or spent. For any particular country (in an open economy), if consumption exceeds production, Y-C is less than 0 (negative), so that country is running a trade deficit, like the United States for the past 40+ years. Likewise, it must import savings to finance that consumption.

29. The gap between total credits and debits referred to here is the total current account deficit. The current account is a measure of total goods, services, and net income flows (where payments include international interest, profits, and other transfer payments, such as wages and government foreign aid). In the Australian case these income flows are dominated by interest and profits payments.

30. The only exceptions to this trend occurred in 1953, 1972, and 1974, when the U.S. ran small trade deficits.

31. There are, however, some possible offsets to job losses from trade flows. As the trade deficit grows, capital flows back into the domestic economy, as shown above. These inflows increase the supply of funds available for U.S. businesses and households to borrow. This drives down the price of borrowing (interest rates), just as an increase in supply in any other market drives down prices. Lower interest rates spur job growth in interest-sensitive industries (like housing); and these can offset some of the job losses from trade (Bivens 2008a).

32. Manufacturing employs a larger share of non-college educated workers than other shares of the economy, and wages and benefits (total compensation) earned by these workers is well above the national average for such workers (Scott 2016a).

33. Both households and firms can be savers in this model. We are essentially ignoring the corporate segment of the economy here, or assuming that corporate savings is under the control of households, who are the ultimate owners of all capital.

34. Steel is a huge industry and very price sensitive, hence it is not unusual to have big differences in losses from one quarter to the next. One trade case (of which there were several decided in this period) can have a large impact on prices and revenues (gross and net).

35. U.S. Steel recently filed an unusual unfair trade claim under section 337 of the trade act, which is usually invoked in cases involving patent and copyright infringement. In this case, U.S. steel is alleging, among other violations, that "theft of trade secrets" took place "based on allegation the Chinese government hacked into the computers of U.S. Steel," and used trade secrets to "price-fix" (at artificially low prices) and to use the resulting information to circumvent existing anti-dumping and countervailing duty orders (Hickerson 2016).

36. China's admission to the WTO was endorsed by the United States in domestic legislation that offered China permanent normal trade relations status.

37. In international investment surveys, a controlling interest in a foreign direct investment is defined as any investment which secures control of 10 percent or more of the outstanding stock of a foreign company or subsidiary.

38. Government purchases and holdings of foreign assets in Sovereign Wealth Funds (SWFs) also drive up the demand for the dollar and other foreign currencies. Bergsten and Gagnon (2012) include estimates of additions to SWFs in their analysis. China, Japan, and South Korea all hold significant amounts of national savings in SWFs (SWFI 2016).

39. The U.S. goods trade deficit was $762.5 billion in 2015, and the goods and services deficit was $500.4 billion (U.S. Census Bureau 2016d).

40. China has reported a rapidly growing services trade deficit in recent years, which is associated with large and growing deficits on its tourism accounts, resulting in reduced estimates of China's current account surplus. Brad Setser (2016a) has argued that this appears to reflect accounting problems. He concludes that there is growing reason to think that the goods surplus may now be the more accurate measure of China's impact on the global economy. China's goods surplus reached $600 billion in 2015 (IMF 2016a).

41. Some countries have continued to intervene in foreign exchange markets, including Taiwan and Switzerland, as shown in the most recent U.S. Department of the Treasury (2016b) report on the foreign exchange policies of major U.S. trading partners. Setser (2016c) has argued that there is some evidence of Korean intervention as well.

42. Increases in the value of the dollar in 2013 and 2014 were caused by a growing gap between growth rates in the United States and Europe (where many countries experience growth slowdowns or slipped back into recession), an increase in the Federal Reserve's policy interest rate (the short-term federal funds rate) in 2015, and by anticipated future increases in U.S. interest rates. These changes increased the attractiveness of investments in the United States, relative to the EU and other countries, resulting in rising demand for the U.S. dollar.

43. Title VII of the Trade Enforcement and Trade Facilitation Act of 2016, Title VII "Engagement on Currency Exchange Rate and Economic Policies," mandates a series of new actions on exchange rate policy that the president and the secretary of the treasury must pursue (Congress.gov 2016).

44. Bentsen, Rostenkowski, and Gephardt (1985). These measures were introduced in the 99th Congress on July 17 and July 18, 1985, respectively.

45. See also the role played by the Nixon temporary import surcharge in the broad currency realignment of 1971 (Scott 2009, 5-10)

46. As reported in note 40, above, China's goods trade surplus reached $600 billion in 2016, and was responsible for about one half of the global current account imbalances shown in Figure D, above. The next largest national current account surplus (Germany) was less than one-half as large as China's, as shown in Table 6, above.

47. There are many ways to measure hidden unemployment. One of the broadest is the estimate of prime age (25- to 54-year-old) workers who are employed, known as the employment-to-population ratio (EPOP), and to use these data to estimate maximum total employment. This ratio peaked in April 2000 at 81.5 percent of the civilian non-institutional population. This ratio fell in November 2016 to 77.9 percent (EPI 2016). There were about 126,000,000 workers of this age group in the population in that month (BLS 2016d). Of those, around 98,200,000 were employed. If EPOP had recovered to its 2000 peak, total employment in this group would have reached roughly 102,700,000 workers. Thus, an additional 4.5 million workers could potentially be drawn into employment if sufficient jobs could be created, even without lowering unemployment.

48. A previous edition of this research used data for 56 industries provided by the ACS (Scott 2012a). The BLS–EP consolidated several industries, including textiles and apparel, which required us to

consolidate data for these industries in our ACS state and congressional district models. Other "not elsewhere classified" industries were consolidated with other industries (e.g., "miscellaneous manufacturing") or deleted (e.g., in the case of "not specified metal industries") to update and refine the crosswalk from BLS–EP to ACS industries. As a result of these consolidations, there are 45 industries in the ACS dataset used for this study.

49. The model includes 195 NAICS industries. The trade data include only goods trade. Goods trade data are available for 85 commodity-based industries, plus software, waste and scrap, used or second-hand merchandise, and goods traded under special classification provisions (e.g., goods imported from and returned to Canada; small, unclassified shipments). Trade in scrap, used, and second-hand goods has no impact on employment in the BLS model. Some special classification provision goods are assigned to miscellaneous manufacturing.

50. The Census Bureau uses its own table of definitions of industries. These are similar to NAICS-based industry definitions, but at a somewhat higher level of aggregation. For this study, we developed a crosswalk from NAICS to Census industries, and used population estimates from the ACS for each cell in this matrix.

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Supplemental tables

Supplemental Table 1

Net U.S. jobs displaced due to the goods trade deficit with China, by state, 2001–2015 (ranked by net jobs displaced)

Rank	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as a share of state employment
1	*California*	589,100	16,426,700	3.59%
2	*Texas*	321,300	11,455,100	2.80%
3	*New York*	191,500	8,959,000	2.14%
4	*Illinois*	149,400	5,926,900	2.52%
5	*Pennsylvania*	136,700	5,853,300	2.34%
6	*North Carolina*	131,100	4,195,800	3.12%
7	*Florida*	128,100	8,101,900	1.58%
8	*Ohio*	121,500	5,213,500	2.33%
9	*Georgia*	104,200	4,193,800	2.48%
10	*Massachusetts*	101,700	3,284,700	3.10%
11	*New Jersey*	99,100	4,152,500	2.39%
12	*Michigan*	93,600	4,191,900	2.23%
13	*Minnesota*	89,100	2,728,900	3.27%
14	*Wisconsin*	79,100	2,819,500	2.81%
15	*Indiana*	78,600	2,934,500	2.68%
16	*Virginia*	69,600	3,860,100	1.80%
17	*Tennessee*	69,500	2,784,500	2.50%
18	*Oregon*	65,400	1,710,300	3.82%
19	*Arizona*	64,700	2,688,000	2.41%
20	*Colorado*	62,100	2,492,400	2.49%
21	*Washington*	59,900	3,118,000	1.92%
22	*South Carolina*	50,700	1,968,900	2.58%
23	*Missouri*	50,700	2,742,100	1.85%
24	*Alabama*	48,000	1,981,100	2.42%
25	*Kentucky*	46,000	1,838,400	2.50%
26	*Maryland*	46,000	2,894,600	1.59%
27	*Connecticut*	38,400	1,742,500	2.20%
28	*Oklahoma*	32,600	1,681,800	1.94%
29	*Iowa*	29,900	1,538,800	1.94%
30	*Utah*	29,700	1,260,800	2.36%

Supplemental Table 1 (cont.)

Rank	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as a share of state employment
31	*Arkansas*	27,600	1,235,800	2.23%
32	*Mississippi*	24,200	1,181,300	2.05%
33	*New Hampshire*	24,000	684,800	3.50%
34	*Kansas*	22,300	1,389,000	1.61%
35	*Louisiana*	21,800	1,973,900	1.10%
36	*Idaho*	18,300	684,900	2.67%
37	*Nevada*	16,700	1,204,900	1.39%
38	*Nebraska*	14,800	943,600	1.57%
39	*Rhode Island*	14,000	511,200	2.74%
40	*New Mexico*	13,700	869,800	1.58%
41	*Maine*	12,900	643,100	2.01%
42	*West Virginia*	10,800	748,600	1.44%
43	*Vermont*	8,800	327,300	2.69%
44	*Hawaii*	6,800	629,500	1.08%
45	*South Dakota*	6,500	415,600	1.56%
46	*Delaware*	6,100	420,400	1.45%
47	*Montana*	4,800	480,000	1.00%
48	*North Dakota*	3,500	370,800	0.94%
49	*District of Columbia*	3,100	310,600	1.00%
50	*Alaska*	3,100	344,300	0.90%
51	*Wyoming*	2,300	290,000	0.79%
*Total**		3,443,400	140,399,600	2.45%

Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

Economic Policy Institute

Supplemental Table 2

Net U.S. jobs displaced due to the goods trade deficit with China, by state, 2001–2015 (sorted alphabetically)

Rank (by jobs displaced as a share of total)	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as a share of state employment
19	*Alabama*	48,000	1,981,100	2.42%
50	*Alaska*	3,100	344,300	0.90%
20	*Arizona*	64,700	2,688,000	2.41%
25	*Arkansas*	27,600	1,235,800	2.23%
2	*California*	589,100	16,426,700	3.59%
17	*Colorado*	62,100	2,492,400	2.49%
27	*Connecticut*	38,400	1,742,500	2.20%
42	*Delaware*	6,100	420,400	1.45%
48	*District of Columbia*	3,100	310,600	1.00%
38	*Florida*	128,100	8,101,900	1.58%
18	*Georgia*	104,200	4,193,800	2.48%
46	*Hawaii*	6,800	629,500	1.08%
12	*Idaho*	18,300	684,900	2.67%
14	*Illinois*	149,400	5,926,900	2.52%
11	*Indiana*	78,600	2,934,500	2.68%
31	*Iowa*	29,900	1,538,800	1.94%
36	*Kansas*	22,300	1,389,000	1.61%
15	*Kentucky*	46,000	1,838,400	2.50%
45	*Louisiana*	21,800	1,973,900	1.10%
30	*Maine*	12,900	643,100	2.01%
37	*Maryland*	46,000	2,894,600	1.59%
6	*Massachusetts*	101,700	3,284,700	3.10%
26	*Michigan*	93,600	4,191,900	2.23%
4	*Minnesota*	89,100	2,728,900	3.27%
29	*Mississippi*	24,200	1,181,300	2.05%
34	*Missouri*	50,700	2,742,100	1.85%
47	*Montana*	4,800	480,000	1.00%
40	*Nebraska*	14,800	943,600	1.57%
44	*Nevada*	16,700	1,204,900	1.39%

Supplemental Table 2 (cont.)

Rank (by jobs displaced as a share of total)	State	Net jobs displaced	State employment (in 2011)	Jobs displaced as a share of state employment
3	*New Hampshire*	24,000	684,800	3.50%
21	*New Jersey*	99,100	4,152,500	2.39%
39	*New Mexico*	13,700	869,800	1.58%
28	*New York*	191,500	8,959,000	2.14%
5	*North Carolina*	131,100	4,195,800	3.12%
49	*North Dakota*	3,500	370,800	0.94%
24	*Ohio*	121,500	5,213,500	2.33%
32	*Oklahoma*	32,600	1,681,800	1.94%
1	*Oregon*	65,400	1,710,300	3.82%
23	*Pennsylvania*	136,700	5,853,300	2.34%
9	*Rhode Island*	14,000	511,200	2.74%
13	*South Carolina*	50,700	1,968,900	2.58%
41	*South Dakota*	6,500	415,600	1.56%
16	*Tennessee*	69,500	2,784,500	2.50%
8	*Texas*	321,300	11,455,100	2.80%
22	*Utah*	29,700	1,260,800	2.36%
10	*Vermont*	8,800	327,300	2.69%
35	*Virginia*	69,600	3,860,100	1.80%
33	*Washington*	59,900	3,118,000	1.92%
43	*West Virginia*	10,800	748,600	1.44%
7	*Wisconsin*	79,100	2,819,500	2.81%
51	*Wyoming*	2,300	290,000	0.79%
*Total**		3,443,400	140,399,600	2.45%

Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

Economic Policy Institute

Supplemental Table 3

Net U.S. jobs displaced due to the goods trade deficit with China, by congressional district, 2001–2015 (ranked by net jobs displaced)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
1	*California*	17	60,900	346,100	17.60%
2	*California*	18	49,500	344,500	14.37%
3	*California*	19	39,400	324,000	12.16%
4	*Texas*	31	34,700	323,000	10.74%
5	*Oregon*	1	32,500	377,200	8.62%
6	*California*	15	27,600	336,400	8.20%
7	*Texas*	3	21,900	371,200	5.90%
8	*Massachusetts*	3	20,600	355,400	5.80%
9	*California*	52	17,600	350,100	5.03%
10	*Georgia*	14	17,400	290,700	5.99%
11	*Illinois*	6	17,200	355,600	4.84%
12	*Texas*	10	17,100	342,600	4.99%
13	*California*	34	16,700	309,400	5.40%
14	*Minnesota*	1	16,600	348,200	4.77%
15	*California*	45	16,400	354,400	4.63%
16	*California*	40	16,300	280,500	5.81%
17	*Texas*	2	15,600	364,600	4.28%
18	*Minnesota*	2	15,500	358,300	4.33%
19	*California*	14	15,400	364,000	4.23%
20	*Minnesota*	3	14,900	353,800	4.21%
21	*New York*	18	14,900	332,100	4.49%
22	*Massachusetts*	2	14,800	356,500	4.15%
23	*California*	48	14,500	352,600	4.11%
24	*Massachusetts*	4	14,200	374,800	3.79%
25	*Texas*	17	14,200	329,300	4.31%
26	*Texas*	32	14,100	360,900	3.91%
27	*Colorado*	2	14,000	384,600	3.64%
28	*North Carolina*	13	13,900	349,900	3.97%
29	*Arizona*	5	13,800	317,900	4.34%
30	*Texas*	18	13,800	306,400	4.50%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
31	*Massachusetts*	5	13,500	387,400	3.48%
32	*New Jersey*	7	13,300	377,100	3.53%
33	*North Carolina*	6	13,300	341,800	3.89%
34	*North Carolina*	10	13,300	324,000	4.10%
35	*Texas*	24	13,300	388,600	3.42%
36	*North Carolina*	2	13,200	303,800	4.34%
37	*Illinois*	8	12,900	366,300	3.52%
38	*New Hampshire*	2	12,800	332,200	3.85%
39	*California*	49	12,500	299,700	4.17%
40	*Colorado*	4	12,500	344,100	3.63%
41	*California*	39	12,400	332,000	3.73%
42	*North Carolina*	8	12,400	301,700	4.11%
43	*California*	46	12,200	314,400	3.88%
44	*Arizona*	9	12,100	360,300	3.36%
45	*Indiana*	3	12,000	327,000	3.67%
46	*Oregon*	3	11,900	383,300	3.10%
47	*Texas*	25	11,900	302,200	3.94%
48	*Wisconsin*	5	11,900	370,600	3.21%
49	*California*	35	11,800	284,800	4.14%
50	*Texas*	7	11,700	376,300	3.11%
51	*California*	12	11,600	399,400	2.90%
52	*North Carolina*	5	11,500	324,500	3.54%
53	*California*	13	11,400	340,200	3.35%
54	*Kentucky*	6	11,400	335,400	3.40%
55	*Wisconsin*	6	11,300	353,600	3.20%
56	*New Hampshire*	1	11,200	352,600	3.18%
57	*Alabama*	5	11,100	311,900	3.56%
58	*Illinois*	11	11,100	347,300	3.20%
59	*Minnesota*	6	11,000	348,700	3.15%
60	*Wisconsin*	3	11,000	353,500	3.11%
61	*Illinois*	10	10,900	324,800	3.36%
62	*Illinois*	14	10,900	351,000	3.11%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
63	***California***	7	10,800	313,200	3.45%
64	***Georgia***	7	10,600	312,500	3.39%
65	***New Jersey***	5	10,600	356,100	2.98%
66	***New York***	25	10,600	335,400	3.16%
67	***Indiana***	8	10,500	329,300	3.19%
68	***Texas***	12	10,400	337,500	3.08%
69	***Texas***	33	10,400	283,900	3.66%
70	***Indiana***	2	10,300	317,800	3.24%
71	***Washington***	1	10,300	332,300	3.10%
72	***New Jersey***	11	10,200	358,800	2.84%
73	***North Carolina***	4	10,200	350,900	2.91%
74	***Ohio***	14	10,200	349,700	2.92%
75	***California***	37	10,100	335,600	3.01%
76	***Idaho***	1	10,100	329,900	3.06%
77	***Mississippi***	1	10,100	305,600	3.30%
78	***California***	30	10,000	358,200	2.79%
79	***California***	38	10,000	313,300	3.19%
80	***Massachusetts***	6	10,000	372,000	2.69%
81	***New Jersey***	8	10,000	371,000	2.70%
82	***Wisconsin***	1	10,000	342,500	2.92%
83	***New York***	19	9,900	327,300	3.02%
84	***North Carolina***	12	9,900	319,800	3.10%
85	***Georgia***	6	9,800	361,200	2.71%
86	***Illinois***	9	9,800	347,200	2.82%
87	***Iowa***	1	9,800	392,300	2.50%
88	***North Carolina***	9	9,800	371,400	2.64%
89	***Ohio***	7	9,800	326,800	3.00%
90	***South Carolina***	3	9,700	264,500	3.67%
91	***Wisconsin***	8	9,700	362,800	2.67%
92	***Illinois***	5	9,600	397,600	2.41%
93	***South Carolina***	4	9,600	301,000	3.19%
94	***Tennessee***	5	9,600	353,400	2.72%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
95	***Texas***	26	9,500	368,300	2.58%
96	***California***	44	9,400	270,600	3.47%
97	***Oklahoma***	1	9,400	361,900	2.60%
98	***Pennsylvania***	15	9,400	343,800	2.73%
99	***Michigan***	2	9,300	315,900	2.94%
100	***Minnesota***	5	9,300	352,000	2.64%
101	***Pennsylvania***	6	9,300	362,300	2.57%
102	***Pennsylvania***	8	9,300	357,800	2.60%
103	***Tennessee***	4	9,300	314,500	2.96%
104	***Washington***	3	9,300	284,500	3.27%
105	***California***	4	9,200	294,200	3.13%
106	***Illinois***	4	9,200	326,600	2.82%
107	***Ohio***	4	9,200	317,900	2.89%
108	***Virginia***	10	9,200	376,400	2.44%
109	***Arizona***	6	9,100	366,000	2.49%
110	***California***	33	9,100	364,200	2.50%
111	***New York***	2	9,100	357,800	2.54%
112	***South Carolina***	5	9,100	275,200	3.31%
113	***California***	27	9,000	332,200	2.71%
114	***Pennsylvania***	3	9,000	317,700	2.83%
115	***California***	32	8,900	293,800	3.03%
116	***New Jersey***	6	8,900	353,600	2.52%
117	***Ohio***	5	8,900	334,200	2.66%
118	***Ohio***	16	8,900	355,600	2.50%
119	***Wisconsin***	7	8,900	338,400	2.63%
120	***Alabama***	4	8,800	262,900	3.35%
121	***Indiana***	6	8,800	311,900	2.82%
122	***New Jersey***	9	8,800	338,500	2.60%
123	***New York***	1	8,800	343,300	2.56%
124	***New York***	7	8,800	322,200	2.73%
125	***Ohio***	13	8,800	320,400	2.75%
126	***Vermont***	Statewide	8,800	327,300	2.69%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
127	***Kansas***	3	8,700	370,300	2.35%
128	***Kentucky***	3	8,700	333,300	2.61%
129	***Michigan***	11	8,700	342,100	2.54%
130	***New York***	12	8,700	418,800	2.08%
131	***Tennessee***	7	8,700	285,800	3.04%
132	***Texas***	6	8,700	348,800	2.49%
133	***Arkansas***	3	8,600	327,000	2.63%
134	***Kentucky***	2	8,600	317,100	2.71%
135	***Pennsylvania***	18	8,600	345,000	2.49%
136	***California***	42	8,500	307,000	2.77%
137	***Colorado***	6	8,500	369,600	2.30%
138	***Connecticut***	5	8,500	348,300	2.44%
139	***Georgia***	3	8,500	285,800	2.97%
140	***Georgia***	9	8,500	284,600	2.99%
141	***Iowa***	2	8,500	373,400	2.28%
142	***Ohio***	8	8,500	328,800	2.59%
143	***Wisconsin***	2	8,500	390,000	2.18%
144	***North Carolina***	11	8,400	295,400	2.84%
145	***Pennsylvania***	12	8,400	331,900	2.53%
146	***California***	43	8,300	302,800	2.74%
147	***Connecticut***	3	8,300	352,700	2.35%
148	***Connecticut***	4	8,300	343,000	2.42%
149	***Idaho***	2	8,300	355,000	2.34%
150	***Massachusetts***	8	8,300	375,600	2.21%
151	***New York***	22	8,300	320,200	2.59%
152	***Virginia***	9	8,300	298,400	2.78%
153	***Washington***	7	8,300	380,000	2.18%
154	***California***	28	8,200	359,900	2.28%
155	***Florida***	8	8,200	283,400	2.89%
156	***Michigan***	10	8,200	308,700	2.66%
157	***Minnesota***	4	8,200	336,000	2.44%
158	***Missouri***	2	8,200	378,600	2.17%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
159	***Pennsylvania***	4	8,200	342,900	2.39%
160	***Texas***	21	8,200	361,200	2.27%
161	***California***	47	8,100	327,600	2.47%
162	***California***	53	8,100	342,700	2.36%
163	***Massachusetts***	9	8,100	352,300	2.30%
164	***Michigan***	3	8,100	315,300	2.57%
165	***California***	29	8,000	303,700	2.63%
166	***Georgia***	11	8,000	340,900	2.35%
167	***Utah***	3	8,000	311,200	2.57%
168	***Tennessee***	3	7,900	297,000	2.66%
169	***California***	26	7,800	325,900	2.39%
170	***California***	50	7,800	296,200	2.63%
171	***Colorado***	1	7,800	384,400	2.03%
172	***Indiana***	9	7,800	339,400	2.30%
173	***Oregon***	5	7,800	326,700	2.39%
174	***Pennsylvania***	10	7,800	312,500	2.50%
175	***Pennsylvania***	16	7,800	327,700	2.38%
176	***Pennsylvania***	17	7,800	312,600	2.50%
177	***Utah***	4	7,800	331,500	2.35%
178	***Wisconsin***	4	7,800	308,000	2.53%
179	***California***	25	7,700	302,700	2.54%
180	***Indiana***	4	7,700	328,500	2.34%
181	***New York***	24	7,700	327,300	2.35%
182	***Oklahoma***	4	7,700	350,900	2.19%
183	***Colorado***	5	7,600	315,900	2.41%
184	***New York***	23	7,600	324,600	2.34%
185	***Pennsylvania***	5	7,600	316,800	2.40%
186	***Pennsylvania***	7	7,600	339,700	2.24%
187	***Tennessee***	1	7,600	297,600	2.55%
188	***Florida***	23	7,500	339,900	2.21%
189	***Maryland***	8	7,500	400,100	1.87%
190	***Michigan***	6	7,500	310,400	2.42%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
191	***Michigan***	8	7,500	330,800	2.27%
192	***New York***	27	7,500	337,800	2.22%
193	***Oregon***	4	7,500	309,000	2.43%
194	***Alabama***	3	7,400	274,600	2.69%
195	***Colorado***	7	7,400	362,500	2.04%
196	***Indiana***	5	7,400	357,700	2.07%
197	***Texas***	9	7,400	326,400	2.27%
198	***Arkansas***	2	7,300	336,300	2.17%
199	***Illinois***	17	7,300	311,700	2.34%
200	***Indiana***	7	7,300	312,200	2.34%
201	***Michigan***	9	7,300	326,100	2.24%
202	***Tennessee***	6	7,300	304,500	2.40%
203	***Florida***	13	7,200	309,200	2.33%
204	***Florida***	22	7,200	332,000	2.17%
205	***Minnesota***	7	7,200	328,700	2.19%
206	***Missouri***	7	7,200	337,400	2.13%
207	***Rhode Island***	2	7,200	260,300	2.77%
208	***California***	5	7,100	326,800	2.17%
209	***Maryland***	6	7,100	363,200	1.95%
210	***New Jersey***	12	7,100	352,400	2.01%
211	***Pennsylvania***	13	7,100	339,000	2.09%
212	***Utah***	2	7,100	305,700	2.32%
213	***Arizona***	7	7,000	282,300	2.48%
214	***Illinois***	16	7,000	330,800	2.12%
215	***Kentucky***	1	7,000	284,800	2.46%
216	***New York***	17	7,000	341,400	2.05%
217	***Ohio***	10	7,000	312,800	2.24%
218	***Pennsylvania***	11	6,900	329,300	2.10%
219	***Texas***	35	6,900	318,200	2.17%
220	***Virginia***	5	6,900	316,100	2.18%
221	***California***	20	6,800	302,500	2.25%
222	***Indiana***	1	6,800	310,600	2.19%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
223	***Rhode Island***	1	6,800	250,900	2.71%
224	***Texas***	22	6,800	352,500	1.93%
225	***Utah***	1	6,800	312,400	2.18%
226	***Connecticut***	1	6,700	349,800	1.92%
227	***Kentucky***	4	6,700	333,500	2.01%
228	***New Jersey***	4	6,700	326,400	2.05%
229	***New Mexico***	1	6,700	311,900	2.15%
230	***Ohio***	12	6,700	359,500	1.86%
231	***Tennessee***	8	6,700	299,200	2.24%
232	***Virginia***	7	6,700	364,600	1.84%
233	***Washington***	9	6,700	341,400	1.96%
234	***Connecticut***	2	6,600	348,600	1.89%
235	***New Jersey***	1	6,600	339,200	1.95%
236	***Ohio***	6	6,600	292,300	2.26%
237	***Ohio***	9	6,600	315,000	2.10%
238	***Pennsylvania***	9	6,600	304,800	2.17%
239	***Texas***	30	6,600	292,300	2.26%
240	***Virginia***	11	6,600	400,900	1.65%
241	***Illinois***	3	6,500	319,500	2.03%
242	***Missouri***	8	6,500	298,500	2.18%
243	***North Carolina***	1	6,500	291,800	2.23%
244	***Ohio***	1	6,500	332,300	1.96%
245	***Ohio***	15	6,500	336,400	1.93%
246	***South Carolina***	7	6,500	269,400	2.41%
247	***South Dakota***	1	6,500	415,600	1.56%
248	***Alabama***	6	6,400	318,400	2.01%
249	***Arkansas***	4	6,400	295,100	2.17%
250	***California***	11	6,400	324,200	1.97%
251	***Maine***	1	6,400	340,400	1.88%
252	***Maine***	2	6,400	302,700	2.11%
253	***Michigan***	4	6,400	286,300	2.24%
254	***Missouri***	3	6,400	370,000	1.73%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
255	***Pennsylvania***	14	6,400	323,200	1.98%
256	***Texas***	4	6,400	299,300	2.14%
257	***Texas***	5	6,400	300,800	2.13%
258	***Virginia***	6	6,400	339,900	1.88%
259	***Arizona***	8	6,300	301,700	2.09%
260	***California***	31	6,300	292,200	2.16%
261	***Florida***	12	6,300	283,200	2.22%
262	***Illinois***	18	6,300	337,500	1.87%
263	***Massachusetts***	7	6,300	369,800	1.70%
264	***New York***	3	6,300	336,700	1.87%
265	***New York***	21	6,300	309,200	2.04%
266	***Ohio***	3	6,300	333,000	1.89%
267	***South Carolina***	2	6,300	305,600	2.06%
268	***Tennessee***	9	6,300	305,300	2.06%
269	***Minnesota***	8	6,200	303,400	2.04%
270	***New Jersey***	10	6,200	310,700	2.00%
271	***New York***	20	6,200	357,600	1.73%
272	***Texas***	29	6,200	292,900	2.12%
273	***Delaware***	Statewide	6,100	420,400	1.45%
274	***Georgia***	4	6,100	311,700	1.96%
275	***Georgia***	5	6,100	318,100	1.92%
276	***Maryland***	4	6,100	384,100	1.59%
277	***Michigan***	7	6,100	299,100	2.04%
278	***Missouri***	5	6,100	345,300	1.77%
279	***New Jersey***	3	6,100	344,200	1.77%
280	***Tennessee***	2	6,100	327,200	1.86%
281	***Texas***	8	6,100	309,200	1.97%
282	***Iowa***	3	6,000	390,800	1.54%
283	***Massachusetts***	1	6,000	341,000	1.76%
284	***New York***	10	6,000	360,300	1.67%
285	***Ohio***	2	6,000	323,600	1.85%
286	***Texas***	16	6,000	281,300	2.13%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
287	***Washington***	10	6,000	291,300	2.06%
288	***California***	41	5,900	271,900	2.17%
289	***Georgia***	10	5,900	287,400	2.05%
290	***Illinois***	15	5,900	316,500	1.86%
291	***Missouri***	6	5,900	355,900	1.66%
292	***New York***	5	5,900	336,200	1.75%
293	***New York***	6	5,900	327,000	1.80%
294	***New York***	26	5,900	327,700	1.80%
295	***Oklahoma***	5	5,900	348,800	1.69%
296	***California***	6	5,800	288,300	2.01%
297	***Nevada***	2	5,800	309,400	1.87%
298	***Oregon***	2	5,800	314,200	1.85%
299	***Virginia***	4	5,800	327,900	1.77%
300	***Alabama***	2	5,700	276,900	2.06%
301	***Florida***	7	5,700	322,500	1.77%
302	***Florida***	25	5,700	326,000	1.75%
303	***Kansas***	2	5,700	339,900	1.68%
304	***Nebraska***	1	5,700	321,700	1.77%
305	***Nebraska***	2	5,700	316,300	1.80%
306	***Illinois***	2	5,600	278,200	2.01%
307	***New York***	14	5,600	341,800	1.64%
308	***Georgia***	12	5,500	278,200	1.98%
309	***Georgia***	13	5,500	312,800	1.76%
310	***Iowa***	4	5,500	382,300	1.44%
311	***New York***	16	5,500	323,600	1.70%
312	***Virginia***	1	5,500	352,400	1.56%
313	***Arizona***	2	5,400	299,200	1.80%
314	***Maryland***	1	5,400	342,300	1.58%
315	***Arkansas***	1	5,300	277,400	1.91%
316	***California***	1	5,300	260,300	2.04%
317	***California***	2	5,300	323,100	1.64%
318	***California***	10	5,300	277,200	1.91%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
319	***Maryland***	3	5,300	369,500	1.43%
320	***Missouri***	1	5,300	331,500	1.60%
321	***Florida***	27	5,200	313,600	1.66%
322	***Michigan***	12	5,200	313,800	1.66%
323	***Mississippi***	3	5,200	303,900	1.71%
324	***New York***	11	5,200	317,500	1.64%
325	***New York***	13	5,200	317,200	1.64%
326	***Florida***	14	5,100	320,700	1.59%
327	***Illinois***	7	5,100	298,500	1.71%
328	***New York***	9	5,100	324,900	1.57%
329	***Ohio***	11	5,100	275,200	1.85%
330	***Oklahoma***	2	5,100	290,300	1.76%
331	***Pennsylvania***	1	5,100	273,300	1.87%
332	***Virginia***	8	5,100	423,700	1.20%
333	***Maryland***	5	5,000	368,200	1.36%
334	***Michigan***	14	5,000	257,700	1.94%
335	***North Carolina***	7	5,000	315,400	1.59%
336	***South Carolina***	6	5,000	253,500	1.97%
337	***Texas***	1	5,000	297,700	1.68%
338	***Texas***	27	5,000	305,600	1.64%
339	***Illinois***	1	4,900	290,200	1.69%
340	***Maryland***	2	4,900	351,700	1.39%
341	***Michigan***	1	4,900	290,200	1.69%
342	***Michigan***	5	4,900	264,800	1.85%
343	***Missouri***	4	4,900	324,900	1.51%
344	***New York***	8	4,900	292,700	1.67%
345	***Florida***	20	4,800	302,100	1.59%
346	***Georgia***	2	4,800	251,200	1.91%
347	***Illinois***	12	4,800	301,000	1.59%
348	***Mississippi***	4	4,800	304,900	1.57%
349	***Montana***	Statewide	4,800	480,000	1.00%
350	***New York***	4	4,800	342,500	1.40%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
351	***Virginia***	2	4,800	339,800	1.41%
352	***California***	51	4,700	258,600	1.82%
353	***Florida***	4	4,700	329,900	1.42%
354	***Florida***	21	4,700	316,800	1.48%
355	***Maryland***	7	4,700	315,700	1.49%
356	***Washington***	5	4,700	291,500	1.61%
357	***Florida***	16	4,600	276,100	1.67%
358	***New Mexico***	3	4,600	284,800	1.62%
359	***Florida***	15	4,500	304,200	1.48%
360	***Michigan***	13	4,500	230,700	1.95%
361	***New Jersey***	2	4,500	324,400	1.39%
362	***Oklahoma***	3	4,500	329,900	1.36%
363	***South Carolina***	1	4,500	299,800	1.50%
364	***West Virginia***	1	4,500	258,700	1.74%
365	***Alabama***	7	4,400	253,500	1.74%
366	***California***	24	4,400	323,500	1.36%
367	***Colorado***	3	4,400	331,400	1.33%
368	***Florida***	10	4,400	331,500	1.33%
369	***Illinois***	13	4,400	326,600	1.35%
370	***Texas***	36	4,400	291,900	1.51%
371	***Washington***	8	4,400	318,000	1.38%
372	***Florida***	24	4,300	293,400	1.47%
373	***Florida***	26	4,300	335,600	1.28%
374	***Hawaii***	1	4,300	330,100	1.30%
375	***Virginia***	3	4,300	320,100	1.34%
376	***Florida***	5	4,200	284,000	1.48%
377	***Florida***	6	4,200	283,200	1.48%
378	***Georgia***	8	4,200	272,700	1.54%
379	***Alabama***	1	4,100	283,000	1.45%
380	***California***	9	4,100	275,300	1.49%
381	***Florida***	18	4,100	284,000	1.44%
382	***Kansas***	1	4,100	345,900	1.19%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
383	***Louisiana***	6	4,100	367,800	1.11%
384	***Mississippi***	2	4,100	266,900	1.54%
385	***Nevada***	3	4,100	336,500	1.22%
386	***Texas***	13	4,100	309,000	1.33%
387	***Texas***	20	4,100	311,400	1.32%
388	***Texas***	23	4,100	289,700	1.42%
389	***Washington***	2	4,100	318,900	1.29%
390	***Louisiana***	4	4,000	311,100	1.29%
391	***Pennsylvania***	2	3,900	273,100	1.43%
392	***Texas***	14	3,900	303,300	1.29%
393	***Arizona***	1	3,800	264,900	1.43%
394	***Florida***	2	3,800	301,500	1.26%
395	***Kansas***	4	3,800	332,900	1.14%
396	***Louisiana***	1	3,800	354,000	1.07%
397	***New York***	15	3,800	255,900	1.48%
398	***West Virginia***	2	3,800	266,900	1.42%
399	***Arizona***	3	3,700	262,200	1.41%
400	***Louisiana***	3	3,700	328,100	1.13%
401	***North Carolina***	3	3,700	305,600	1.21%
402	***Texas***	11	3,700	308,800	1.20%
403	***Texas***	19	3,700	310,700	1.19%
404	***Arizona***	4	3,600	233,500	1.54%
405	***Kentucky***	5	3,600	234,300	1.54%
406	***Florida***	9	3,500	317,200	1.10%
407	***North Dakota***	Statewide	3,500	370,800	0.94%
408	***Washington***	6	3,500	275,500	1.27%
409	***Georgia***	1	3,400	286,100	1.19%
410	***Nebraska***	3	3,400	305,600	1.11%
411	***Nevada***	1	3,400	284,700	1.19%
412	***Nevada***	4	3,400	274,300	1.24%
413	***California***	8	3,300	235,500	1.40%
414	***Texas***	15	3,300	280,900	1.17%

Supplemental Table 3 (cont.)

Rank	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
415	***Louisiana***	2	3,200	329,000	0.97%
416	***Alaska***	Statewide	3,100	344,300	0.90%
417	***DC***	Statewide	3,100	310,600	1.00%
418	***Florida***	1	3,100	303,900	1.02%
419	***Florida***	11	3,100	217,400	1.43%
420	***Florida***	19	3,000	265,200	1.13%
421	***Texas***	28	3,000	266,300	1.13%
422	***California***	3	2,900	286,600	1.01%
423	***California***	22	2,900	289,600	1.00%
424	***Florida***	3	2,900	277,000	1.05%
425	***Louisiana***	5	2,900	283,900	1.02%
426	***California***	36	2,700	251,900	1.07%
427	***Texas***	34	2,700	242,200	1.11%
428	***Washington***	4	2,600	284,500	0.91%
429	***Hawaii***	2	2,500	299,400	0.84%
430	***West Virginia***	3	2,500	223,000	1.12%
431	***California***	23	2,400	274,100	0.88%
432	***New Mexico***	2	2,400	273,100	0.88%
433	***Wyoming***	Statewide	2,300	290,000	0.79%
434	***California***	16	2,100	244,900	0.86%
435	***Florida***	17	1,800	248,700	0.72%
436	***California***	21	600	243,800	0.25%
Total*			3,443,400	140,399,600	2.45%

Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

Economic Policy Institute

Supplemental Table 4

Net U.S. jobs displaced due to the goods trade deficit with China, by congressional district, 2001–2015 (sorted alphabetically by state)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
379	***Alabama***	1	4,100	283,000	1.45%
300	***Alabama***	2	5,700	276,900	2.06%
194	***Alabama***	3	7,400	274,600	2.69%
120	***Alabama***	4	8,800	262,900	3.35%
57	***Alabama***	5	11,100	311,900	3.56%
248	***Alabama***	6	6,400	318,400	2.01%
365	***Alabama***	7	4,400	253,500	1.74%
416	***Alaska***	Statewide	3,100	344,300	0.90%
393	***Arizona***	1	3,800	264,900	1.43%
313	***Arizona***	2	5,400	299,200	1.80%
399	***Arizona***	3	3,700	262,200	1.41%
404	***Arizona***	4	3,600	233,500	1.54%
29	***Arizona***	5	13,800	317,900	4.34%
109	***Arizona***	6	9,100	366,000	2.49%
213	***Arizona***	7	7,000	282,300	2.48%
259	***Arizona***	8	6,300	301,700	2.09%
44	***Arizona***	9	12,100	360,300	3.36%
315	***Arkansas***	1	5,300	277,400	1.91%
198	***Arkansas***	2	7,300	336,300	2.17%
133	***Arkansas***	3	8,600	327,000	2.63%
249	***Arkansas***	4	6,400	295,100	2.17%
316	***California***	1	5,300	260,300	2.04%
317	***California***	2	5,300	323,100	1.64%
422	***California***	3	2,900	286,600	1.01%
105	***California***	4	9,200	294,200	3.13%
208	***California***	5	7,100	326,800	2.17%
296	***California***	6	5,800	288,300	2.01%
63	***California***	7	10,800	313,200	3.45%
413	***California***	8	3,300	235,500	1.40%
380	***California***	9	4,100	275,300	1.49%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
318	***California***	10	5,300	277,200	1.91%
250	***California***	11	6,400	324,200	1.97%
51	***California***	12	11,600	399,400	2.90%
53	***California***	13	11,400	340,200	3.35%
19	***California***	14	15,400	364,000	4.23%
6	***California***	15	27,600	336,400	8.20%
434	***California***	16	2,100	244,900	0.86%
1	***California***	17	60,900	346,100	17.60%
2	***California***	18	49,500	344,500	14.37%
3	***California***	19	39,400	324,000	12.16%
221	***California***	20	6,800	302,500	2.25%
436	***California***	21	600	243,800	0.25%
423	***California***	22	2,900	289,600	1.00%
431	***California***	23	2,400	274,100	0.88%
366	***California***	24	4,400	323,500	1.36%
179	***California***	25	7,700	302,700	2.54%
169	***California***	26	7,800	325,900	2.39%
113	***California***	27	9,000	332,200	2.71%
154	***California***	28	8,200	359,900	2.28%
165	***California***	29	8,000	303,700	2.63%
78	***California***	30	10,000	358,200	2.79%
260	***California***	31	6,300	292,200	2.16%
115	***California***	32	8,900	293,800	3.03%
110	***California***	33	9,100	364,200	2.50%
13	***California***	34	16,700	309,400	5.40%
49	***California***	35	11,800	284,800	4.14%
426	***California***	36	2,700	251,900	1.07%
75	***California***	37	10,100	335,600	3.01%
79	***California***	38	10,000	313,300	3.19%
41	***California***	39	12,400	332,000	3.73%
16	***California***	40	16,300	280,500	5.81%
288	***California***	41	5,900	271,900	2.17%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
136	***California***	42	8,500	307,000	2.77%
146	***California***	43	8,300	302,800	2.74%
96	***California***	44	9,400	270,600	3.47%
15	***California***	45	16,400	354,400	4.63%
43	***California***	46	12,200	314,400	3.88%
161	***California***	47	8,100	327,600	2.47%
23	***California***	48	14,500	352,600	4.11%
39	***California***	49	12,500	299,700	4.17%
170	***California***	50	7,800	296,200	2.63%
352	***California***	51	4,700	258,600	1.82%
9	***California***	52	17,600	350,100	5.03%
162	***California***	53	8,100	342,700	2.36%
171	***Colorado***	1	7,800	384,400	2.03%
27	***Colorado***	2	14,000	384,600	3.64%
367	***Colorado***	3	4,400	331,400	1.33%
40	***Colorado***	4	12,500	344,100	3.63%
183	***Colorado***	5	7,600	315,900	2.41%
137	***Colorado***	6	8,500	369,600	2.30%
195	***Colorado***	7	7,400	362,500	2.04%
226	***Connecticut***	1	6,700	349,800	1.92%
234	***Connecticut***	2	6,600	348,600	1.89%
147	***Connecticut***	3	8,300	352,700	2.35%
148	***Connecticut***	4	8,300	343,000	2.42%
138	***Connecticut***	5	8,500	348,300	2.44%
417	***DC***	Statewide	3,100	310,600	1.00%
273	***Delaware***	Statewide	6,100	420,400	1.45%
418	***Florida***	1	3,100	303,900	1.02%
394	***Florida***	2	3,800	301,500	1.26%
424	***Florida***	3	2,900	277,000	1.05%
353	***Florida***	4	4,700	329,900	1.42%
376	***Florida***	5	4,200	284,000	1.48%
377	***Florida***	6	4,200	283,200	1.48%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
301	***Florida***	7	5,700	322,500	1.77%
155	***Florida***	8	8,200	283,400	2.89%
406	***Florida***	9	3,500	317,200	1.10%
368	***Florida***	10	4,400	331,500	1.33%
419	***Florida***	11	3,100	217,400	1.43%
261	***Florida***	12	6,300	283,200	2.22%
203	***Florida***	13	7,200	309,200	2.33%
326	***Florida***	14	5,100	320,700	1.59%
359	***Florida***	15	4,500	304,200	1.48%
357	***Florida***	16	4,600	276,100	1.67%
435	***Florida***	17	1,800	248,700	0.72%
381	***Florida***	18	4,100	284,000	1.44%
420	***Florida***	19	3,000	265,200	1.13%
345	***Florida***	20	4,800	302,100	1.59%
354	***Florida***	21	4,700	316,800	1.48%
204	***Florida***	22	7,200	332,000	2.17%
188	***Florida***	23	7,500	339,900	2.21%
372	***Florida***	24	4,300	293,400	1.47%
302	***Florida***	25	5,700	326,000	1.75%
373	***Florida***	26	4,300	335,600	1.28%
321	***Florida***	27	5,200	313,600	1.66%
409	***Georgia***	1	3,400	286,100	1.19%
346	***Georgia***	2	4,800	251,200	1.91%
139	***Georgia***	3	8,500	285,800	2.97%
274	***Georgia***	4	6,100	311,700	1.96%
275	***Georgia***	5	6,100	318,100	1.92%
85	***Georgia***	6	9,800	361,200	2.71%
64	***Georgia***	7	10,600	312,500	3.39%
378	***Georgia***	8	4,200	272,700	1.54%
140	***Georgia***	9	8,500	284,600	2.99%
289	***Georgia***	10	5,900	287,400	2.05%
166	***Georgia***	11	8,000	340,900	2.35%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
308	***Georgia***	12	5,500	278,200	1.98%
309	***Georgia***	13	5,500	312,800	1.76%
10	***Georgia***	14	17,400	290,700	5.99%
374	***Hawaii***	1	4,300	330,100	1.30%
429	***Hawaii***	2	2,500	299,400	0.84%
76	***Idaho***	1	10,100	329,900	3.06%
149	***Idaho***	2	8,300	355,000	2.34%
339	***Illinois***	1	4,900	290,200	1.69%
306	***Illinois***	2	5,600	278,200	2.01%
241	***Illinois***	3	6,500	319,500	2.03%
106	***Illinois***	4	9,200	326,600	2.82%
92	***Illinois***	5	9,600	397,600	2.41%
11	***Illinois***	6	17,200	355,600	4.84%
327	***Illinois***	7	5,100	298,500	1.71%
37	***Illinois***	8	12,900	366,300	3.52%
86	***Illinois***	9	9,800	347,200	2.82%
61	***Illinois***	10	10,900	324,800	3.36%
58	***Illinois***	11	11,100	347,300	3.20%
347	***Illinois***	12	4,800	301,000	1.59%
369	***Illinois***	13	4,400	326,600	1.35%
62	***Illinois***	14	10,900	351,000	3.11%
290	***Illinois***	15	5,900	316,500	1.86%
214	***Illinois***	16	7,000	330,800	2.12%
199	***Illinois***	17	7,300	311,700	2.34%
262	***Illinois***	18	6,300	337,500	1.87%
222	***Indiana***	1	6,800	310,600	2.19%
70	***Indiana***	2	10,300	317,800	3.24%
45	***Indiana***	3	12,000	327,000	3.67%
180	***Indiana***	4	7,700	328,500	2.34%
196	***Indiana***	5	7,400	357,700	2.07%
121	***Indiana***	6	8,800	311,900	2.82%
200	***Indiana***	7	7,300	312,200	2.34%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
67	***Indiana***	8	10,500	329,300	3.19%
172	***Indiana***	9	7,800	339,400	2.30%
87	***Iowa***	1	9,800	392,300	2.50%
141	***Iowa***	2	8,500	373,400	2.28%
282	***Iowa***	3	6,000	390,800	1.54%
310	***Iowa***	4	5,500	382,300	1.44%
382	***Kansas***	1	4,100	345,900	1.19%
303	***Kansas***	2	5,700	339,900	1.68%
127	***Kansas***	3	8,700	370,300	2.35%
395	***Kansas***	4	3,800	332,900	1.14%
215	***Kentucky***	1	7,000	284,800	2.46%
134	***Kentucky***	2	8,600	317,100	2.71%
128	***Kentucky***	3	8,700	333,300	2.61%
227	***Kentucky***	4	6,700	333,500	2.01%
405	***Kentucky***	5	3,600	234,300	1.54%
54	***Kentucky***	6	11,400	335,400	3.40%
396	***Louisiana***	1	3,800	354,000	1.07%
415	***Louisiana***	2	3,200	329,000	0.97%
400	***Louisiana***	3	3,700	328,100	1.13%
390	***Louisiana***	4	4,000	311,100	1.29%
425	***Louisiana***	5	2,900	283,900	1.02%
383	***Louisiana***	6	4,100	367,800	1.11%
251	***Maine***	1	6,400	340,400	1.88%
252	***Maine***	2	6,400	302,700	2.11%
314	***Maryland***	1	5,400	342,300	1.58%
340	***Maryland***	2	4,900	351,700	1.39%
319	***Maryland***	3	5,300	369,500	1.43%
276	***Maryland***	4	6,100	384,100	1.59%
333	***Maryland***	5	5,000	368,200	1.36%
209	***Maryland***	6	7,100	363,200	1.95%
355	***Maryland***	7	4,700	315,700	1.49%
189	***Maryland***	8	7,500	400,100	1.87%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
283	***Massachusetts***	1	6,000	341,000	1.76%
22	***Massachusetts***	2	14,800	356,500	4.15%
8	***Massachusetts***	3	20,600	355,400	5.80%
24	***Massachusetts***	4	14,200	374,800	3.79%
31	***Massachusetts***	5	13,500	387,400	3.48%
80	***Massachusetts***	6	10,000	372,000	2.69%
263	***Massachusetts***	7	6,300	369,800	1.70%
150	***Massachusetts***	8	8,300	375,600	2.21%
163	***Massachusetts***	9	8,100	352,300	2.30%
341	***Michigan***	1	4,900	290,200	1.69%
99	***Michigan***	2	9,300	315,900	2.94%
164	***Michigan***	3	8,100	315,300	2.57%
253	***Michigan***	4	6,400	286,300	2.24%
342	***Michigan***	5	4,900	264,800	1.85%
190	***Michigan***	6	7,500	310,400	2.42%
277	***Michigan***	7	6,100	299,100	2.04%
191	***Michigan***	8	7,500	330,800	2.27%
201	***Michigan***	9	7,300	326,100	2.24%
156	***Michigan***	10	8,200	308,700	2.66%
129	***Michigan***	11	8,700	342,100	2.54%
322	***Michigan***	12	5,200	313,800	1.66%
360	***Michigan***	13	4,500	230,700	1.95%
334	***Michigan***	14	5,000	257,700	1.94%
14	***Minnesota***	1	16,600	348,200	4.77%
18	***Minnesota***	2	15,500	358,300	4.33%
20	***Minnesota***	3	14,900	353,800	4.21%
157	***Minnesota***	4	8,200	336,000	2.44%
100	***Minnesota***	5	9,300	352,000	2.64%
59	***Minnesota***	6	11,000	348,700	3.15%
205	***Minnesota***	7	7,200	328,700	2.19%
269	***Minnesota***	8	6,200	303,400	2.04%
77	***Mississippi***	1	10,100	305,600	3.30%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
384	***Mississippi***	2	4,100	266,900	1.54%
323	***Mississippi***	3	5,200	303,900	1.71%
348	***Mississippi***	4	4,800	304,900	1.57%
320	***Missouri***	1	5,300	331,500	1.60%
158	***Missouri***	2	8,200	378,600	2.17%
254	***Missouri***	3	6,400	370,000	1.73%
343	***Missouri***	4	4,900	324,900	1.51%
278	***Missouri***	5	6,100	345,300	1.77%
291	***Missouri***	6	5,900	355,900	1.66%
206	***Missouri***	7	7,200	337,400	2.13%
242	***Missouri***	8	6,500	298,500	2.18%
349	***Montana***	Statewide	4,800	480,000	1.00%
304	***Nebraska***	1	5,700	321,700	1.77%
305	***Nebraska***	2	5,700	316,300	1.80%
410	***Nebraska***	3	3,400	305,600	1.11%
411	***Nevada***	1	3,400	284,700	1.19%
297	***Nevada***	2	5,800	309,400	1.87%
385	***Nevada***	3	4,100	336,500	1.22%
412	***Nevada***	4	3,400	274,300	1.24%
56	***New Hampshire***	1	11,200	352,600	3.18%
38	***New Hampshire***	2	12,800	332,200	3.85%
235	***New Jersey***	1	6,600	339,200	1.95%
361	***New Jersey***	2	4,500	324,400	1.39%
279	***New Jersey***	3	6,100	344,200	1.77%
228	***New Jersey***	4	6,700	326,400	2.05%
65	***New Jersey***	5	10,600	356,100	2.98%
116	***New Jersey***	6	8,900	353,600	2.52%
32	***New Jersey***	7	13,300	377,100	3.53%
81	***New Jersey***	8	10,000	371,000	2.70%
122	***New Jersey***	9	8,800	338,500	2.60%
270	***New Jersey***	10	6,200	310,700	2.00%
72	***New Jersey***	11	10,200	358,800	2.84%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
210	***New Jersey***	12	7,100	352,400	2.01%
229	***New Mexico***	1	6,700	311,900	2.15%
432	***New Mexico***	2	2,400	273,100	0.88%
358	***New Mexico***	3	4,600	284,800	1.62%
123	***New York***	1	8,800	343,300	2.56%
111	***New York***	2	9,100	357,800	2.54%
264	***New York***	3	6,300	336,700	1.87%
350	***New York***	4	4,800	342,500	1.40%
292	***New York***	5	5,900	336,200	1.75%
293	***New York***	6	5,900	327,000	1.80%
124	***New York***	7	8,800	322,200	2.73%
344	***New York***	8	4,900	292,700	1.67%
328	***New York***	9	5,100	324,900	1.57%
284	***New York***	10	6,000	360,300	1.67%
324	***New York***	11	5,200	317,500	1.64%
130	***New York***	12	8,700	418,800	2.08%
325	***New York***	13	5,200	317,200	1.64%
307	***New York***	14	5,600	341,800	1.64%
397	***New York***	15	3,800	255,900	1.48%
311	***New York***	16	5,500	323,600	1.70%
216	***New York***	17	7,000	341,400	2.05%
21	***New York***	18	14,900	332,100	4.49%
83	***New York***	19	9,900	327,300	3.02%
271	***New York***	20	6,200	357,600	1.73%
265	***New York***	21	6,300	309,200	2.04%
151	***New York***	22	8,300	320,200	2.59%
184	***New York***	23	7,600	324,600	2.34%
181	***New York***	24	7,700	327,300	2.35%
66	***New York***	25	10,600	335,400	3.16%
294	***New York***	26	5,900	327,700	1.80%
192	***New York***	27	7,500	337,800	2.22%
243	***North Carolina***	1	6,500	291,800	2.23%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
36	***North Carolina***	2	13,200	303,800	4.34%
401	***North Carolina***	3	3,700	305,600	1.21%
73	***North Carolina***	4	10,200	350,900	2.91%
52	***North Carolina***	5	11,500	324,500	3.54%
33	***North Carolina***	6	13,300	341,800	3.89%
335	***North Carolina***	7	5,000	315,400	1.59%
42	***North Carolina***	8	12,400	301,700	4.11%
88	***North Carolina***	9	9,800	371,400	2.64%
34	***North Carolina***	10	13,300	324,000	4.10%
144	***North Carolina***	11	8,400	295,400	2.84%
84	***North Carolina***	12	9,900	319,800	3.10%
28	***North Carolina***	13	13,900	349,900	3.97%
407	***North Dakota***	Statewide	3,500	370,800	0.94%
244	***Ohio***	1	6,500	332,300	1.96%
285	***Ohio***	2	6,000	323,600	1.85%
266	***Ohio***	3	6,300	333,000	1.89%
107	***Ohio***	4	9,200	317,900	2.89%
117	***Ohio***	5	8,900	334,200	2.66%
236	***Ohio***	6	6,600	292,300	2.26%
89	***Ohio***	7	9,800	326,800	3.00%
142	***Ohio***	8	8,500	328,800	2.59%
237	***Ohio***	9	6,600	315,000	2.10%
217	***Ohio***	10	7,000	312,800	2.24%
329	***Ohio***	11	5,100	275,200	1.85%
230	***Ohio***	12	6,700	359,500	1.86%
125	***Ohio***	13	8,800	320,400	2.75%
74	***Ohio***	14	10,200	349,700	2.92%
245	***Ohio***	15	6,500	336,400	1.93%
118	***Ohio***	16	8,900	355,600	2.50%
97	***Oklahoma***	1	9,400	361,900	2.60%
330	***Oklahoma***	2	5,100	290,300	1.76%
362	***Oklahoma***	3	4,500	329,900	1.36%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
182	***Oklahoma***	4	7,700	350,900	2.19%
295	***Oklahoma***	5	5,900	348,800	1.69%
5	***Oregon***	1	32,500	377,200	8.62%
298	***Oregon***	2	5,800	314,200	1.85%
46	***Oregon***	3	11,900	383,300	3.10%
193	***Oregon***	4	7,500	309,000	2.43%
173	***Oregon***	5	7,800	326,700	2.39%
331	***Pennsylvania***	1	5,100	273,300	1.87%
391	***Pennsylvania***	2	3,900	273,100	1.43%
114	***Pennsylvania***	3	9,000	317,700	2.83%
159	***Pennsylvania***	4	8,200	342,900	2.39%
185	***Pennsylvania***	5	7,600	316,800	2.40%
101	***Pennsylvania***	6	9,300	362,300	2.57%
186	***Pennsylvania***	7	7,600	339,700	2.24%
102	***Pennsylvania***	8	9,300	357,800	2.60%
238	***Pennsylvania***	9	6,600	304,800	2.17%
174	***Pennsylvania***	10	7,800	312,500	2.50%
218	***Pennsylvania***	11	6,900	329,300	2.10%
145	***Pennsylvania***	12	8,400	331,900	2.53%
211	***Pennsylvania***	13	7,100	339,000	2.09%
255	***Pennsylvania***	14	6,400	323,200	1.98%
98	***Pennsylvania***	15	9,400	343,800	2.73%
175	***Pennsylvania***	16	7,800	327,700	2.38%
176	***Pennsylvania***	17	7,800	312,600	2.50%
135	***Pennsylvania***	18	8,600	345,000	2.49%
223	***Rhode Island***	1	6,800	250,900	2.71%
207	***Rhode Island***	2	7,200	260,300	2.77%
363	***South Carolina***	1	4,500	299,800	1.50%
267	***South Carolina***	2	6,300	305,600	2.06%
90	***South Carolina***	3	9,700	264,500	3.67%
93	***South Carolina***	4	9,600	301,000	3.19%
112	***South Carolina***	5	9,100	275,200	3.31%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
336	***South Carolina***	6	5,000	253,500	1.97%
246	***South Carolina***	7	6,500	269,400	2.41%
247	***South Dakota***	1	6,500	415,600	1.56%
187	***Tennessee***	1	7,600	297,600	2.55%
280	***Tennessee***	2	6,100	327,200	1.86%
168	***Tennessee***	3	7,900	297,000	2.66%
103	***Tennessee***	4	9,300	314,500	2.96%
94	***Tennessee***	5	9,600	353,400	2.72%
202	***Tennessee***	6	7,300	304,500	2.40%
131	***Tennessee***	7	8,700	285,800	3.04%
231	***Tennessee***	8	6,700	299,200	2.24%
268	***Tennessee***	9	6,300	305,300	2.06%
337	***Texas***	1	5,000	297,700	1.68%
17	***Texas***	2	15,600	364,600	4.28%
7	***Texas***	3	21,900	371,200	5.90%
256	***Texas***	4	6,400	299,300	2.14%
257	***Texas***	5	6,400	300,800	2.13%
132	***Texas***	6	8,700	348,800	2.49%
50	***Texas***	7	11,700	376,300	3.11%
281	***Texas***	8	6,100	309,200	1.97%
197	***Texas***	9	7,400	326,400	2.27%
12	***Texas***	10	17,100	342,600	4.99%
402	***Texas***	11	3,700	308,800	1.20%
68	***Texas***	12	10,400	337,500	3.08%
386	***Texas***	13	4,100	309,000	1.33%
392	***Texas***	14	3,900	303,300	1.29%
414	***Texas***	15	3,300	280,900	1.17%
286	***Texas***	16	6,000	281,300	2.13%
25	***Texas***	17	14,200	329,300	4.31%
30	***Texas***	18	13,800	306,400	4.50%
403	***Texas***	19	3,700	310,700	1.19%
387	***Texas***	20	4,100	311,400	1.32%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
160	***Texas***	21	8,200	361,200	2.27%
224	***Texas***	22	6,800	352,500	1.93%
388	***Texas***	23	4,100	289,700	1.42%
35	***Texas***	24	13,300	388,600	3.42%
47	***Texas***	25	11,900	302,200	3.94%
95	***Texas***	26	9,500	368,300	2.58%
338	***Texas***	27	5,000	305,600	1.64%
421	***Texas***	28	3,000	266,300	1.13%
272	***Texas***	29	6,200	292,900	2.12%
239	***Texas***	30	6,600	292,300	2.26%
4	***Texas***	31	34,700	323,000	10.74%
26	***Texas***	32	14,100	360,900	3.91%
69	***Texas***	33	10,400	283,900	3.66%
427	***Texas***	34	2,700	242,200	1.11%
219	***Texas***	35	6,900	318,200	2.17%
370	***Texas***	36	4,400	291,900	1.51%
225	***Utah***	1	6,800	312,400	2.18%
212	***Utah***	2	7,100	305,700	2.32%
167	***Utah***	3	8,000	311,200	2.57%
177	***Utah***	4	7,800	331,500	2.35%
126	***Vermont***	Statewide	8,800	327,300	2.69%
312	***Virginia***	1	5,500	352,400	1.56%
351	***Virginia***	2	4,800	339,800	1.41%
375	***Virginia***	3	4,300	320,100	1.34%
299	***Virginia***	4	5,800	327,900	1.77%
220	***Virginia***	5	6,900	316,100	2.18%
258	***Virginia***	6	6,400	339,900	1.88%
232	***Virginia***	7	6,700	364,600	1.84%
332	***Virginia***	8	5,100	423,700	1.20%
152	***Virginia***	9	8,300	298,400	2.78%
108	***Virginia***	10	9,200	376,400	2.44%
240	***Virginia***	11	6,600	400,900	1.65%

Supplemental Table 4 (cont.)

Rank (by jobs displaced as a share of total)	State	District	Net jobs displaced	District employment (in 2011)	Jobs displaced as a share of employment
71	***Washington***	1	10,300	332,300	3.10%
389	***Washington***	2	4,100	318,900	1.29%
104	***Washington***	3	9,300	284,500	3.27%
428	***Washington***	4	2,600	284,500	0.91%
356	***Washington***	5	4,700	291,500	1.61%
408	***Washington***	6	3,500	275,500	1.27%
153	***Washington***	7	8,300	380,000	2.18%
371	***Washington***	8	4,400	318,000	1.38%
233	***Washington***	9	6,700	341,400	1.96%
287	***Washington***	10	6,000	291,300	2.06%
364	***West Virginia***	1	4,500	258,700	1.74%
398	***West Virginia***	2	3,800	266,900	1.42%
430	***West Virginia***	3	2,500	223,000	1.12%
82	***Wisconsin***	1	10,000	342,500	2.92%
143	***Wisconsin***	2	8,500	390,000	2.18%
60	***Wisconsin***	3	11,000	353,500	3.11%
178	***Wisconsin***	4	7,800	308,000	2.53%
48	***Wisconsin***	5	11,900	370,600	3.21%
55	***Wisconsin***	6	11,300	353,600	3.20%
119	***Wisconsin***	7	8,900	338,400	2.63%
91	***Wisconsin***	8	9,700	362,800	2.67%
433	***Wyoming***	Statewide	2,300	290,000	0.79%
Total*			3,443,400	140,399,600	2.45%

Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau (2013), U.S. International Trade Commission (USITC 2016a), Bureau of Labor Statistics (BLS 2016e), and BLS Employment Projections program (BLS-EP 2014a and 2014b). For a more detailed explanation of data sources and computations, see the appendix.

Economic Policy Institute

Supplemental Table 5

U.S. goods trade with China, by industry, 2001–2015 (in billions of nominal dollars)

	2001			2015			Change 2001–2015			Percent change 2001–2015		
Industry*	Imports	Exports	Trade balance	Imports	Exports	Trade balance	Change in imports	Change in exports	Change in trade balance	Change in imports	Change in exports	Change in trade balance
Agriculture, forestry, fishing, and hunting	$0.8	$1.4	$0.6	$3.0	$17.1	$14.1	$2.2	$15.8	$13.5	299%	N/A*	N/A*
Mining	$0.3	$0.1	-$0.2	$0.3	$2.2	$1.9	$0.0	$2.1	$2.1	-11%	N/A*	N/A*
Oil and gas	$0.1	$0.0	-$0.1	$0.0	$1.0	$1.0	-$0.1	$1.0	$1.1	-99%	N/A*	-965%
Minerals and ores	$0.2	$0.1	-$0.1	$0.2	$1.2	$0.9	$0.1	$1.1	$1.0	56%	N/A*	N/A*
Manufacturing	$101.0	$16.7	-$84.4	$479.5	$90.7	-$388.8	$378.4	$74.0	-$304.4	375%	444%	361%
Nondurable goods	$23.4	$1.0	-$22.4	$75.2	$6.0	-$69.2	$51.8	$5.0	-$46.8	221%	499%	209%
Food	$0.6	$0.8	$0.2	$3.5	$3.3	-$0.3	$3.0	$2.5	-$0.4	499%	324%	-246%
Beverage and tobacco products	$0.0	$0.0	$0.0	$0.1	$1.7	$1.7	$0.0	$1.7	$1.7	106%	N/A*	N/A*
Textile mills and textile product mills	$2.2	$0.1	-$2.1	$12.9	$0.5	-$12.5	$10.8	$0.4	-$10.4	492%	401%	496%
Apparel	$8.6	$0.0	-$8.6	$33.6	$0.1	-$33.5	$25.0	$0.0	-$25.0	291%	142%	291%
Leather and allied products	$12.0	$0.1	-$11.9	$25.0	$0.4	-$24.5	$13.0	$0.3	-$12.7	109%	363%	107%
Industrial supplies	$9.6	$3.4	-$6.1	$47.5	$20.4	-$27.1	$37.9	$17.0	-$21.0	397%	498%	341%
Wood products	$0.9	$0.1	-$0.8	$4.0	$1.2	-$2.8	$3.1	$1.1	-$2.0	351%	N/A*	255%
Paper	$0.7	$0.5	-$0.2	$3.9	$2.5	-$1.4	$3.2	$1.9	-$1.2	447%	375%	644%
Printed matter and related products	$0.7	$0.1	-$0.7	$2.6	$0.2	-$2.3	$1.8	$0.1	-$1.7	251%	187%	259%
Petroleum and coal products	$0.2	$0.1	-$0.1	$0.5	$1.0	$0.5	$0.3	$0.9	$0.6	145%	N/A*	-585%
Chemicals	$1.8	$2.2	$0.4	$14.0	$13.4	-$0.6	$12.2	$11.2	-$0.9	668%	508%	-245%
Plastics and rubber products	$2.7	$0.2	-$2.5	$15.2	$1.3	-$13.9	$12.5	$1.1	-$11.4	461%	542%	454%
Nonmetallic mineral products	$2.5	$0.2	-$2.3	$7.4	$0.7	-$6.7	$4.9	$0.5	-$4.4	195%	232%	191%
Durable goods	$68.1	$12.3	-$55.9	$356.9	$64.3	-$292.6	$288.7	$52.0	-$236.7	424%	424%	424%
Primary metal	$0.9	$0.2	-$0.6	$5.3	$1.8	-$3.5	$4.5	$1.6	-$2.9	524%	658%	472%
Fabricated metal products	$3.9	$0.3	-$3.6	$21.3	$2.2	-$19.0	$17.4	$1.9	-$15.5	448%	648%	432%
Machinery	$4.5	$2.5	-$2.0	$30.0	$9.5	-$20.5	$25.5	$7.0	-$18.5	561%	276%	916%
Computer and electronic parts	$24.4	$5.3	-$19.1	$176.6	$17.4	-$159.3	$152.3	$12.1	-$140.2	625%	227%	736%
Computer and peripheral equipment	$8.2	$1.6	-$6.6	$63.4	$2.2	-$61.2	$55.3	$0.6	-$54.6	676%	40%	828%
Communications, audio and video equipment	$9.4	$0.9	-$8.5	$82.2	$2.8	-$79.5	$72.8	$1.8	-$71.0	772%	199%	834%
Navigational, measuring, electromedical, and control instruments	$1.2	$1.0	-$0.3	$7.6	$5.5	-$2.1	$6.3	$4.5	-$1.8	507%	448%	739%
Semiconductor and other electronic components, and reproducing magnetic and optical media	$5.5	$1.8	-$3.7	$23.4	$6.9	-$16.5	$17.9	$5.1	-$12.8	325%	283%	346%
Electrical equipment,	$9.1	$0.5	-$8.6	$37.0	$2.7	-$34.3	$27.9	$2.2	-$25.7	308%	452%	299%

Supplemental Table 5 (cont.)

Industry*	2001 Imports	2001 Exports	2001 Trade balance	2015 Imports	2015 Exports	2015 Trade balance	Change 2001–2015 Change in imports	Change 2001–2015 Change in exports	Change 2001–2015 Change in trade balance	Percent change 2001–2015 Change in imports	Percent change 2001–2015 Change in exports	Percent change 2001–2015 Change in trade balance
appliances, and components												
Transportation equipment	$1.8	$2.9	$1.1	$17.5	$26.8	$9.4	$15.7	$23.9	$8.3	863%	824%	758%
Motor vehicles and motor vehicle parts	$1.0	$0.3	-$0.8	$14.5	$11.3	-$3.3	$13.5	$11.0	-$2.5	N/A*	N/A*	324%
Aerospace products and parts	$0.1	$2.6	$2.5	$0.9	$15.4	$14.6	$0.8	$12.8	$12.1	868%	492%	479%
Railroad, ship, and other transportation equipment	$0.7	$0.0	-$0.7	$2.1	$0.1	-$2.0	$1.4	$0.1	-$1.3	205%	374%	200%
Furniture and related products	$4.9	$0.0	-$4.9	$20.2	$0.2	-$20.0	$15.2	$0.1	-$15.1	308%	648%	306%
Miscellaneous manufactured commodities	$18.7	$0.5	-$18.2	$49.0	$3.7	-$45.3	$30.4	$3.3	-$27.1	163%	667%	149%
Information	$0.0	$0.0	$0.0	$0.0	$0.1	$0.1	$0.0	$0.1	$0.1	-33%	N/A*	N/A*
Scrap and second-hand goods	$0.2	$1.1	$0.9	$0.5	$6.0	$5.5	$0.3	$4.9	$4.6	165%	439%	497%
Total	$102.28	$19.23	-$83.0	$483.2	$116.1	-$367.2	$381.0	$96.8	-$284.1	372%	504%	342%

* Excludes utilities, construction, and service sectors, which reported no goods trade in this period.

** Includes publishing industries (excluding Internet); goods trade in this sector is concentrated in NAICS 5111, newspaper, periodical, book, and directory publishers.

N/A* Growth rates in excess of 1,000% are generally due to small trade flows in base year.

Source: Author's analysis of U.S. International Trade Commission (USITC 2016a). For a more detailed explanation of the data sources and computations, see the appendix.

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