WORKING PAPER

U.S.-China Trade, 1989-2003

Impact on jobs and industries, nationally and state-by-state

A Research Report Prepared for the
U.S.-China Economic and Security Review Commission

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U.S.-CHINA TRADE, 1989-2003

The rise in the United States' trade deficit with China between 1989 and 2003 caused the displacement of production that supported 1.5 million U.S. jobs. Some of those jobs were related to production or services that ceased or moved elsewhere; others are jobs in supplying industries. These jobs reflect the effect on labor demand – in lost job opportunities – in an economy with a worsening balance between exports and imports. Most of those lost opportunities[1] were in the high-wage and job-hemorrhaging manufacturing sector. The number of job opportunities lost each year grew rapidly during the 1990s, and accelerated after China entered the World Trade Organization (WTO) in 2001. The loss of these potential jobs is just the most visible tip of China's impact on the U.S. economy.

During the 14-year period covered by this study, there has been a significant shift in the kinds of industries suffering job displacement, a shift that runs counter to initial expectations. Where the largest impact was once felt in labor-intensive, lower-tech manufacturing industries such as apparel and shoes, the fastest growth in job displacement is now occurring in highly skilled and advanced technology areas once considered relatively immune, such as electronics, computers, and communications equipment.

Major findings of this study include:

- The loss of job-supporting production due to growing trade deficits with China has more than doubled since it entered the WTO in 2001. The 1.5 million job opportunities lost nationwide are distributed among all 50 states and the District of Columbia, with the biggest losers, in numeric terms: California (-199,922), Texas (-99,420), New York (-81,721), Pennsylvania (-69,822), Illinois (-69,668), North Carolina (-62,698), Florida (-60,026), Ohio (-58,094), Michigan (-50,991), and Georgia (-46,848).
- The 10 hardest-hit states, as a share of total state employment, are: Maine (-14,951, or -2.47%), Arkansas (-19,123, -1.67%), North Carolina (-62,698, -1.65%), Rhode Island (-7,548, -1.56%), New Hampshire (-9,443, -1.53%), Indiana (-43,533, -1.50%), Massachusetts (-46,463, -1.46%), Wisconsin (-39,668, -1.43%), Vermont (-4,211, -1.41%), and California (-199,922, -1.39%).

- China's exports to the United States of electronics, computers, and communications equipment, along with other products that use more highly skilled labor and advanced technologies, are growing much faster than its exports of low-value, labor-intensive items such as apparel, shoes, and plastic products.
- Consequently, China now accounts for the entire $32 billion U.S. trade deficit in Advanced Technology Products (ATP).
- China is also rapidly gaining advantage in more advanced industries such as autos and aerospace products.

China's entry into the WTO was supposed to provide openings for sufficiently rapid growth in U.S. exports to reduce the trade deficit with China. While the export growth rate has increased since 2001 (from a very small base), the value of those exports has been swamped by a rapidly rising tide of imports. The WTO is a free trade and investment agreement that has provided investors with a unique set of guarantees designed to stimulate foreign direct investment and the movement of factories around the world, especially from the United States to low-wage locations such as China and Mexico (Scott 2003). Furthermore, no protections were contained in the core of the agreement to maintain labor or environmental standards. China's refusal to revalue its exchange rate, despite enormous demand for its currency, is also a major contributor to the growth of the U.S. trade deficit. Thus, the WTO and the broader process of globalization have tilted the economic playing field in favor of investors, and against workers and the environment, resulting in a race to the bottom in wages and environmental quality.

Dissecting trade and employment flows

An analysis of the effect of trade on the domestic economy begins by considering the impact of both imports and exports. If the United States exports 1,000 computers to China, many American workers are employed in their production. If, however, the United States imports 1,000 computers from China rather than building them domestically, then a similar number of Americans who otherwise could have been employed by the office machine industry and its suppliers will have to find other work. Hence, increases in exports support domestic employment, while increases in imports displace domestic production that could have supported more jobs in any given sector. Some analysts examine only the benefits of growing exports to the economy, while ignoring the role of imports. This is especially true at the state and metropolitan level, because the U.S. Census Bureau generates a series of reports on exports from these regions. No comparable statistics on domestic production displaced by imports are available from the U.S. government. This report is designed in part to begin filling that gap with estimates of the employment effects of imports and exports from China at the state level.

The study begins with an overview of trends in U.S.-China trade and employment-supporting production flows, with an emphasis on developments since China's 2001 entry into the WTO. The next section examines trends in trade flows and employment opportunities in major industries, followed by a brief examination of results for a full set of about 190 industries. Next follows an analysis of the effects of changes in trade flows at the state level. The paper concludes with a discussion of the methodology used, a review of employment multiplier concepts and results, and a discussion of topics for future research.

Overview

Total trade flows between the United States and China are shown in the top half of **Table 1**. U.S. exports increased from $5.8 billion in 1989 to $26.1 billion in 2003, a fourfold increase. Imports rose from $11.9 billion to $151.7 billion in the same period, a twelvefold increase on top of a base that was already twice as large as exports. As a result, the U.S.-China trade deficit increased $119.5 billion, a twentyfold increase.

Table 1:
U.S. trade with China and trade-related job creation and displacement, 1989-2003

U.S. trade with China (billions of constant 1996 dollars)

						Changes in:				
						Dollars				percent
	1989	1997†	1997*	2001	2003	1989-97†	1997-2001*	2001-2003	1989-2003	1989-2003
U.S. exports	$5.8	$13.1	$12.5	$18.1	$26.1	$7.3	$5.6	$8.0	$20.3	347.75%
U.S. imports	-$11.9	-$63.4	-$61.8	-$101.7	-$151.7	-$51.5	-$39.9	-$50.0	-$139.8	1,171.71%
U.S. trade balance	-$6.1	-$50.3	-$49.3	-$83.6	-$125.6	-$44.2	-$34.3	-$42.0	-$119.5	1,960.19%

U.S. trade-related job creation and displacement (thousands of jobs)

						Changes in:				
						Jobs				percent
	1989	1997†	1997*	2001	2003	1989-97†	1997-2001*	2001-2003	1989-2003	1989-2003
U.S. exports	66	131	131	177	264	65	46	87	199	302%
U.S. imports	-161	-790	-798	-1264	-1820	-629	-466	-556	-1,659	1,029%
U.S. trade balance	-95	-659	-667	-1086	-1555	-564	-420	-469	-1,460	1,531%

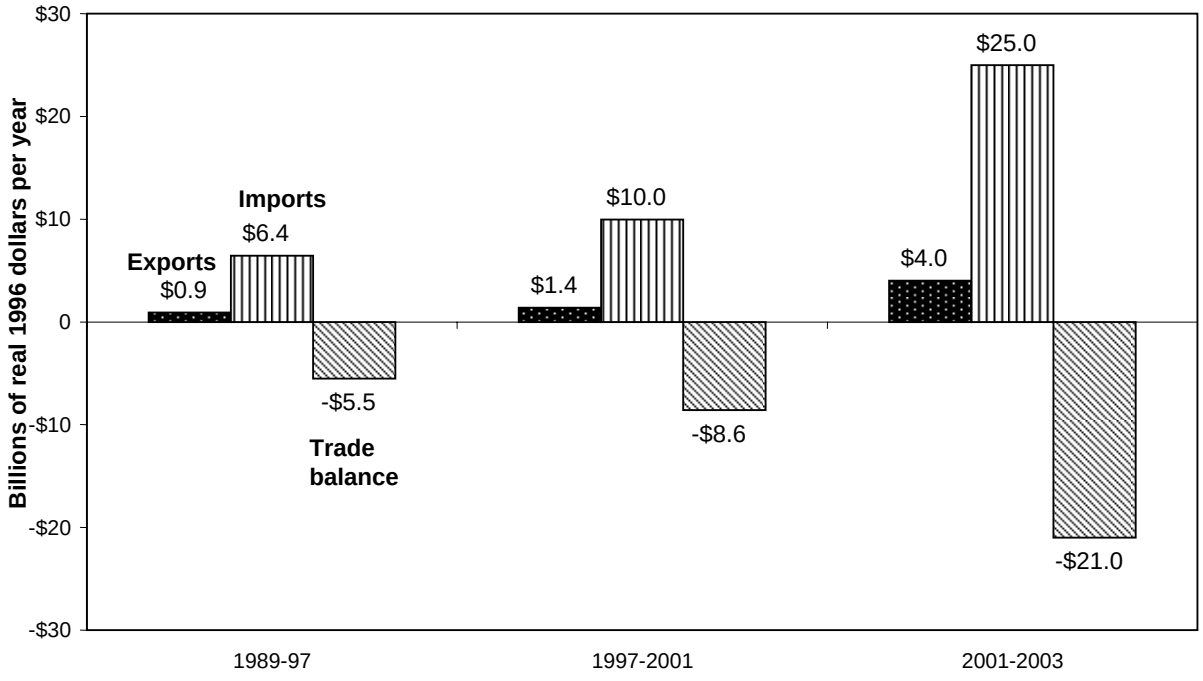
†1997 results for SIC based analysis (see also Note 5).

*1997 results for NAICS based analysis (see also Note 6).

Source: EPI analysis of Bureau of Labor Statistics, Bureau of Economic Analysis, U.S. Census Bureau.

The rate of growth of U.S. trade with China has accelerated since 1989, as shown in **Figure 1**. Between 1989 and 1997, U.S. imports from China grew an average of $6.4 billion per year; while exports increased about $1 billion per year. Thus the trade deficit widened $5.5 billion per year, on average, in this period.

Figure 1:
Growth in U.S. trade with China 1989-2003



Source: USITC (2004).

Between 1997 and 2001, import growth increased more than 50% (to $10 billion per year) export growth picked up slightly (to $1.4 billion), and the trade gap expanded by $8.6 billion per year. Between 2001 and 2003, import growth jumped to $25 billion per year, a 150% rise in only four years. Exports grew rapidly, but not enough to offset the explosion in imports, so deficits increased, on average, $21 billion per year in 2002 and 2003, and these figures were restrained by the 2001 recession. The effect on the U.S. economy from trade trends with China has clearly jumped onto a different plane.

The employment impact of a change in trade is determined by its effect on the trade balance, the difference between exports and imports at the detailed sectoral level.[2] Ignoring imports and counting only exports is like balancing a checkbook by counting deposits but not withdrawals. The many officials, policy analysts, and business leaders who ignore the negative effects of imports and talk only about the benefits of exports are engaging in false accounting.[3]

The labor content of U.S. trade is shown in the bottom half of Table 1. Between 1989 and 2003, the growth in U.S. exports to China created demand that supported 199,000 additional U.S. jobs. In the same period, the growth of imports displaced production that could have supported an additional 1,659,000 jobs (note that the growth of imports displaces domestic jobs, so the labor content of import growth is reported as a negative number in Table 1 and throughout this paper). As a result, growth in the U.S. trade with China eliminated a net 1,460,000 domestic job opportunities in this period.

These estimates include both the direct and the indirect effects of changes in trade flows on employment. Direct effects include the employment that could be supported by a given level of steel imports, while indirect effects include employment supported by the steel industry in other manufacturing sectors (e.g., machine tools), as well as jobs in service industries (e.g., computer programming or temporary help). Manufactured goods make up the vast majority of the United States' trade with China. In 2003, 79% of U.S. exports to China were manufactured goods, as were 99% of imports (**Table 2b**, Appendix). However, only 40% of the jobs supported by growth in exports and 79% of the jobs supported by growth in imports were in manufacturing in the period between 2001 and 2003. The differences between these two shares (29% for exports and 19% for imports) reflect differences in the relationships of the industries involved with production that supports jobs in sectors such as transportation, utilities, services, and government.[4]

Some economists reject the general notion that growing trade deficits can cause a net loss of job opportunities. Their most common argument is that employment levels are determined by macroeconomic policies such as monetary and fiscal policies and, most relevant to trade, exchange rates, and that, in the long run, the economy is usually at full employment. In fact, when the economy is operating at full employment, as in the late 1990s, growing trade deficits affect the *distribution* of jobs rather than the overall *number* of jobs in the economy. Growing trade deficits resulted in less employment in manufacturing and more jobs in non-traded goods such as services, retail trade, and construction (Bivens 2004).

In the long run, monetary and fiscal policies are usually adjusted to maintain full employment. If jobs in traded-goods industries pay better than the alternatives for workers affected by trade deficits, then the most important effects of growing trade deficits will be on the distribution of wages and incomes. Numerous studies have borne this out, demonstrating the significant negative effects that trade has had on the distribution of income over the last few decades of variable but generally growing trade deficits (TDRC report, chapter 3). In addition to offering higher wages for workers with comparable education and skills, manufacturing jobs also tend to offer better benefits.

On the other hand, the economy has operated well below potential output since 2001 because total employment growth has failed to keep up with growth in the working-age population (Price 2004). In this environment, the persistence of large and growing trade deficits has had a depressing effect on the overall level of employment, as well as its distribution across major sectors of the economy. The growth in the global U.S. trade deficit reduced manufacturing jobs by 1.78 million between 1998 and 2003 alone (Bivens 2004). In 2003 the manufacturing sector represented only 11.2% of the 129.93 million total U.S. jobs. But for the loss of these jobs in manufacturing, and in the economy as a whole, the manufacturing share of U.S. employment would have been 1.4 percentage points (12.3%) higher in 2003 than it actually was.

Unintended results of China's entry into the WTO

The claim that new trade agreements will create jobs and raise incomes in the United States has frequently been made by supporters of these agreements in both Republican and Democratic administrations. President Bush called the Senate's 2002 approval of fast-track trade negotiating authority (or Trade Promotion Authority, as it is now labeled) a "historic moment" that would lead to the creation of more jobs and more sales of American products abroad (Bush 2002a). Two weeks later, at his economic forum in Texas, he argued that "[i]t is essential that we move aggressively [to negotiate new trade pacts], because trade means jobs. More trade means higher incomes for American workers" (Bush 2002b).

The Clinton administration confidently forecast that the huge U.S. trade deficit with China would improve if Congress ratified the agreement to bring China into the WTO. President Clinton called the agreement "a win-win result for both countries" (Clinton 2000, 9). He pointed to growing exports to China that "now support hundreds of thousands of American jobs," and claimed, "these figures can grow substantially with the new access to the Chinese market the WTO agreement creates" (Clinton 2000, 10).

Others in the Clinton White House, such as Kenneth Liberthal, the special advisor to the President and senior director for Asia Affairs at the National Security Council, echoed Clinton's assessment:

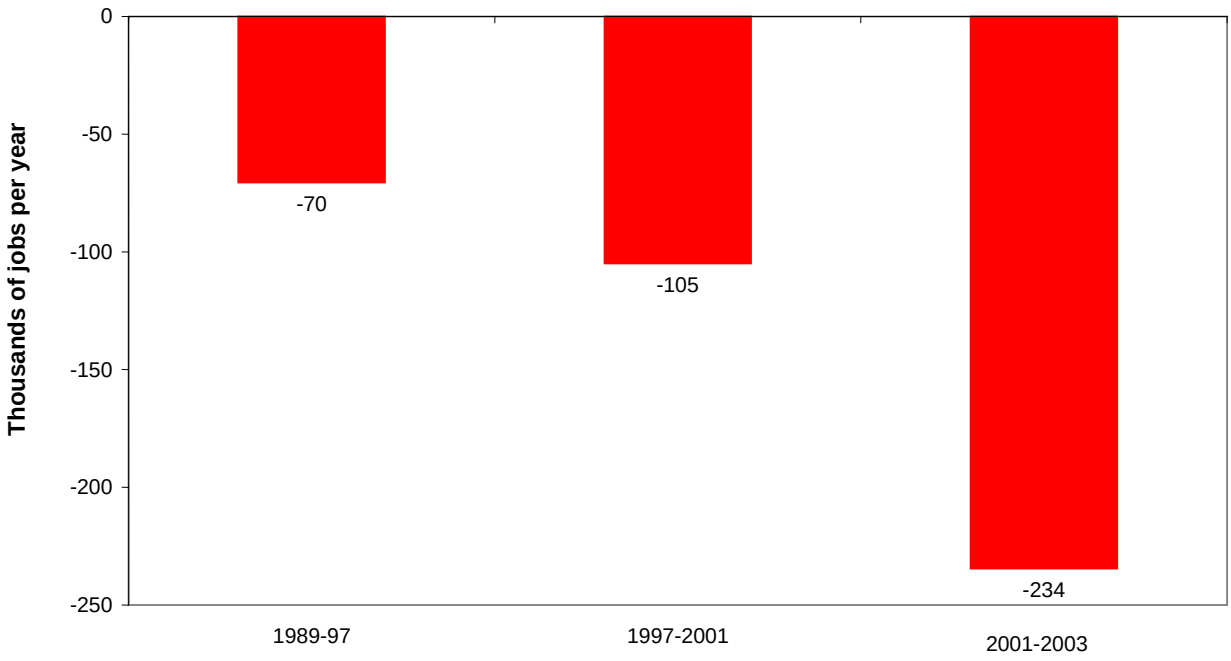
> Let's be clear as to why a *trade deficit might decrease in the short term*. China exports far more to the United States than it imports [from] the U.S.… [The trade deficit] will not grow as much as it would have grown without this agreement, and over time clearly it will shrink with this agreement (Lieberthal 1999, emphasis added).

In practice, the results of China's 2001 entry into the WTO have confounded these expectations. U.S. exports to China increased by $8 billion between 2001 and 2003, as shown in Table 1, an increase of

44%. U.S. imports increased by $50 billion, or 49%, on a base of imports that was nearly six times the value of exports in 2001. As a result, the trade deficit increased by 50% in this two-year period alone.

Figure 2 examines the changing employment effects of trade with China. Growing trade deficits eliminated production supporting about 70,000 jobs per year between 1987 and 1997, and 105,000 jobs per year between 1997 and 2001. Between 2001 and 2003, job displacement soared to 234,000 per year, more than twice the rate of the preceding four years. This change is particularly noteworthy because total U.S. domestic employment fell from 2001 to 2003, and the rate of growth of the U.S. trade deficit with all countries slowed. Between 1997 and 2001, the U.S. global trade deficit increased by 31% (7.8% per year). Between 2001 and 2003, it grew 10% (5.1% per year).

Figure 2:
Annual job loss before and after China entered the WTO in 2001



Trade and employment displacement in major industries

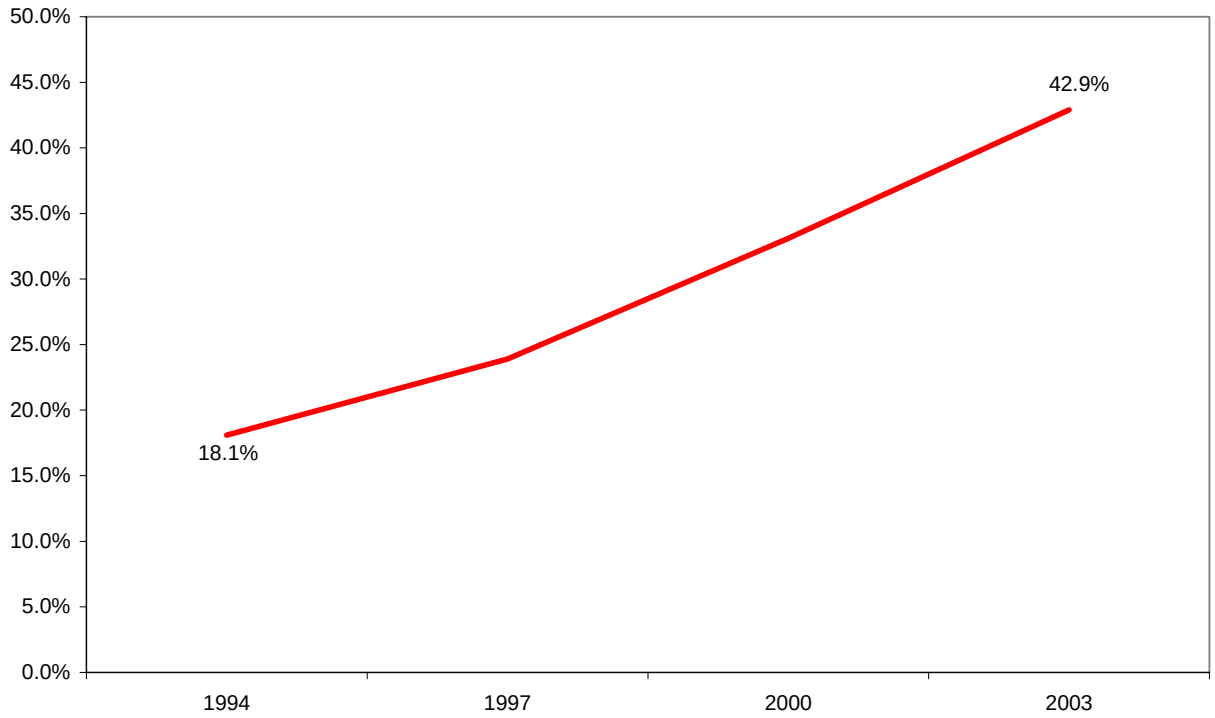
The remainder of this paper analyzes employment effects of growing trade deficits with China in distinct periods. Between 1989 and 1997, SIC-based industry definitions are used.[5] Between 1997 and 2003, NAICS-based industry definitions had to be utilized.[6] As a result, it is not possible to analyze changes in trade and employment at the industry level using consistent industry definitions for the entire 1989-2003 period. It is possible, however, to discern some important shifts in trade and employment-supporting production patterns related to the growth of the U.S.-China trade deficit in this period.[7]

Tables 3a and 3b (Appendix) report trade flows by major industry. As noted above, the great bulk of U.S. imports from China and a sizeable majority of U.S. exports are manufactured goods. In 1989 the manufacturing share was 91.5% of imports and 74.2% of exports (Table 2a, Appendix). Between 1989 and 1997, the total manufacturing deficit with China rose from -$6.6 billion to -$50 billion, a net change of $46.6 billion. This trend accelerated between 1997 and 2003, as shown in Table 2b, which reports trade flows in the new NAICS-based industries. The net export deficit in manufactured goods rose from -$50 billion to -$129 billion ($79 billion change) in this period.

The effects of growing U.S. trade deficits with China on employment are examined in **Tables 3a and 3b (Appendix)**. In manufacturing alone, the growth of *exports* between 1989 and 1997 supported 48,742 new jobs, while the growth of *imports* displaced production supporting -496,989 jobs, for a net loss of -448,247 job opportunities. Between 1997 and 2003 increased production for exports supported 63,000 jobs, while imports displaced 740,000 job opportunities, for a net loss of -677,000 manufacturing jobs. Note that the net loss of employment-supporting production accelerated, with 228,000 more manufacturing jobs displaced in the latter period, even though it was two years shorter. Employment displacement sped up further after China's WTO entry in 2001.

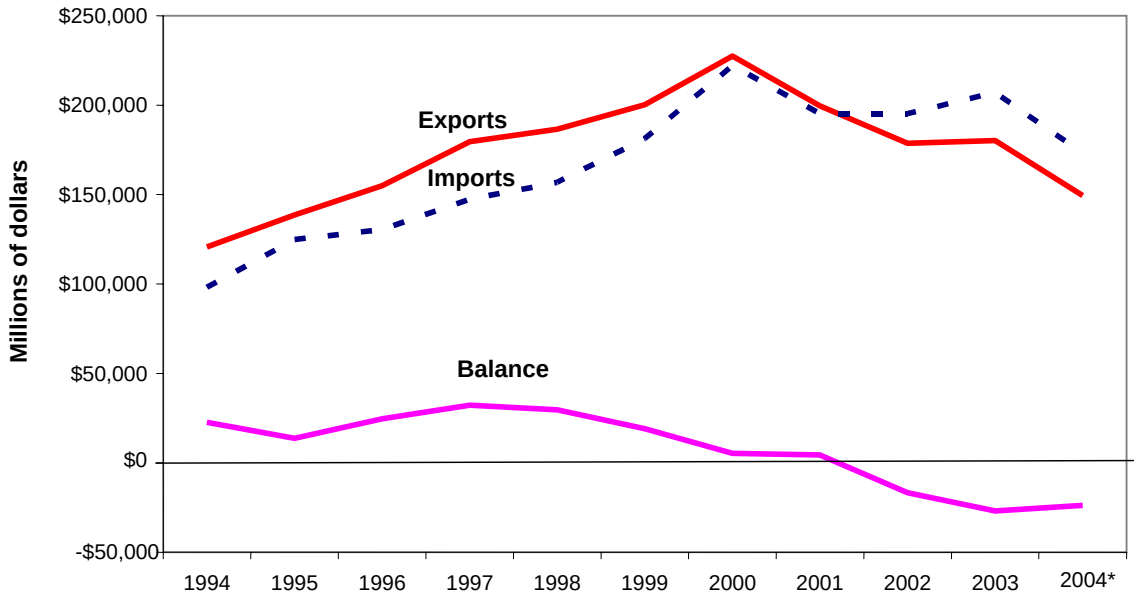
China has moved aggressively up the product ladder from labor-intensive non-durable products (e.g., clothes and shoes), to more sophisticated machinery and durable goods. As **Figure 3** shows, over the past decade a rapidly rising share of China's exports have consisted of electronics, machinery, and transport equipment.

Figure 3:
Rising share of China's exports are in electronics, machinery, and transport equipment



The rapid development of China's industrial base and research capacity is closely related to the recent decline in the United States' trade position in Advanced Technology Products (ATP). U.S. global trade flows in ATP are shown in **Figure 4**. Imports and exports grew steadily between 1994 and 2000, with the United States running a surplus throughout this period. Imports and exports dropped during the recession in 2001. Then imports leveled off and began to recover in 2002, but exports continued to decline in 2002 and stagnated in 2003. The U.S. deficit reached $27 billion in 2003, and it continues to grow.

Figure 4:
U.S. global trade in advance technology products, 1994 - 2004

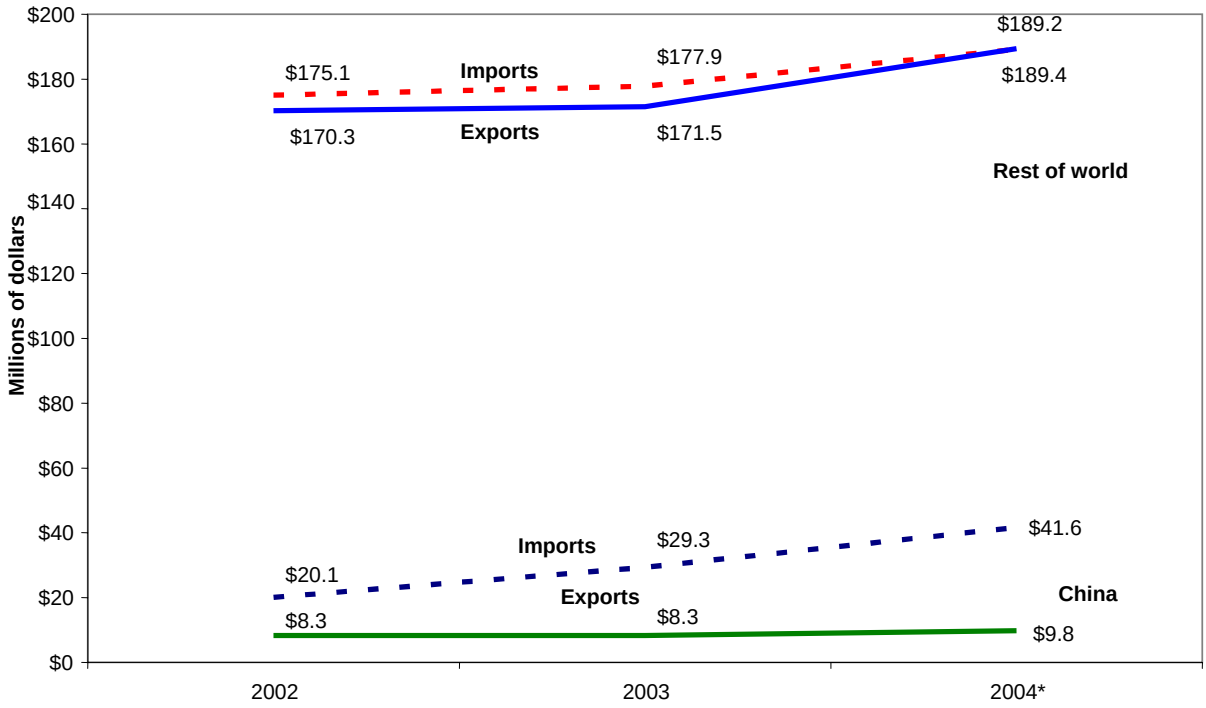


*Note: Data for 2004 reflect trends from January to September only
Source: US Census Bureau (2004a).

Figure 5 shows the relevance of these statistics. So far in 2004, the United States has eliminated a modest ATP trade deficit in with the rest of the world, but the deficit in ATP trade with China has continued to soar. In 2003, 89% of China's ATP exports to the United States were information and communication systems (e.g., computers and phones). U.S. imports of ATP products from China rose from $20 billion in 2002 to a $42 billion annualized rate for the first nine months of 2004. The fact that the United States has returned to an ATP trade balance with the rest of the world, even as the deficit with China continues to grow, belies the sanguine view that China exports "low-end" products to the United States while the United States exports "high-end" products to China.

Figure 5:

U.S. imports and exports in advanced technology products with China and rest of world, 2002 - 2004



*Note: Data for 2004 reflect trends from January to September only

Other manufacturing industries

In 1989, the United States' largest deficits were in apparel (-$2.9 billion), leather and leather products (-$977 million), household audio-video equipment (-$697 million), communications equipment (-$284 million), and rubber and plastic products (-$542 million). That same year, the United States had sizeable trade surpluses with China in chemicals ($1.029 billion) and nonelectrical machinery ($550 million), which included a small surplus in computer equipment ($83 million).

In 1997, the United States' net export deficit with China in manufactured goods swelled to $51 billion. Of this total, apparel still had the largest deficit (-$7.9 billion), but other sectors were catching up, including leather and leather products (-$6.6 billion), household audio-video equipment (-$3.5 billion) and communications equipment (-$1.2 billion), and rubber and plastic products (-$4.3 billion). Between 1989 and 1997, the U.S. surplus with China in chemicals was essentially flat ($1.0 billion) and what had been a surplus in nonelectrical machinery swung into a sizeable deficit (-$3.8 billion). The swing in nonelectrical machinery was driven by a surge in computer exports to the United States, resulting in a net export deficit of -$4.2 billion in this sector. These data show that China is rapidly climbing the product

ladder from low-wage, low-capital intensive industries to sectors requiring more capital, skills and technology, which have supported rapid income growth in China.[8] These trends continued and accelerated between 1997 and 2003, as shown in Table 2b, which reports trade flows in the new NAICS-based industries. The net export deficit in manufactured goods rose from $50 billion to -$129 billion in this period. The largest deficits (-$22.6 billion) were now in nonelectrical machinery, most of it computers (-$17.6 billion). Other sectors with large deficits included audio and video equipment (-$12.2 billion), communications equipment (-$5.93 billion), and semiconductors, which were elevated in the new NAICS structure to full subsector status. The trade deficit in semiconductors nearly tripled between 1997 and 2003 alone (from -$2.2 billion to -$6.4 billion). Net exports in leather goods soared to -$12.9 billion in 2003, exceeding the apparel deficit (-$10.6 billion). Furniture is another sector where the trade deficit has soared in the past six years, more than quadrupling from -$1.6 billion in 1997 to -$7.6 billion. China has widely diversified and expanded the base of its industrial structure and exports to the United States over the past 14 years, moving rapidly up the production technology ladder as it has done so.

Trade flow trends in some of these sectors are shown in **Figures 6 through 11 (Appendix)**, which show the growth of imports, exports and the trade balance in each sector. The examples fall into two broad groups, both characterized by rapid growth of U.S. imports from China and swiftly expanding trade deficits. U.S. exports are less than $1 billion and largely stagnant in communications equipment (**Figure 6**), audio video equipment (**Figure 7**), computer equipment (**Figure 8**) and auto parts (**Figure 9**). There is more evidence of two-way trade in semiconductors, where exports rose from $0.5 billion in 1989 to $2.5 billion in 2003 (**Figure 10**), and the trade deficit has leveled off since 2000 as a result. The modest growth in U.S. exports of nonelectrical machinery to China (**Figure 11**) was not sufficient to thwart a doubling of the trade deficit in 2003, when China's exports soared and imports from the United States failed to keep pace. The rapid growth of imports and trade deficits in five of the six sectors covered in these figures is remarkably similar.

The employment effects of trade with China

The distribution of job losses between 1989 and 1997 closely follows changes in trade patterns, with a few major exceptions as shown in Table 3a. The largest losses of job-supporting production in this period occurred in leather products (-66,000 job opportunities) apparel (-55,000 jobs), rubber and plastics (-38,000 jobs), furniture (-15,000 jobs), and electronic machinery (-69,000 jobs) — which included audio/video equipment (-18,500 jobs) and communications equipment (-3,700 jobs). The textile industry also experienced a major indirect effect, as it suffered a loss of output that would have supported 24,000 jobs, due to the growth of apparel imports. Note that during this period the apparel deficit was more than

10 times as large as the deficit in textiles, yet both industries suffered a similar amount of employment displacement.[9]

The effects of China's movement up the product ladder are immediately apparent in Table 3b, which examines the employment effects of trade between 1997 and 2003. For example, between 2001 and 2003, loss of job opportunities in apparel (-24,000), textiles (-23,000), leather products (-14,000) and rubber and plastics (-15,000) fell off sharply compared to the 1989-97 period. (Note that the manufacturing trade deficit with China increased by about $45 billion in each of these periods, although the first is eight years long while the second lasted only two years.) Job displacement increased sharply in furniture (-39,000) and nonelectrical machinery (-50,000), including nearly a tripling in computers (-30,000). The largest amount of employment displacement in this period occurred in electronic machinery (-91,000 jobs), which included audio/video equipment (-28,000), communications equipment (-11,000, a near tripling), and semiconductors (-25,000).

Although the loss of job-supporting production in textiles and apparel sped up after China entered the WTO in 2001, the total remained well below levels that prevailed in the 1989-1997 base period. Since 2001 the displacement of production that could support jobs has grown most rapidly in middle- and high-technology sectors such as furniture, computers, audio/video and communications equipment, and semiconductors. China's move up the technology ladder in the opening years of the 21st century has been truly breathtaking.

These results are shown in **Table 4**, which summarizes, by industry, the jobs created or displaced by trade. The net job displacement in these periods goes from 312,000 between 1989 and 1997 to 677,000 from 1997 to 2003, even though the second time period is far shorter than the first. The job displacement estimates in the first three columns were discussed above. The last three columns show the shares, by sector, of the total job losses that are associated with the growth of trade deficits with China during the two periods. Several major shifts are notable. One is the decline in the importance of apparel; however, employment displacement in this sector has increased again in the past two years and is likely to expand rapidly with the January 2005 removal of apparel quotas, as required under the terms of the WTO agreements. The furniture share triples from the earlier to the latter period. Rubber and leather products decline precipitously. The share of computers more than triples and audio/video equipment doubles. Communications equipment rises even more rapidly, though its share remains small. These results provide clear evidence of China's growing technological prowess and the rapid accumulation of skills in its labor force.

Table 4:
Net employment displacement as a share of trade-related job losses by industry

	Number of jobs			Share of total manufacturing job loss due to trade		
	1989-1997	1997-2001	2001-2003	1989-1997	1997-2001	2001-2003
Textiles	24,057	12,277	23,243	5.4%	3.9%	6.4%
Apparel	55,097	12,291	24,229	12.3%	3.9%	6.6%
Furniture	15,395	38,766	39,561	3.4%	12.4%	10.8%
Rubber products	38,227	13,575	15,097	8.5%	4.3%	4.1%
Leather & leather prods	66,077	30,956	14,226	14.7%	9.9%	3.9%
Computer & office equip	12,046	11,702	29,600	2.7%	3.7%	8.1%
Household AV	18,573	17,633	28,182	4.1%	5.6%	7.7%
Comm. equipment	3,705	5,284	11,051	0.8%	1.7%	3.0%
Semiconductors	--	20,782	25,437	--	6.7%	7.0%
Misc. mfg. goods	78,766	35,575	36,924	17.6%	11.4%	10.1%
Total mfg	448,247	312,507	364,778	100.0%	100.0%	100.0%

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Sectoral details on the employment effects of trade

Tables 5a and 5b (**Appendix**) provide further details on the employment effects of trade, using the BLS input-output model. These tables shed light on a few other aspects of the evolving U.S. trade relationship with China.

Table 5a examines the effects of trade on in 192 SIC-based industries between 1989 and 1997. Most of the important results for the manufacturing sector have been addressed in the discussion of Table 3a, above. Additional detail is provided here about effects on service sectors of the growing U.S. China deficit. These indirect effects result from changes in the purchases of services by manufacturing and other commodity industries that produce the trade-competing goods. Direct production in this paper covers only commodities that are part of goods trade. Direct trade in services is not included in this study, for reasons discussed in the Methodology section.

Trade-related employment changes occurred in both high- and low-wage business service sectors In the former, production supporting 13,000 jobs was displaced in the personnel supply (i.e., temporary help) industry, which offers many workers wages lower than those of their industrial counterparts and few benefits. On the other higher-wage side of the scale, employment displacement included 3,200 depository institution jobs, 1,400 investment banking jobs, 1,500 computer and data processing jobs (though many of

these could have been data-entry personnel), 12,000 miscellaneous business service jobs, 2,800 legal service jobs, 2,900 management and public relations jobs, 3,200 accounting jobs, and 5,200 job training positions, along with a similar number of positions in many other service industries.

New levels of precision and detail about the impact of trade in service industries between 1997 and 2003 are provided in the NAICS-based industry data shown in Table 5b. At least two of the new service industries include changes of direct trade, as reported in the underlying (Harmonized Tariff System) statistics on goods trade collected by the Census Bureau. These are newspaper and book publishing (production supporting 1,900 jobs displaced between 1997 and 2001, and 2,200 jobs displaced between 2001 and 2003) and software publishers (-200 and -400 jobs in the two periods, respectively). The analogous business service sectors discussed above continued to experience job losses on a similar scale in the later periods. Newly identified sectors include architecture and engineering services (-2,800 jobs between 1997 and 2001, and -3,400 jobs between 2001 and 2003); management, scientific, and technical consulting (-2,100 and -2,500 jobs, respectively); and scientific research and development and related services (-5,200 and -6,400 jobs). The displacement of domestic production in these advanced scientific, technological, and research industries illustrates how the demise of manufacturing brought on by growing trade deficits with China is eroding the foundations for U.S. technological leadership in many industries.

Two critical transportation equipment industries, motor vehicles and aerospace, offer a good case in point. Businesses in both of these sectors strongly supported China's entry into the WTO, claiming that the growth of the Chinese markets would increase demand for U.S. products. However, those investments have not increased U.S. employment in tandem with growing trade with China, as shown in **Tables 5a and 5b**. Between 1989 and 1997, the growth in the U.S. trade deficit with China had essentially no effect on in the auto industry (industry 56 in the tables). Meanwhile the aerospace sector (industry 57) enjoyed substantial gains (8,100 jobs) due to its growing trade surpluses with China. However, by 2003 changing trade flows resulted in a net decline in employment-supporting production in both sectors. For motor vehicles, the NAIC-based data provide details on vehicle assembly, stamping, and parts trade. Overall, the industry lost production supporting 6,000 jobs between 1997 and 2001, and 5,000 jobs between 2001 and 2003, largely because of a surge in auto parts imports from China.

In aerospace, the growth in the job-creating trade surplus came to an end, and employment changes essentially ended by 2003. While the industry still maintains a substantial overall surplus in trade with China, the surplus has effectively stopped growing. It could become negative in the years ahead if parts imports begin to grow, as was the case for autos in 2003. If the United States cannot compete with China

in aerospace, it is not clear which sectors could provide the foundation for closing the trade gap in the future.

Employment displacement in all 50 states

The growth of trade deficits with China displaced production supporting jobs in all 50 states and the District of Columbia throughout the study period (Tables 6a and 6b, Appendix). Exports from every state have been offset by faster-rising imports. These tables provide detailed estimates of job gains due to the growth in exports, jobs displaced due to growing in imports, and the trade balance for each state. In every case, many more jobs are lost due to growing imports than are gained through increasing exports.

Net employment displacement estimates between 1989 and 1997 (Table 6a) range from a low of -334 in Alaska to a high of -81,800 in California. Other hard-hit states include Texas, New York, Pennsylvania, Illinois, North Carolina, Florida, and Ohio, each with more than 20,000 jobs lost. These states all have high concentrations of industries where a large number of plants have moved to China (textiles and apparel, furniture, computers and electrical equipment, semiconductors, and motor vehicle parts). Manufacturing industries suffered 77.8% of the trade-related jobs displacement between 2001 and 2003 -- 364,800 good manufacturing jobs in those two years alone.

Net displacement of production-supporting employment was also negative for every state and the District of Columbia between 1997 and 2003 (Table 6b). The magnitude of job losses in the states remained generally similar in each subperiod (Table 6b), though a few states moved up or down a notch or two between the two periods of 1997-2001 and 2001-2003. For example, between 2001 and 2003 North Carolina (number 8 to number 6) and Georgia (number 10 to number 9) both moved slightly up the list. States that fell in the rankings from the earlier to the latter period include Ohio, Indiana, and Wisconsin. However, each of these states experienced large and significant job losses in both periods (e.g., Wisconsin, the lowest ranking state in this group, lost 12,300 job opportunities in the four years from 1997 to 2001, and 11,300 in the two years from 2001 to 2003. Detailed state-by-state information on employment displacement by industry is available in a separate document that is also available on the Web sites where this paper is available: www.uscc.gov and www.epinet.org.

While job displacement in most states was modest compared to total employment, it is important to remember that the promise of new U.S. jobs was the principal justification for China's entry into the WTO.

Employment multipliers

The methodology used in this study is based on detailed input-output relationships covering 184 or 192 industries (see Appendix). The direct and indirect effects of a change in output in each of these sectors interacts to determine the employment content of a given vector (set) of trade flows over these industries at a particular time point. There is an implicit multiplier for each sector, which reflects the direct and indirect effects of a unit's worth of output in that industry, and all industries that are indirectly affected by changes in the production of that good. Thus in any given year the effects of imports, exports, or the trade balance will depend on the mix of goods traded. The entire 184 x 184 or 192 x 192 employment requirements table is needed to assess the impact of a particular change in trade such as, for example, a million dollar increase in exports of aircraft or a million dollars worth of computer imports.

Given these caveats, weighted average trade multipliers for U.S.-China trade for various years are reported in **Table 7**. Average export and import multipliers were relatively stable throughout the study period. Export multipliers vary between 9.8 and 11.3 thousand jobs supported per billion 1996 dollars in trade (again, depending on a given vector of trade flows). Import multipliers range between 12.0 and 13.5 thousand jobs per billion dollars. Import multipliers are larger than export multipliers because the United States tends to import labor-intensive goods, and export more skill- and capital-intensive goods. Labor-intensive goods generally require less skilled labor and pay lower wages. Therefore more jobs are created per billion dollars worth of production in such industries, everything else being equal.

Table 7:
Trade multipliers (in thousands of jobs per billion dollars of trade)

	1989	1997†	1997*	2001	2003
U.S. exports	11.3	10.0	10.5	9.8	10.1
U.S. imports	-13.5	-12.5	-12.9	-12.4	-12.0
U.S. trade balance	-15.6	-13.1	-13.5	-13.0	-12.4

†1997 results for SIC-based analysis.
*1997 results for NAICS-based analysis.

U.S. trade balance multipliers are somewhat more volatile, and are larger than either import or export multipliers. Although the reasons for this discrepancy are not well understood, one hypothesis is that the share of U.S. trade deficits in the most labor-intensive goods has declined over time, as illustrated in Figure 3. This is consistent with the steady decline in the trade balance multiplier over time, as China has increased its competitiveness in more advanced products.

Questions for future research

This analysis can and should be extended in a number of directions. First, the effects of changes in trade flows by race, gender, and income strata can be prepared using CPS population surveys. This work can be disaggregated to look at the implications of trade for these demographic groups. For example, to what extent has the growth of apparel imports from China disproportionately displaced production supporting the employment of women and minorities?

Second, the input-output approach developed here could be used to develop new estimates of the effects of trade (both imports and exports) at the state level. Currently, the government publishes only export data at the state and regional levels. No data are released on the location of import-competing sectors where trade is displacing domestic production. A thorough examination of the advantages and disadvantages of each of the available approaches to this issue should be carried out.

Third, labor content studies of the type utilized in this paper continue a long tradition first developed by Wassily Leontief and Faye Duchin. However, these studies have been criticized by economists using other types of statistical models. A thorough review of the literature and a reassessment of the strength and weakness of labor content studies is needed.

Finally, ongoing engagement with researchers at the U.S.-China Economic and Security Review Commission on the questions covered here, and on related issues, will continue to generate important new areas for research.

Conclusion

Growing trade deficits with China have displaced production supporting 1.5 million U.S. jobs since 1989. The rate of job displacement is accelerating, especially since China entered into the WTO. China's entry into the world trading system was supposed to open up its vast domestic markets to products from around the world, and the United States engaged in extensive negotiations with China to ensure that it obtained its share of these benefits. These benefits have yet to materialize. Instead, multinational companies from around the world have used the protections for investment and intellectual property provided by the WTO to rapidly expand investment, production, and exports from that country. The United States remains China's primary market for exports. In just 15 years China has rapidly transformed its export profile from one dominated by clothing, shoes, and plastic products, to one in which electronics, machinery, transportation equipment, other fabricated metals, chemicals, and medical equipment account for more

than half of exports. China's leading-edge industries are gaining increased market shares in the motor vehicle and aerospace sectors, which have provided the most durable foundations for the United States' industrial base for generations. That shift, in turn, reduces the demand for high-technology workers and highly skilled business professionals in the United States. It is hard to overstate the challenges posed by this export behemoth.

* * *

Appendix

Methodology

This analysis utilizes an input-output model to estimate the relationships between changes in trade flows and production that could support domestic employment. The analysis covers trends in goods trade, which is dominated by manufactures. Services are not considered because of problems with the data, and because many of the services traded involve returns to capital and intellectual property that have little or no direct effect on employment. In addition, goods trade dominates the nation's international accounts.

This study uses the model developed in Rothstein and Scott (1997a and 1997b). This approach solves four problems that are prevalent in previous research on the employment effects of trade. Some studies look only at the effects of exports and ignore imports. Some studies include foreign exports (transshipments) — goods produced outside the United States and shipped through this country to other nations— as U.S. exports. The trade data used in many studies is usually not adjusted for inflation. Finally, a single employment multiplier is often applied to all industries, despite differences in labor productivity and utilization.[10]

The model used here is based on the Bureau of Labor Statistics' employment requirements tables, which were derived from the U.S. input-output tables that are published by the Bureau of Economic Analysis. These tables are adjusted to 1997 price and productivity levels (BLS 2004a), in real, chain-weighted 1996 dollars. This model is used to estimate the direct and indirect effects of changes in goods trade flows in each of 184 or 192 industries. This study updates the 1987 input employment requirements table used in earlier reports in this series (Rothstein and Scott 1997a, 1997b; Scott 1996).

As explained above, the analysis in this report is broken into two separate periods because of changes from the SIC to the NAICS system in 1997. For the 1989 and 1997 period we examine up to 192 SIC-based industries, and in the 1997 to 2003 period we use the 184 NAICS-based sectors. Only one (separate) employment requirements table was used in each portion of the analysis. A base year with 1997 employment requirements in both models was used. This assumption was needed to control for the effects of technology. This technique isolates the effects of trade on employment from pure technology effects.

This analysis requires three-digit, SIC-based industry trade data (U.S. Bureau of the Census 1996 and 2004b), deflated with industry-specific, chain-weighted price indices (BLS 2001)[11], which were updated using industry-specific producer price indexes (BLS 2004b)[12]. These data were Concorde from HS to SIC (1987) classifications using conversion tables provided by the Census Bureau. Trade data were downloaded from the U.S. International Trade Commission (2004) Web site in SIC format. The SIC data are then concorded into the BLS sectors using sector-plans from the BLS (2004a). State-level employment effects are calculated by allocating imports and exports to the states on the basis of their share of three-digit, industry-level employment for 2000 (U.S. Census Bureau 2001). An analogous procedure is used to prepare trade data for analysis that is organized according to a NAICS-based industry structure.

The trade data were converted into chain-weighted 1996 dollars. A domestic employment requirements table for a particular base year was used to estimate the employment effects of trade in each year of the analysis, holding technology constant. The domestic employment requirement calculates the labor required to produce all of a given product within the United States. Thus, it reflects the complete labor content of output. The base year of 1997 was chosen for this study because it provided a natural bridge between the SIC-based analysis and the NAICS model which overlapped in that year. Detailed results for each of the 184 or 192 industries were then aggregated into major industries for presentation in Table 3.[13]

CPS data on employment by industry by was collected for each of the detailed sectors in the model. These data were used to calculate each state's share of national employment in each industry. The resulting matrix was used to calculate the effects of changes in trade flows on employment in each of the states and the District of Columbia. A mathematical summary of the steps used in this analysis is included in the Appendix to this report.

Mathematical presentation of the model

The model uses matrix algebra. It contains four basic steps. The core model uses a 184 (NAICS) or 192 (SIC) sector employment requirement matrix prepared by the BLS Office of Occupational Statistics and Employment Projections. This matrix is now available on the BLS Employment Projections website.

I. Convert data from HS to SIC and NAICS formats. Annual history disks from the dept. of Commerce, Census trade series (IM 145 and EX 145 series) can be used for this purpose. Each disk contains data and instructions for converting data from HS to SIC formats. For this project, concorded data were downloaded from the U.S.I.T.C. (2004).

II. Convert data from SIC to BLS formats. Define the following matrices:
SIC = raw trade data in NAICS or SIC format, in current dollars CONV = SIC to BLS conversion table.
BLSTRADE = trade data in BLS format (184 or 192 sectors) in nominal dollars

DEFLATORS = industry deflators for converting each sector into 1996 dollars
BLSTRADE92 = trade data in BLS format in 1996 dollars

note that trade data includes 1 x n vectors of data for:YR 1 and YR 2
DOMEXPORTS = domestic exports
CONSIMPORTS = consumption imports
NETEXPORTS = DOMEXPORTS - CONSIMPORTS,
all reported for both YR 1 and YR 2

then, in matrix form:

SIC (or NAICS) x CONV = BLSTRADE
BLSTRADE x DEFLATORS = BLSTRADE96

III. Define the following matrices:

INOUT = BLS labor requirements table (a 192 x 192 or 184 x184 matrix)
JOBEQUIV = labor equivalents of DOMEXPORTS, CONSIMPORTS and NETEXPORTs (1 x 192 or 184 vectors for YR 1 and YR 2)
DELTAJOBS = a 3 x 192 matrix of changes in DOMEXPORTS, CONSIMPORTS & NETEXPORTS between YR 1 and YR 2

then:
JOBEQUIV = INOUT x BLSTRADE96
DELTAJOBS = DOMEXPORTSYR 2 – DOMEXPORTSYR 1 and etc.(using simple subtraction for each), and etc. for CONSIMPORTS and NETEXPORTS

IV. Obtain state data by using the BLS CES files for 2000 to estimate employment by industry for each of the 50 states, so define:

STATESHARES = shares of each state for employment in each industry (50 x 192 matrix or 184)
STATEDETAILS = employment by state due to DOMEXPORTS2002 and etc. and DELTAJOBS
STATESUM = simple SUMS over all industries for each of 50 states of STATEDETAILS

then:
STATEDETAILS = STATESHARES x DELTAJOBS and
calculate STATESUM
This model will also be used to estimate flows of imports and exports at the state level, based on the distribution of employment by industry in each state.

Appended Tables

Table 2a:
Trade with China by industry (millions of dollars)

	1989			1997		
	Exports	Imports	Net Ex	Exports	Imports	Net Ex
U.S.-China total	**$5,833**	**-$11,929**	**-$6,096**	**$13,106**	**-$63,406**	**-$50,300**
Industry						
Agriculture, forestry, fisheries	1,448	-354	1,094	1,208	-478	730
Mining	13	-633	-620	199	-322	-123
Construction	0	0	0	0	0	0
Manufacturing	4,322	-10,917	-6,594	11,486	-62,445	-50,959
Mfg. Industry						
Food and kindred products	25	-198	-173	617	-442	175
Tobacco	26	0	26	2	0	2
Textile mill products	47	-331	-285	56	-622	-566
Apparel and related products	2	-2,994	-2,993	10	-7,799	-7,789
Lumber and wood products, except furniture	190	-127	63	50	-492	-441
Furniture and fixtures	2	-83	-80	16	-1,529	-1,513
Paper and allied products	177	-65	111	362	-444	-82
Printing, publishing, and allied products	10	-38	-28	25	-315	-291
Chemicals and allied products	1,269	-240	1,029	2,058	-1,076	982
Petroleum refining and related products	11	-27	-16	80	-111	-30
Rubber and miscellaneous plastics products	20	-562	-542	83	-4,346	-4,264
Leather and leather products	7	-983	-977	47	-6,680	-6,633
Stone, clay, glass, and concrete products	18	-165	-148	86	-1,286	-1,200
Primary metal products	363	-203	159	381	-1,087	-706
Blast furnaces and basic steel products	255	-69	185	47	-415	-367
Fabricated metal prod exc mach & transp equipment	88	-359	-271	304	-1,690	-1,386
Machinery, except electrical	865	-315	550	2,087	-5,929	-3,843
Computer and office equipment	147	-64	83	321	-4,509	-4,188
Electrical & electronic mach, equip, & supplies	240	-1,825	-1,585	2,024	-13,590	-11,565
Household audio and video equipment	13	-710	-697	35	-3,501	-3,466
Communications Equipment	65	-350	-284	574	-1,775	-1,200
Transportation equipment	660	-47	613	2,417	-644	1,773
Motor vehicles and equipment	45	-11	35	349	-257	92
Aerospace	611	-16	596	2,058	-43	2,016
Scientific & prof instr; photograph & opt gds etc	266	-153	113	508	-2,442	-1,933
Miscellaneous manufactured commodities	38	-2,200	-2,162	273	-11,919	-11,646
Transportation	0	0	0	0	0	0
Communications	0	0	0	0	0	0
Utilities	0	0	0	0	0	0
Trade	0	0	0	0	0	0
FIRE	0	0	0	0	0	0
Services	0	0	0	0	0	0
Government	0	0	0	0	0	0
Special Industries	49	-25	25	212	-160	52
TOTAL	**$5,833**	**-$11,929**	**-$6,096**	**$13,106**	**-$63,406**	**-$50,300**
Ag, forestry, and fisheries	24.8%	3.0%	-18.0%	9.2%	0.8%	-1.5%
Manufacturing share of total	74.1%	91.5%	108.2%	87.6%	98.5%	101.3%

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 2b:
Trade with China by industry (millions of dollars)

Industry	1997			2001			2003		
	Exports	Imports	Net Ex	Exports	Imports	Net Ex	Exports	Imports	Net Ex
Agriculture, forestry, fisheries	$1,172	-$505	$666	$1,361	-$731	$630	$3,421	-$1,186	$2,235
Mining	163	-286	-123	85	-265	-180	145	-187	-42
Construction	0	0	0	0	0	0	0	0	0
Manufacturing	10,976	-60,885	-49,909	15,372	-100,478	-85,107	20,556	-150,106	-129,551
Mfg. industry									
Food and kindred products	534	-429	106	754	-582	172	1,097	-952	144
Tobacco	3	0	2	0	-8	-8	1	-5	-4
Textile mill products	59	-1,540	-1,480	89	-2,125	-2,036	181	-3,723	-3,541
Apparel and related products	9	-7,248	-7,239	28	-8,394	-8,366	11	-10,613	-10,603
Lumber and wood products, except furniture	35	-440	-405	102	-836	-734	176	-1,115	-938
Furniture and fixtures	15	-1,570	-1,555	18	-4,580	-4,562	22	-7,649	-7,627
Paper and allied products	397	-340	57	489	-652	-163	594	-1,048	-454
Printing, publishing, and allied products	26	-337	-311	41	-684	-643	60	-1,000	-941
Chemicals and allied products	1,989	-1,159	829	2,105	-1,696	410	3,190	-2,263	928
Petroleum refining andrelated products	93	-137	-44	73	-197	-124	73	-209	-136
Rubber and miscellaneous plastics products	83	-1,651	-1,568	197	-2,655	-2,458	268	-3,750	-3,481
Leather and leather products	48	-9,158	-9,111	83	-11,727	-11,644	102	-12,987	-12,885
Stone, clay, glass, and concrete products	164	-1,388	-1,224	191	-2,286	-2,096	154	-2,747	-2,593
Primary metal products	277	-648	-372	253	-879	-626	839	-1,000	-161
Fabricated metl prod exc mach & transp equipment	315	-1,818	-1,503	275	-3,656	-3,381	447	-5,337	-4,891
Machinery, except electrical	2,189	-6,059	-3,870	3,477	-12,489	-9,012	3,808	-26,345	-22,536
Commercial and service industry	47	-1,634	-1,587	145	-1,860	-1,715	189	-3,283	-3,094

Table 2b, page 2

Industry	1997			2001			2003		
	Exports	Imports	Net Ex	Exports	Imports	Net Ex	Exports	Imports	Net Ex
Computer equipment	$308	-$3,332	-$3,024	$1,182	-$8,174	-$6,992	$1,011	-$18,642	-$17,630
Engines, and turbines	223	-92	131	232	-144	88	183	-245	-62
Industrial machinery	265	-46	219	377	-101	276	515	-229	286
Electrical & electronic machines, equipment, and supplies	1,907	-13,527	-11,619	4,092	-27,337	-23,245	5,952	-43,184	-37,232
Audio and video equipment	16	-3,515	-3,500	93	-6,921	-6,829	128	-12,305	-12,177
Communications equipment	530	-1,541	-1,011	814	-3,387	-2,573	562	-6,488	-5,927
Navigational instruments, optical media	466	-833	-367	933	-1,358	-425	1,486	-2,184	-698
Semiconductors	562	-2,736	-2,175	1,799	-6,514	-4,714	3,239	-9,609	-6,369
Transportation equipment	2,507	-723	1,784	2,669	-1,782	887	3,029	-2,789	240
Motor vehicles and equipment	372	-347	26	266	-1,054	-788	586	-1,791	-1,205
Aerospace	2,125	-44	2,082	2,386	-82	2,304	2,422	-91	2,331
Medical equipment	31	-504	-473	96	-751	-655	124	-1,055	-931
Miscellaneous manufactured commodities	295	-12,210	-11,915	339	-17,161	-16,822	427	-22,336	-21,908
Transportation	0	0	0	0	0	0	0	0	0
Communications	0	-1	-1	0	-6	-6	1	-5	-4
Utilities	0	0	0	0	0	0	0	0	0
Trade	0	0	0	0	0	0	0	0	0
FIRE	0	0	0	0	0	0	0	0	0
Services, trade, and special industries	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0
Special industries	199	-149	50	1,266	-228	1,038	1,995	-215	1,781
Total	**$12,509**	**-$61,826**	**-$49,317**	**$18,083**	**-$101,709**	**-$83,626**	**$26,118**	**-$151,699**	**-$125,581**
Ag, forestry and fisheries share of total	9.37%	0.82%	-1.35%	7.52%	0.72%	-0.75%	13.10%	0.78%	-1.78%
Manufacturing share of total	87.74%	98.48%	101.20%	85.01%	98.79%	101.77%	78.70%	98.95%	103.16%

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 3a
Jobs created or displaced in major industries due to growing trade with China

	Growth in:		
	Domestic exports 1989 - 1997	**Consumption imports 1989 - 1997**	**Net exports 1989 - 1997**
U.S.-China total	**65,432**	**-629,318**	**-563,886**
Industry			
Agriculture, forestry, fisheries	-124	-11,400	-11,524
Mining	859	-2,459	-1,600
Construction	442	-2,716	-2,274
Manufacturing	48,742	-496,989	-448,247
Mfg. industry			
Food and kindred products	2,115	-3,755	-1,640
Tobacco	-30	-2	-32
Textile mill products	377	-24,433	-24,057
Apparel and related products	203	-55,300	-55,097
Lumber and wood products, except furniture	-579	-7,684	-8,263
Furniture and fixtures	250	-15,645	-15,395
Paper and allied products	1,332	-7,966	-6,634
Printing, publishing, and allied products	957	-11,549	-10,592
Chemicals and allied products	2,895	-11,351	-8,455
Petroleum refining and related products	104	-529	-424
Rubber and miscellaneous plastics products	1,739	-39,966	-38,227
Leather and leather products	428	-66,505	-66,077
Stone, clay, glass, and concrete products	896	-11,032	-10,136
Primary metal products	1,914	-12,674	-10,760
Blast furnaces and Basic Steel Products	-398	-4,468	-4,866
Fabricated metl prod exc mach & transp equipment	3,975	-19,623	-15,648
Machinery, except electrical	8,628	-28,372	-19,745
Computer and office equipment	710	-12,756	-12,046

Table 3a, page 2

	Growth in:		
	Domestic exports 1989 - 1997	**Consumption imports 1989 - 1997**	**Net exports 1989 - 1997**
Electrical & electronic mach, equip, & supplies	9,785	-79,000	-69,214
Household audio and video equipment	184	-18,757	-18,573
Communications Equipment	1,986	-5,691	-3,705
Transportation equipment	9,593	-4,159	5,434
Motor vehicles and equipment	1,113	-1,515	-402
Aerospace	8,415	-336	8,078
Scientific & prof instr; photograph & opt gds etc	2,052	-16,569	-14,518
Miscellaneous manufactured commodities	2,110	-80,876	-78,766
Transportation	2,855	-18,803	-15,948
Communications	503	-4,448	-3,945
Utilities	506	-3,499	-2,993
Trade	617	-4,430	-3,814
FIRE	1,498	-11,282	-9,784
Services	8,956	-68,372	-59,415
Government	578	-4,921	-4,342
Special industries	0	0	0
TOTAL	**65,432**	**-629,318**	**-563,886**
Ag, forestry and fisheries share of total	-0.2%	1.8%	2.0%
Manufacturing share of total	74.5%	79.0%	79.5%

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 3b:

Jobs created or displaced due to growing trade with China, number of jobs

Industry	1997-2001 Growth in:			2001-2003 Growth in:		
	Domestic exports	**Consumption imports**	**Net exports**	**Domestic exports**	**Consumption imports**	**Net exports**
Agriculture, forestry, fisheries	4,057	-6,805	-2,748	29,609	-10,666	18,944
Mining	108	-1,954	-1,846	1,032	-1,688	-656
Construction	272	-2,552	-2,280	584	-3,179	-2,595
Manufacturing	29,275	-341,783	-312,507	34,161	-398,939	-364,778
Mfg. industry						
Food and kindred products	1,878	-1,995	-118	1,926	-2,955	-1,029
Tobacco	-2	-10	-12	1	2	3
Textile mill products	603	-12,880	-12,277	1,220	-24,464	-23,243
Apparel and related products	182	-12,473	-12,291	-112	-24,117	-24,229
Lumber and wood products, except furniture	581	-8,502	-7,922	817	-7,092	-6,275
Furniture and fixtures	92	-38,859	-38,766	106	-39,667	-39,561
Paper and allied products	725	-6,971	-6,246	968	-7,947	-6,979
Printing, publishing, and allied products	390	-6,347	-5,957	613	-6,986	-6,374
Chemicals and allied products	1,074	-6,615	-5,541	3,744	-7,988	-4,244
Petroleum refining andrelated products	44	-367	-323	189	-387	-198
Rubber and miscellaneous plastics products	1,271	-14,846	-13,575	1,241	-16,339	-15,097
Leather and leather products	329	-31,286	-30,956	42	-14,268	-14,226
Stone, clay, glass, and concrete products,	461	-8,655	-8,194	102	-6,061	-5,959
Primary metal products	564	-11,313	-10,749	3,500	-12,225	-8,725
Fabricated metl prod exc mach & transp equipment	1,097	-23,331	-22,234	2,878	-25,365	-22,487
Machinery, except electrical	5,567	-27,135	-21,567	3,406	-53,397	-49,991
Commercial and service industry	647	-1,646	-999	297	-8,820	-8,522
Computer equipment	2,526	-14,227	-11,702	-183	-29,417	-29,600

Table 3b, page 2

Industry	1997-2001 Growth in: Domestic exports	Consumption imports	Net export s	2001-2003 Growth in: Domestic exports	Consumption imports	Net exports
Engines, and turbines	37	-465	-427	-105	-709	-814
Industrial machinery	633	-683	-50	778	-1,161	-383
Electrical & electronic machines, equipment, and supplies	12,265	-84,292	-72,027	10,701	-101,332	-90,631
Audio and video equipment	414	-18,047	-17,633	189	-28,371	-28,182
Communications equipment	1,029	-6,313	-5,284	-651	-10,401	-11,051
Navigational instruments, optical media	2,840	-4,486	-1,646	3,221	-6,478	-3,258
Semiconductors	7,072	-27,855	-20,782	6,954	-32,391	-25,437
Transportation equipment	1,276	-7,959	-6,682	1,874	-8,254	-6,380
Motor vehicles and equipment	-269	-5,696	-5,965	1,583	-6,563	-4,980
Aerospace	1,512	-479	1,033	226	-383	-158
Medical equipment	512	-2,007	-1,495	250	-2,478	-2,228
Miscellaneous manufactured commodities	365	-35,940	-35,575	695	-37,619	-36,924
Transportation	1,567	-19,638	-18,071	4,259	-23,494	-19,236
Communications	781	-7,674	-6,893	1,151	-9,594	-8,442
Utilities	319	-2,947	-2,628	708	-3,798	-3,090
FIRE	1,342	-11,767	-10,425	3,007	-15,232	-12,225
Services, trade, and special industries	8,038	68,733	-60,695	12,441	87,593	-75,153
Government	174	-1,715	-1,541	405	-2,109	-1,704
Total	**45,933**	**-465,568**	**-419,635**	**87,357**	**-556,293**	**-468,936**
Ag, forestry and fisheries share of total	8.8%	1.5%	0.7%	33.9%	1.9%	-4.0%
Manufacturing share of total	63.7%	73.4%	74.5%	39.1%	71.7%	77.8%

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 5a:
Jobs created or displaced due to growing trade with China, sectoral details

		Growth in:		
		Domestic exports 1989 - 1997	Consumption imports 1989 - 1997	Net exports 1989 - 1997
1	Agricultural production	-964	-7,188	-8,152
2	Veterinary services	-6	-54	-60
3	Landscape and horticultural services	266	-1,546	-1,280
4	Agricultural services, n.e.c.	156	-1,716	-1,560
5	Forestry, fishing, hunting, and trapping	424	-896	-472
6	Metal mining	76	-482	-406
7	Coal mining	70	-447	-377
8	Crude petroleum, natural gas, and gas liquids	371	-95	276
9	Oil and gas field services	50	-11	40
10	Nonmetallic minerals, except fuels	292	-1,425	-1,132
11	Construction	442	-2,716	-2,274
12	Logging	-1,049	-1,036	-2,085
13	Sawmills and planing mills	189	-1,829	-1,640
14	Millwork, plywood, and structural members	141	-1,056	-916
15	Wood containers and misc. wood products	113	-3,736	-3,624
16	Wood buildings and mobile homes	27	-26	1
17	Household furniture	117	-8,453	-8,337
18	Partitions and fixtures	17	-439	-422
19	Office and misc furniture and fixtures	116	-6,753	-6,637
20	Glass and glass products	498	-2,771	-2,273
21	Hydraulic cement	6	-156	-150
22	Stone, clay, and misc mineral products	332	-6,355	-6,024
23	Concrete, gypsum, and plaster products	60	-1,749	-1,689
24	Blast furnaces and basic steel products	-398	-4,468	-4,866
25	Iron and steel foundries	420	-1,369	-949
26	Primary nonferrous smelting and refining	128	-741	-613
27	All other primary metals	166	-911	-745
28	Nonferrous rolling and drawing	1,221	-3,483	-2,262
29	Nonferrous foundries	376	-1,701	-1,326
30	Metal cans and shipping containers	25	-118	-93
31	Cutlery, handtools, and hardware	186	-3,928	-3,742
32	Plumbing and nonelectric heating equipment	106	-750	-644
33	Fabricated structural metal products	1,388	-1,769	-381
34	Screw machine products, bolts, rivets, etc.	320	-1,640	-1,320
35	Metal forgings and stampings	584	-2,310	-1,726
36	Metal coating, engraving, and allied services	633	-3,345	-2,712
37	Ordnance and ammunition	32	86	118
38	Miscellaneous fabricated metal products	701	-5,848	-5,148
39	Engines and turbines	655	-244	411
40	Farm and garden machinery	46	-289	-243
41	Construction and related machinery	1,454	-685	768
42	Metalworking machinery and equipment	891	-4,123	-3,232

Table 5a, page 2

		Growth in:		
		Domestic exports 1989 - 1997	**Consumption imports 1989 - 1997**	**Net exports 1989 - 1997**
43	Special industry machinery	894	-780	114
44	General industrial machinery and equipment	1,287	-4,719	-3,433
45	Computer and office equipment	710	-12,756	-12,046
46	Refrigeration and service industry machinery	1,133	-770	363
47	Industrial machinery nec	1,558	-4,006	-2,448
48	Electric distribution equipment	162	-1,187	-1,025
49	Electrical industrial apparatus	938	-3,660	-2,721
50	Household appliances	77	-5,632	-5,555
51	Electric lighting and wiring equipment	430	-10,290	-9,859
52	Household audio and video equipment	184	-18,757	-18,573
53	Communication equipment	1,986	-5,691	-3,705
54	Electronic components and accessories	5,581	-28,014	-22,433
55	Miscellaneous electrical equipment	428	-5,770	-5,343
56	Motor vehicles and equipment	1,113	-1,515	-402
57	Aerospace	8,415	-336	8,078
58	Ship and boat building and repairing	5	-29	-24
59	Railroad equipment	26	-91	-65
60	Miscellaneous transportation equipment	34	-2,188	-2,154
61	Search and navigation equipment	197	-308	-110
62	Measuring and controlling devices	1,113	-2,631	-1,519
63	Medical equipment, instruments, & supplies	549	-2,151	-1,602
64	Ophthalmic goods	47	-2,839	-2,792
65	Photographic equipment and supplies	129	-4,635	-4,506
66	Watches, clocks and parts	16	-4,004	-3,988
67	Jewelry, silverware, and plated ware	44	-2,169	-2,125
68	Toys and sporting goods	835	-54,610	-53,775
69	Manufactured products, nec	1,231	-24,096	-22,866
70	Meat products	1,002	-2,055	-1,053
71	Dairy products	47	-54	-7
72	Preserved fruits and vegetables	60	-497	-438
73	Grain mill products, fats and oils	828	-387	441
74	Bakery products	28	-163	-135
75	Sugar and confectionery products	65	-282	-217
76	Beverages	19	-60	-42
77	Miscellaneous foods and kindred products	67	-256	-189
78	Tobacco products	-30	-2	-32
79	Weaving, finishing, yarn and thread mills	201	-13,952	-13,751
80	Knitting mills	51	-8,338	-8,288
81	Carpets and rugs	41	-361	-321
82	Miscellaneous textile goods	84	-1,781	-1,697
83	Apparel	87	-47,655	-47,568
84	Miscellaneous fabricated textile products	116	-7,645	-7,530
85	Pulp, paper, and paperboard mills	717	-2,334	-1,617
86	Paperboard containers and boxes	429	-3,278	-2,848

Table 5a, page 3

		Growth in:		
		Domestic exports 1989 - 1997	**Consumption imports 1989 - 1997**	**Net exports 1989 - 1997**
87	Converted paper products except containers	186	-2,355	-2,169
88	Newspapers	277	-2,788	-2,511
89	Periodicals	76	-699	-623
90	Books	24	-972	-948
91	Miscellaneous publishing	52	-539	-488
92	Commercial printing and business forms	457	-3,624	-3,167
93	Greeting cards	8	-139	-131
94	Blankbooks and bookbinding	30	-2,506	-2,476
95	Service industries for the printing trade	34	-282	-248
96	Industrial chemicals	425	-4,332	-3,906
97	Plastics materials and synthetics	566	-4,022	-3,456
98	Drugs	162	-705	-543
99	Soap, cleaners, and toilet goods	146	-538	-393
100	Paints and allied products	92	-367	-275
101	Agricultural chemicals	1,342	-258	1,084
102	Miscellaneous chemical products	162	-1,129	-967
103	Petroleum refining	83	-362	-279
104	Miscellaneous petroleum and coal products	21	-167	-145
105	Tires and inner tubes	36	-1,012	-976
106	Rubber products, plastic hose and footwear	326	-21,428	-21,102
107	Miscellaneous plastics products, nec	1,377	-17,526	-16,149
108	Footwear except rubber and plastic	242	-49,949	-49,707
109	Luggage, handbags, and leather products, nec	186	-16,555	-16,370
110	Railroad transportation	245	-1,446	-1,200
111	Local and interurban passenger transit	86	-563	-477
112	Trucking and courier services, except air	1,683	-11,415	-9,731
113	Warehousing and storage	86	-637	-551
114	Water transportation	13	-70	-57
115	Air transportation	496	-3,107	-2,611
116	Pipelines, except natural gas	9	-47	-38
117	Passenger transportation arrangement	74	-464	-390
118	Miscellaneous transportation services	162	-1,054	-892
119	Telephone and telegraph comm. and comm. svc	300	-2,347	-2,047
120	Cable and pay television services	15	-156	-141
121	Radio and television broadcasting	188	-1,945	-1,757
122	Electric utilities	210	-1,495	-1,285
123	Gas utilities	100	-566	-465
124	Combined utilities	104	-646	-542
125	Water and sanitation	92	-792	-700
126	Wholesale trade	0	0	0
127	Retail trade, exc eating and drinking places	0	0	0
128	Eating and drinking places	617	-4,430	-3,814
129	Depository institutions	548	-3,731	-3,183
130	Nondepository; holding and investment offices	207	-1,580	-1,373

Table 5a, page 4

		Growth in: Domestic exports 1989 - 1997	Consumption imports 1989 - 1997	Net exports 1989 - 1997
131	Security and commodity brokers	121	-846	-726
132	Insurance carriers	162	-1,220	-1,057
133	Insurance agents, brokers, and service	93	-697	-604
134	Real estate	366	-3,208	-2,841
135	Royalties	0	0	0
136	Owner-occupied dwellings	0	0	0
137	Hotels and other lodging places	671	-4,634	-3,963
138	Other lodging places	1	-11	-10
139	Laundry, cleaning, and shoe repair	83	-811	-727
140	Personal services, nec	26	-218	-192
141	Beauty and barber shops	1	-5	-4
142	Funeral service and crematories	0	-1	-1
143	Advertising	0	0	0
144	Services to buildings	629	-3,902	-3,274
145	Miscellaneous equipment rental and leasing	214	-1,424	-1,210
146	Personnel supply services	2,138	-14,975	-12,836
147	Computer and data processing services	281	-1,778	-1,497
148	Miscellaneous business services	1,358	-13,033	-11,675
149	Automotive rentals, without drivers	91	-690	-599
150	Automobile parking, repair, and services	255	-1,289	-1,034
151	Electrical repair shops	95	-599	-504
152	Watch, jewelry, and furniture repair	1	-6	-5
153	Misc repair shops and related services	378	-2,382	-2,004
154	Motion pictures	126	-1,262	-1,136
155	Video tape rental	2	-14	-12
156	Producers, orchestras, and entertainers	68	-592	-524
157	Bowling centers	2	-11	-10
158	Commercial sports	40	-357	-317
159	Amusement and recreation services, nec	22	-153	-131
160	Offices of health practitioners	2	-15	-12
161	Nursing and personal care facilities	1	-8	-7
162	Hospitals	8	-58	-49
163	Health services, nec	2	-15	-13
164	Legal services	581	-3,333	-2,752
165	Educational Services	84	-476	-393
166	Individual and miscellaneous social services	1	-5	-4
167	Job training and related services	275	-5,447	-5,172
168	Child day care services	6	-39	-33
169	Residential care	1	-7	-6
170	Museums, botanical and zoological gardens	1	-5	-5
171	Membership organizations	110	-826	-717
172	Engineering and architectural services	308	-1,795	-1,487
173	Research and testing services	147	-1,086	-939
174	Management and public relations	468	-3,398	-2,929

Table 5a, page 5

		Growth in: Domestic exports 1989 - 1997	Consumption imports 1989 - 1997	Net exports 1989 - 1997
175	Accounting, auditing, and other services	479	-3,710	-3,232
176	Private households	0	0	0
177	US Postal Service	276	-2,483	-2,207
178	Federal electric utilities	12	-89	-77
179	Federal government enterprises, nec	16	-120	-104
180	Federal general government	0	0	0
181	Federal government capital services	0	0	0
182	Local government passenger transit	34	-222	-188
183	State and local electric utilities	48	-349	-301
184	State and local government enterprises, nec	192	-1,657	-1,464
185	State and local government hospitals	0	0	0
186	State and local government education	0	0	0
187	State and local general government, nec	0	0	0
188	State and local government capital services	0	0	0
189	Noncomparable imports	0	0	0
190	Scrap, used and secondhand goods	0	0	0
191	Rest of the world industry	0	0	0
192	Inventory valuation adjustment	0	0	0
	U.S.-China total	**65,432**	**-629,318**	**-563,886**

NOTE: RETAIL, WHOLESALE AND ADVERTISING SERVICES ZEROED OUT.

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 5b:
Jobs created or displaced due to growing trade with China, sectoral detail

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
1 Agricultural products	3,220	27,354	-2,883	-4,989	336	22,365
2 Forestry, fishing, hunting, and trapping	207	588	-1,838	-2,881	-1,631	-2,293
3 Logging	408	410	-1,318	-1,608	-910	-1,198
4 Support activities for agriculture and forestry	222	1,257	-766	-1,187	-544	70
5 Oil and gas extraction	-178	211	-329	-344	-507	-133
6 Coal mining	12	119	-340	-371	-328	-252
7 Metal ore mining	84	375	-514	-425	-430	-50
8 Nonmetallic mineral mining and quarrying	200	293	-701	-477	-501	-185
9 Support activities for mining	-10	35	-70	-72	-80	-37
10 Electric power generation, transmission, and distribution	126	330	-1,211	-1,449	-1,086	-1,119
11 Natural gas distribution	30	101	-373	-441	-343	-340
12 Water, sewage, and other systems	4	18	-31	-38	-27	-20
13 Waste management and remediation services	159	259	-1,332	-1,870	-1,173	-1,611
14 Construction	272	584	-2,552	-3,179	-2,280	-2,595
15 Animal food manufacturing	75	381	-94	-127	-19	254
16 Grain and oilseed milling	-282	308	-82	-156	-364	152
17 Sugar and confectionery product manufacturing	36	11	87	-156	124	-145
18 Fruit and vegetable preserving and specialty food manufacturing	139	122	-155	-881	-15	-759
19 Dairy product manufacturing	68	9	-42	-57	26	-49
20 Animal slaughtering and processing	1,608	820	-812	-876	796	-56
21 Seafood product preparation and packaging	84	-2	-553	-305	-469	-307
22 Bakeries and tortilla manufacturing	8	68	-165	-204	-157	-136
23 Other food manufacturing	135	193	-130	-131	6	62
24 Beverage manufacturing	7	17	-50	-62	-44	-45
25 Tobacco manufacturing	-2	1	-10	2	-12	3
26 Fiber, yarn, and thread mills	169	168	-1,472	-2,692	-1,303	-2,524
27 Fabric mills	278	591	-3,325	-7,564	-3,047	-6,973
28 Textile and fabric finishing and fabric coating mills	110	304	-2,366	-3,956	-2,256	-3,652
29 Textile furnishings mills	-4	10	-2,201	-6,034	-2,205	-6,024
30 Other textile product mills	50	148	-3,516	-4,218	-3,466	-4,070
31 Apparel knitting mills	7	5	-890	-2,591	-882	-2,587
32 Cut and sew apparel manufacturing	22	30	-8,800	-17,364	-8,778	-17,334
33 Apparel accessories and other apparel manufacturing	152	-146	-2,783	-4,162	-2,631	-4,308
34 Leather and hide tanning and finishing	60	128	-1,173	-896	-1,113	-768
35 Footwear manufacturing	-8	-13	-27,450	-3,913	-27,458	-3,927
36 Other leather and allied product manufacturing	277	-73	-2,663	-9,459	-2,385	-9,532
37 Sawmills and wood preservation	368	340	-1,615	-1,537	-1,247	-1,197
38 Veneer, plywood, and engineered wood product manufacturing	92	144	-1,597	-1,991	-1,505	-1,847
39 Other wood product manufacturing	121	333	-5,291	-3,564	-5,169	-3,231

Table 5b, page 2

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
39 Other wood product manufacturing	121	333	-5,291	-3,564	-5,169	-3,231
40 Pulp, paper, and paperboard mills	368	407	-1,584	-2,023	-1,217	-1,616
41 Converted paper product manufacturing	358	561	-5,387	-5,924	-5,029	-5,363
42 Printing and related support activities	390	613	-6,347	-6,986	-5,957	-6,374
43 Petroleum and coal products manufacturing	44	189	-367	-387	-323	-198
44 Basic chemical manufacturing	606	1,596	-2,062	-2,344	-1,456	-748
45 Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	860	771	-2,130	-2,535	-1,270	-1,764
46 Pesticide, fertilizer, and other agricultural chemical manufacturing	-1,219	305	-142	-272	-1,362	33
47 Pharmaceutical and medicine manufacturing	148	229	-199	-372	-51	-143
48 Paint, coating, and adhesive manufacturing	103	107	-588	-660	-486	-553
49 Soap, cleaning compound, and toilet preparation manufacturing	50	205	-472	-439	-422	-234
50 Other chemical product and preparation manufacturing	526	531	-1,021	-1,365	-495	-835
51 Plastics product manufacturing	1,086	1,023	-11,861	-12,783	-10,775	-11,760
52 Rubber product manufacturing	186	219	-2,986	-3,556	-2,800	-3,337
53 Clay product and refractory manufacturing	307	-7	-1,785	-2,531	-1,477	-2,537
54 Glass and glass product manufacturing	-49	8	-3,579	-2,254	-3,629	-2,245
55 Cement and concrete product manufacturing	37	51	-2,167	-20	-2,130	31
56 Lime and gypsum product manufacturing	7	27	-73	-64	-66	-37
57 Other nonmetallic mineral product manufacturing	159	22	-1,051	-1,192	-892	-1,170
58 Iron and steel mills and ferroalloy manufacturing	135	1,197	-1,996	-2,133	-1,861	-936
59 Steel product manufacturing from purchased steel	51	470	-978	-1,111	-928	-640
60 Alumina and aluminum production and processing	-212	66	-1,126	-1,361	-1,339	-1,295
61 Nonferrous metal (except aluminum) production and processing	213	1,107	-1,966	-1,683	-1,753	-576
62 Foundries	135	394	-2,771	-2,980	-2,636	-2,586
63 Forging and stamping	243	265	-2,476	-2,958	-2,233	-2,693
64 Cutlery and handtool manufacturing	252	0	-2,690	-3,174	-2,438	-3,174
65 Architectural and structural metals manufacturing	105	189	-2,672	-3,156	-2,566	-2,966
66 Boiler, tank, and shipping container manufacturing	-506	429	-716	-636	-1,223	-207
67 Hardware manufacturing	17	45	-1,421	-1,377	-1,405	-1,332
68 Spring and wire product manufacturing	69	233	-1,556	-1,889	-1,488	-1,656
69 Machine shops; turned product; and screw, nut, and bolt manufacturing	475	715	-4,759	-5,656	-4,284	-4,940
70 Coating, engraving, heat treating, and allied activities	251	308	-2,002	-2,590	-1,751	-2,282
71 Other fabricated metal product manufacturing	434	958	-7,515	-6,888	-7,080	-5,930

Table 5b, page 3

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
72 Agriculture, construction, and mining machinery manufacturing	-280	720	-524	-1,162	-804	-442
73 Industrial machinery manufacturing	633	778	-683	-1,161	-50	-383
74 Commercial and service industry machinery manufacturing	647	297	-1,646	-8,820	-999	-8,522
75 Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	748	461	-3,217	-4,874	-2,469	-4,413
76 Metalworking machinery manufacturing	600	371	-1,556	-1,552	-957	-1,181
77 Engine, turbine, and power transmission equipment manufacturing	37	-105	-465	-709	-427	-814
78 Other general purpose machinery manufacturing	657	1,067	-4,816	-5,702	-4,160	-4,636
79 Computer and peripheral equipment manufacturing	2,526	-183	-14,227	-29,417	-11,702	-29,600
80 Communications equipment manufacturing	1,029	-651	-6,313	-10,401	-5,284	-11,051
81 Audio and video equipment manufacturing	414	189	-18,047	-28,371	-17,633	-28,182
82 Semiconductor and other electronic component manufacturing	7,072	6,954	-27,855	-32,391	-20,782	-25,437
83 Navigational, measuring, electromedical, and control instruments manufacturing	2,275	3,256	-4,209	-4,695	-1,934	-1,438
84 Manufacturing and reproducing magnetic and optical media	565	-36	-277	-1,783	288	-1,819
85 Electric lighting equipment manufacturing	132	90	-9,561	-5,997	-9,430	-5,907
86 Household appliance manufacturing	92	65	-10,734	-7,791	-10,642	-7,727
87 Electrical equipment manufacturing	-50	548	-2,977	-4,632	-3,027	-4,085
88 Other electrical equipment and component manufacturing	737	286	-4,319	-5,269	-3,582	-4,984
89 Motor vehicle manufacturing	-78	156	-58	-66	-137	90
90 Motor vehicle body and trailer manufacturing	25	62	-438	-288	-413	-226
91 Motor vehicle parts manufacturing	-216	1,365	-5,200	-6,209	-5,416	-4,844
92 Aerospace product and parts manufacturing	1,512	226	-479	-383	1,033	-158
93 Railroad rolling stock manufacturing	38	1	-62	-86	-24	-86
94 Ship and boat building	2	56	-358	129	-356	186
95 Other transportation equipment manufacturing	-6	7	-1,365	-1,350	-1,371	-1,343
96 Household and institutional furniture and kitchen cabinet manufacturing	54	78	-34,673	-33,995	-34,619	-33,917
97 Office furniture (including fixtures) manufacturing	29	20	-3,178	-4,435	-3,149	-4,415
98 Other furniture related product manufacturing	9	9	-1,008	-1,237	-999	-1,229
99 Medical equipment and supplies manufacturing	512	250	-2,007	-2,478	-1,495	-2,228
100 Other miscellaneous manufacturing	365	695	-35,940	-37,619	-35,575	-36,924
101 Wholesale trade	0	0	0	0	0	0
102 Retail trade	0	0	0	0	0	0
103 Air transportation	143	183	-1,191	-1,569	-1,048	-1,386
104 Rail transportation	47	323	-871	-985	-824	-662
105 Water transportation	7	28	-114	-124	-107	-96

Table 5b, page 4

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
106 Truck transportation and couriers and messengers	618	2,153	-10,390	-11,999	-9,773	-9,846
107 Transit and ground passenger transportation	48	74	-408	-525	-361	-451
108 Pipeline transportation	-1	51	-137	-160	-139	-109
109 Scenic and sightseeing transportation and support activities for transportation	124	314	-1,485	-1,824	-1,361	-1,510
110 Postal Service	197	330	-2,075	-2,544	-1,878	-2,214
111 Warehousing and Storage	385	803	-2,966	-3,764	-2,581	-2,961
112 Newspaper, periodical, book, and directory publishers	183	297	-2,055	-2,470	-1,872	-2,172
113 Software publishers	37	5	-233	-423	-195	-418
114 Internet services, data processing, and other information services	196	269	-1,700	-2,162	-1,504	-1,893
115 Motion picture and sound recording Industries	51	85	-600	-714	-549	-629
116 Radio and television broadcasting	88	144	-1,027	-1,222	-938	-1,078
117 Cable and other subscription programming and program distribution	13	22	-140	-168	-128	-147
118 Telecommunications, except cable and other programming distribution	213	329	-1,919	-2,435	-1,706	-2,106
119 Monetary authorities and depository credit intermediation	290	531	-2,544	-3,256	-2,254	-2,725
120 Nondepository credit intermediation and related support activities, funds, trusts, and lessors of nonfinancial institutions	240	427	-2,379	-3,333	-2,139	-2,907
121 Securities, commodity contracts, and other financial investments and related activities	160	258	-1,494	-1,972	-1,334	-1,715
122 Insurance carriers	122	386	-984	-1,207	-862	-821
123 Agencies, brokerages, and other insurance related activities	61	186	-494	-612	-434	-426
124 Real estate	313	947	-2,353	-3,025	-2,040	-2,078
125 Automotive equipment rental and leasing	52	90	-500	-604	-448	-514
126 Consumer goods rental and general rental centers	69	105	-665	-798	-595	-693
127 Commercial and industrial machinery and equipment rental and leasing	36	78	-355	-426	-319	-348
128 Legal services	404	587	-3,062	-3,955	-2,659	-3,368
129 Accounting, tax preparation, bookkeeping, and payroll services	343	572	-3,098	-3,846	-2,755	-3,274
130 Architectural, engineering, and related services	480	741	-3,324	-4,151	-2,843	-3,410
131 Specialized design services	81	136	-1,344	-1,406	-1,263	-1,270
132 Computer systems design and related services	139	181	-1,065	-1,397	-926	-1,216
133 Management, scientific, and technical consulting services	249	459	-2,323	-2,912	-2,074	-2,453
134 Scientific research and development and other professional, scientific, and technical svcs.	742	1,075	-5,940	-7,499	-5,198	-6,424
135 Advertising and related services	0	0	0	0	0	0

Table 5b, page 5

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
136 Management of companies and enterprises	1,621	2,203	-13,889	-17,400	-12,267	-15,197
137 Office administrative and facilities support services	66	114	-576	-745	-510	-631
138 Employment services	792	1,300	-7,144	-9,219	-6,352	-7,919
139 Business support and investigation and security services and support services, nec	941	1,035	-7,064	-10,005	-6,124	-8,970
140 Travel arrangement and reservation services	63	100	-585	-748	-522	-648
141 Services to buildings and dwellings	403	759	-3,586	-4,579	-3,183	-3,820
142 Educational services	80	121	-583	-767	-503	-646
143 Offices of health practitioners	1	3	-15	-18	-14	-15
144 Ambulatory health care services except offices of health practitioners	8	16	-82	-99	-74	-84
145 Hospitals	3	4	-23	-30	-20	-26
146 Nursing care and residential mental health facilities	1	1	-7	-8	-6	-7
147 Community care facilities for the elderly and residential care facilities, nec	0	0	-2	-3	-2	-2
148 Individual, family, community, and vocational rehabilitation services	0	1	-5	-6	-4	-5
149 Child day care services	0	0	0	0	0	0
150 Performing arts companies, promoters, agents, managers and independent artists	76	122	-715	-888	-640	-766
151 Spectator sports	24	43	-261	-317	-237	-274
152 Museums, historical sites, and similar institutions	0	1	-3	-4	-3	-3
153 Amusement, gambling, and recreation industries	123	235	-1,041	-1,344	-918	-1,109
154 Traveler accommodation	381	594	-3,412	-4,366	-3,031	-3,772
155 RV parks, recreational camps, and rooming and boarding houses	1	4	-12	-15	-11	-11
156 Food services and drinking places	374	558	-3,510	-4,420	-3,136	-3,862
157 Automotive repair and maintenance	117	379	-1,413	-1,676	-1,297	-1,297
158 Electronic and precision equipment repair and maintenance	62	118	-576	-693	-515	-576
159 Commercial and industrial equipment (except automotive and electronic) repair and maintenance	207	525	-1,850	-2,203	-1,643	-1,678
160 Personal and household goods repair and maintenance	35	71	-343	-409	-308	-338
161 Personal care services	0	0	-2	-2	-2	-2
162 Death care services	0	0	0	0	0	0
163 Drycleaning and laundry services	66	72	-529	-741	-463	-669
164 Other Personal Services	17	24	-140	-183	-123	-159
165 Religious, grantmaking and giving services, and social advocacy organizations	1	1	-5	-6	-4	-5
166 Civic, social, business, and similar organizations	138	285	-1,203	-1,532	-1,065	-1,247
167 Private households	0	0	0	0	0	0
168 Federal electric utilities	7	17	-63	-75	-56	-58

Table 5b, page 6

	Growth in:					
	Domestic exports		Consumption imports		Net exports	
	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003	1997 - 2001	2001 - 2003
169 Federal government enterprises, nec	13	27	-125	-166	-112	-139
170 Federal general government	5	6	-37	-49	-32	-42
171 Federal government capital services	0	0	0	0	0	0
172 Local government passenger transit	24	38	-209	-269	-184	-231
173 State and local electric utilities	26	67	-244	-293	-219	-226
174 State and local government enterprises	83	224	-905	-1,086	-822	-862
175 State and local government hospitals	1	2	-8	-11	-7	-9
176 State and local government education	9	14	-72	-93	-63	-79
177 State and local general government, nec	6	10	-53	-68	-46	-58
178 State and local government capital services	0	0	0	0	0	0
179 Royalties	0	0	0	0	0	0
180 Owner-occupied dwellings	0	0	0	0	0	0
181 Noncomparable imports	0	0	0	0	0	0
182 Scrap, used and secondhand goods	0	0	0	0	0	0
183 Rest of the world industry	0	0	0	0	0	0
184 Inventory valuation adjustment	0	0	0	0	0	0
U.S.-China total	**45,933**	**87,357**	**-465,568**	**-556,293**	**-419,635**	**-468,936**

NOTE: RETAIL, WHOLESALE AND ADVERTISING SERVICES ZEROED OUT.

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 6a:
Jobs created and displaced by state as a result of trade with China, 1989-1997

	Changes due to growth in:		
	Exports	**Imports**	**Net exports**
	Jobs gained	***Jobs destroyed***	***Jobs gained or lost***
Alaska	102	-436	-334
Alabama	903	-10,236	-9,334
Arkansas	658	-9,321	-8,663
Arizona	1,252	-8,527	-7,275
California	8,796	-90,565	-81,769
Colorado	992	-8,358	-7,366
Connecticut	1,261	-8,046	-6,786
District of Columbia	56	-413	-357
Delaware	160	-1,203	-1,043
Florida	2,634	-25,558	-22,924
Georgia	1,802	-17,257	-15,455
Hawaii	98	-1,250	-1,152
Iowa	727	-5,690	-4,964
Idaho	335	-2,638	-2,303
Illinois	3,512	-29,250	-25,738
Indiana	1,848	-18,297	-16,449
Kansas	952	-3,654	-2,702
Kentucky	832	-8,754	-7,922
Louisiana	612	-4,152	-3,539
Massachusetts	1,705	-20,359	-18,655
Maryland	884	-6,655	-5,771
Maine	243	-8,742	-8,499
Michigan	2,648	-22,402	-19,755
Minnesota	1,372	-16,542	-15,170
Missouri	1,415	-11,450	-10,035
Mississippi	532	-5,410	-4,877
Montana	102	-1,232	-1,130
North Carolina	1,816	-26,221	-24,405
North Dakota	76	-951	-875
Nebraska	337	-3,725	-3,388
New Hampshire	455	-3,699	-3,243
New Jersey	1,576	-17,078	-15,502
New Mexico	281	-2,150	-1,869
Nevada	300	-2,632	-2,332
New York	3,023	-38,265	-35,242
Ohio	3,079	-24,300	-21,221
Oklahoma	711	-6,128	-5,417
Oregon	742	-7,393	-6,651
Pennsylvania	2,946	-29,654	-26,709
Rhode Island	262	-2,841	-2,579
South Carolina	917	-10,509	-9,592
South Dakota	123	-1,413	-1,290
Tennessee	1,223	-14,655	-13,431
Texas	4,962	-41,642	-36,680
Utah	529	-5,992	-5,463
Vermont	188	-1,846	-1,658

Table 6a, page 2

	Changes due to growth in:		
	Exports	**Imports**	**Net exports**
	Jobs gained	***Jobs destroyed***	***Jobs gained or lost***
Virginia	1,340	-12,032	-10,693
Washington	1,808	-8,545	-6,738
Wisconsin	1,918	-18,005	-16,088
West Virginia	321	-2,706	-2,385
Wyoming	71	-542	-471
Total	**65,432**	**-629,318**	**-563,886**

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Table 6b:
Jobs created and displaced by state as a result of trade with China, 1997-2003

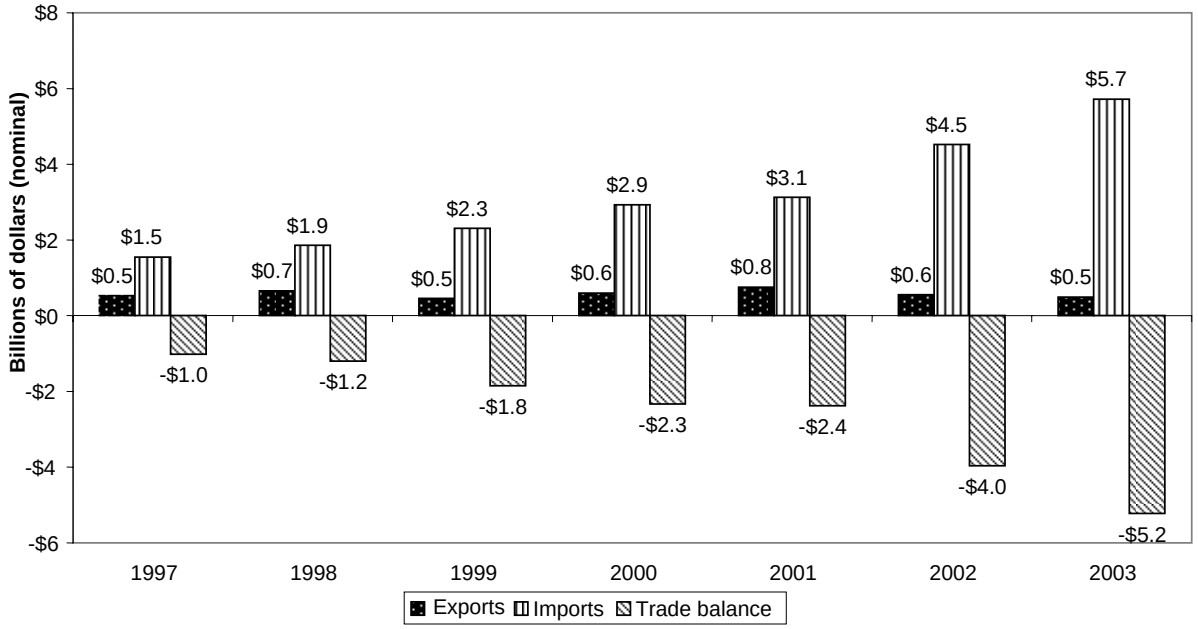
	1997-2001 Changes due to growth in:			2001-2003 Changes due to growth in:		
	Exports	Imports	Net Exports	Exports	Imports	Net Exports
	Jobs gained	*Jobs destroyed*	*Jobs gained or lost*	*Jobs gained*	*Jobs destroyed*	*Jobs gained or lost*
Alabama	643	-7040	-6398	1385	-8651	-7265
Alaska	51	-668	-618	155	-872	-717
Arizona	1187	-8158	-6971	1729	-10149	-8420
Arkansas	475	-6750	-6275	1002	-5187	-4185
California	7086	-60572	-53486	11574	-76242	-64667
Colorado	805	-6572	-5767	1074	-8080	-7006
Connecticut	672	-5125	-4453	936	-6320	-5384
Delaware	141	-982	-841	291	-1149	-858
District of Columbia	49	-432	-382	75	-552	-477
Florida	1881	-19440	-17559	3436	-22979	-19544
Georgia	1143	-15405	-14262	1971	-19102	-17131
Hawaii	96	-950	-854	327	-1214	-887
Idaho	284	-2020	-1736	783	-2682	-1899
Illinois	1877	-22403	-20526	3574	-26978	-23404
Indiana	988	-14159	-13172	2304	-16217	-13913
Iowa	607	-5383	-4777	1765	-6370	-4605
Kansas	458	-3210	-2752	1073	-4025	-2952
Kentucky	555	-6087	-5532	1469	-7140	-5671
Louisiana	321	-3539	-3218	936	-4353	-3418
Maine	197	-4379	-4182	371	-2641	-2271
Maryland	576	-5064	-4488	910	-6724	-5814
Massachusetts	1446	-14164	-12718	1578	-16669	-15091
Michigan	1197	-17071	-15874	3019	-18382	-15363
Minnesota	1147	-11739	-10591	2637	-12856	-10219
Mississippi	459	-4742	-4284	834	-5452	-4618
Missouri	582	-8334	-7752	1799	-9195	-7396
Montana	129	-918	-788	526	-1118	-592
Nebraska	287	-2334	-2048	1295	-2873	-1578
Nevada	214	-2217	-2003	423	-2629	-2206
New Hampshire	391	-3292	-2901	469	-3768	-3298
New Jersey	1212	-11668	-10456	1708	-14770	-13062
New Mexico	198	-1853	-1656	533	-2219	-1686
New York	2107	-22221	-20114	3341	-29707	-26365
North Carolina	1439	-18663	-17224	2735	-23804	-21070
North Dakota	98	-736	-638	475	-859	-383
Ohio	1711	-19531	-17820	3249	-22302	-19053
Oklahoma	493	-4937	-4444	1422	-5525	-4103
Oregon	868	-6335	-5467	1627	-7946	-6319
Pennsylvania	2037	-22790	-20753	3466	-25827	-22361
Rhode Island	194	-2466	-2272	276	-2973	-2697
South Carolina	623	-7167	-6543	1244	-9458	-8214
South Dakota	154	-1200	-1046	569	-1466	-896
Tennessee	831	-11728	-10897	1620	-12687	-11067
Texas	4068	-33024	-28957	7747	-41531	-33784
Utah	400	-3758	-3358	705	-4649	-3944
Vermont	154	-1386	-1231	241	-1563	-1322
Virginia	1071	-10531	-9460	1691	-13136	-11445

Table 6b, page 2

	1997-2001 Changes due to growth in:			2001-2003 Changes due to growth in:		
	Exports	**Imports**	**Net Exports**	**Exports**	**Imports**	**Net Exports**
	Jobs gained	***Jobs destroyed***	***Jobs gained or lost***	***Jobs gained***	***Jobs destroyed***	***Jobs gained or lost***
Washington	976	-6346	-5370	1883	-8260	-6377
West Virginia	219	-2187	-1969	493	-2744	-2252
Wisconsin	1070	-13345	-12275	2339	-13645	-11306
Wyoming	66	-539	-473	275	-648	-372
Total	**45932**	**-465560**	**-419627**	**87355**	**-556283**	**-468927**

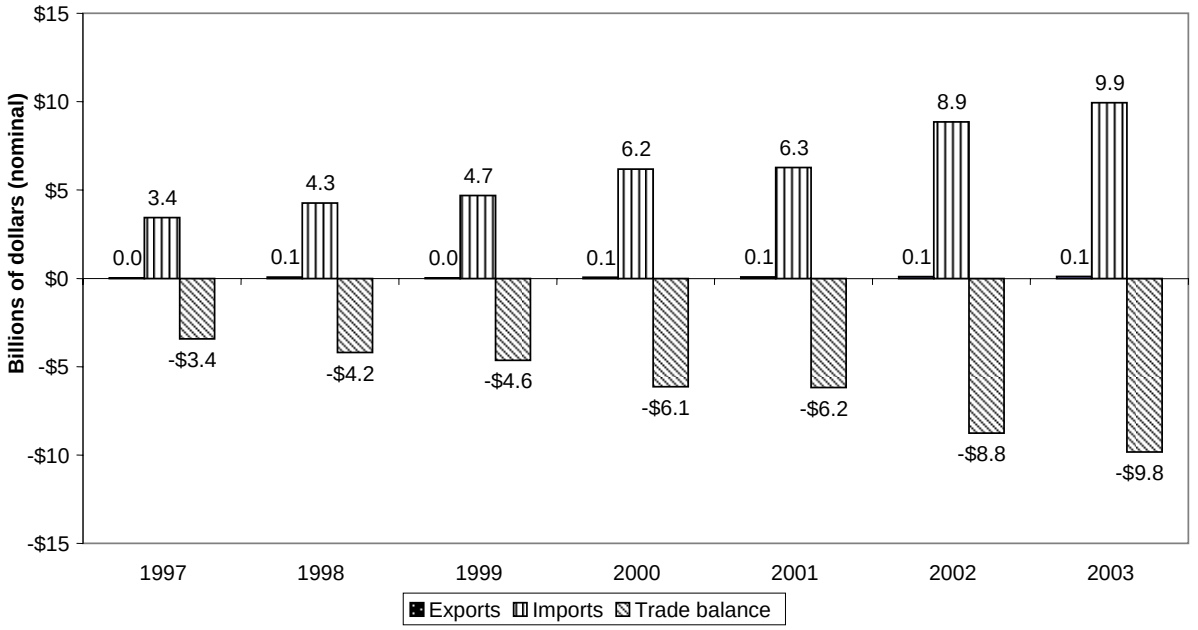
Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data.

Figure 6:
Communications equipment trade with China, 1997 - 2003



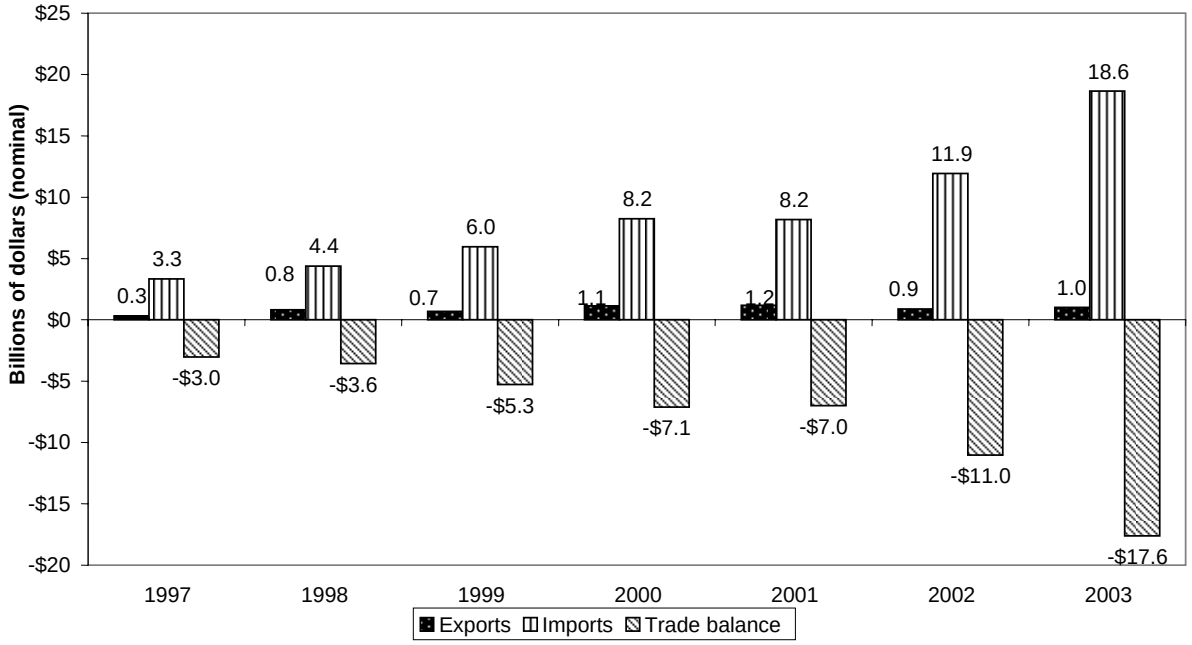
Source: USITC (2004)

Figure 7:
Audio and video equipment trade with China, 1997 - 2003



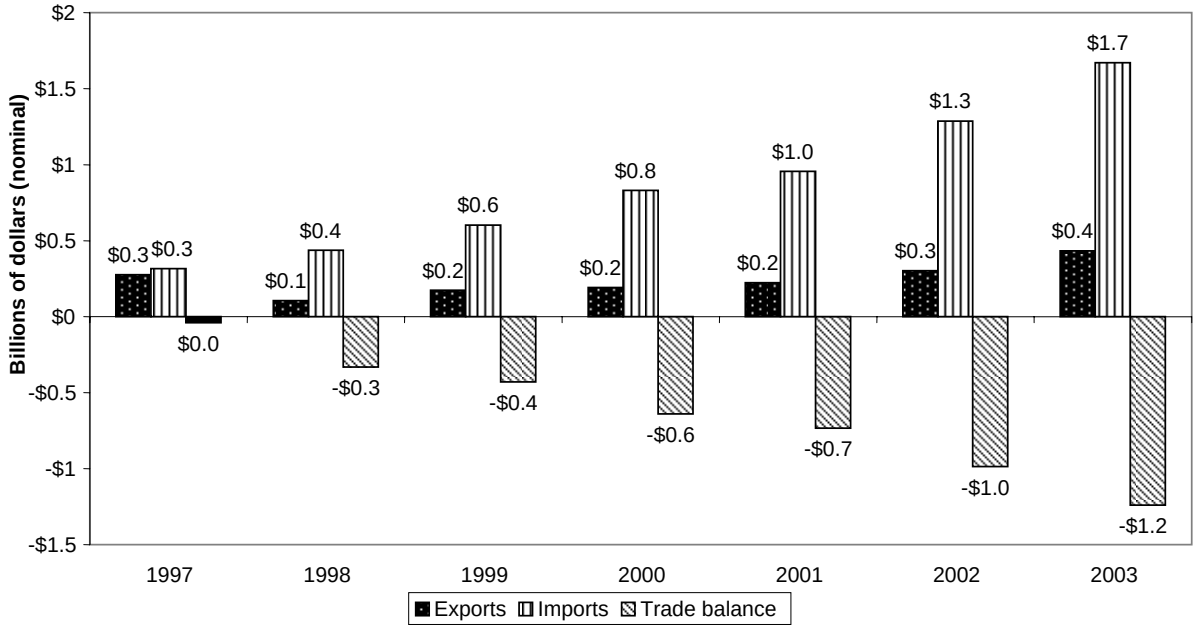
Source: USITC (2004).

Figure 8:
Computer equipment trade with China, 1997 - 2003



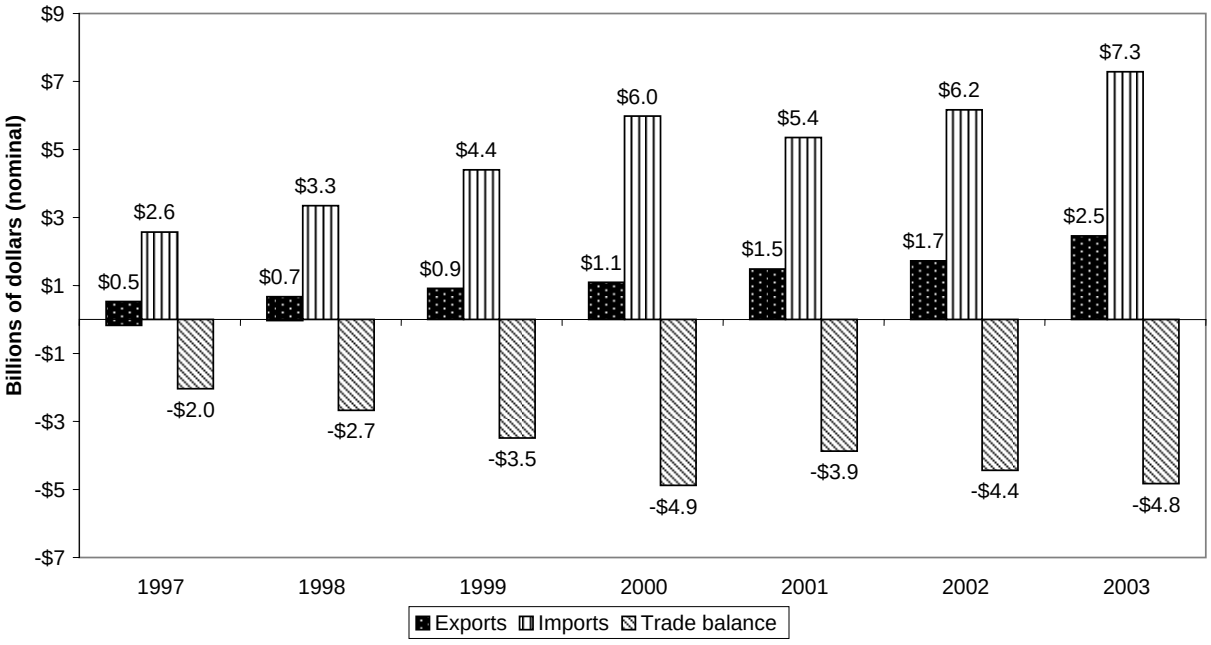
Source: USITC (2004).

Figure 9:
Motor vehicle parts trade with China, 1997 - 2003



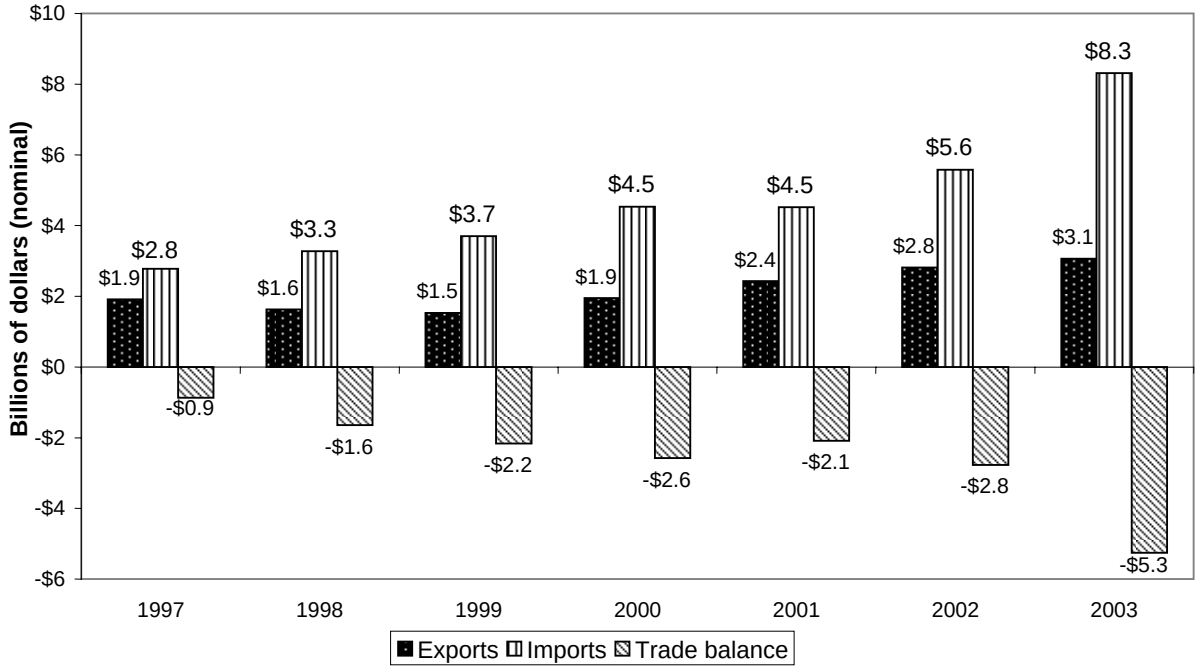
Source: USITC (2004).

Figure 10:
Semiconductor trade with China, 1997 - 2003



Source: USITC (2004).

Figure 11:
Non-electrical machinery trade with China, 1997 - 2003



Source: USITC (2004).

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Endnotes

[1] The term "job opportunities" refers to actual or potential domestic jobs that could be supported by the amount of production represented by a given volume of imports or exports.

[2] The model used in this study breaks the economy down into either 184 or 192 discrete sectors or "industries." It is assumed that equal amounts of labor are required to produce one dollar's worth of imports or exports in that sector. Thus the employment effects of a $10 trade surplus in agricultural products (industry 1) are the same whether they represents imports of $0 and exports of $10, or imports of $90 and exports of $100.

[3] We distinguish carefully between total exports and domestic exports, and between consumption imports and general imports in this analysis. Domestic exports are goods produced in the U.S. Total exports also include goods produced in other countries and shipped through the U.S. Only goods produced in the domestic economy support employment in this country. Analogously, consumption imports are goods consumed in this country, while general imports also include some goods that are transshipped elsewhere. While there consumption imports were only 0.5% less than general imports in 2003, domestic exports were 6% less than total exports in that year. Hence, this later distinction has a significant effect on the trade balance and employment effects of U.S. exports. Foreign exports (the difference between total and domestic exports) were only 0.6% of total exports in 1989, so the value of goods transshipped through the U.S. has been growing over time, relative to total trade.

[4] Note that the some sectors that used to be included within manufacturing are now treated as part of the services sector, for example, software programming. Some trade in these industries is included in our data set. Therefore, a small share of services jobs reported represent direct employment effects. See table 3b.

[5] The Standard Industrial Classification system was developed and used by the U.S. Census Bureau to categorize different sectors of the economy. The definition of these sectors was derived from the Census of Manufactures (the most recent SIC code definitions were based on the 1987 Census).

[6] North American Industry Classification System (NAICS pronounced "Nakes") was developed jointly by the U.S., Canada, and Mexico to provide new comparability in statistics about business activity across North America. It was

first used in the release of Census data for 1999. The most recent revisions, based on the 2002 Census of Manufactures, were utilized in this report.

[7] The data in this report are broken into two separate periods because of changes in the way data are collected and aggregated by U.S. statistical agencies during the study period. Between 1989 and 1997, data on trade, employment and the economy were reported using the Standard Industrial Classification system (SIC). Beginning in 1997, the Commerce Department and Census Bureau began to convert all their data collection and analysis efforts to the North American Industry Classification System (NAICS). As a result, two tables are presented for each type of industry-specific analysis presented here for 1989 to 1997 and 1997 to 2003. During the earlier period, we examine up to 192 SIC-based industries, and in the latter period there are 184 NAICS-based sectors.

[8] In fact, China's real GDP increased by a factor of 2.72 between 1989 and 2000 for an annual growth rate of nearly 9.5% (IFS 2004). Per capita income increased at slightly less torpid factor of 2.43 in the same period (annual growth of 8.5%). According to Wu and Perloff (2004), since the early 1980s China's per capita income has quadrupled.

[9] Estimates for job losses in textiles and apparel substantially underestimate the actual impacts of trade in these industries. This analysis assumes that the labor content of the volume of goods that can be imported per thousand dollars is identical to labor content of producing this bundle of goods in the U.S. However, imported garments are substantially cheaper than those in the U.S., so $1,000 worth of imports can displace domestic products with a much greater value. Thus, our input-output method underestimates the amount of labor required to produce an equivalent volume of goods. This is a general problem with labor content studies of this type, and it the distortions are proportionately larger in sectors such as apparel where domestic and imported unit values differ greatly.

[10] Other studies—see California State World Trade Commission (1996), which finds 47,600 jobs created in California from increased trade with Canada alone—have allocated all employment effects to the home state of the exporting company. This is problematic, because the production—along with any attendant job effects—need not have taken place in the exporter's state. If a California dealer buys cars from Chrysler and sells them to China, these studies will find job creation in California. However, the cars are not made in California; so the employment effects should instead be attributed to Michigan and other state with high levels of aut- industry production. Likewise, if the same firm buys auto parts from China, the loss of employment will occur in auto-industry states, not in California.

[11] We assume that labor content in the production of computer equipment is more closely related to nominal prices than real prices. Therefore, we keep the price deflator for the computer industry constant over the period.

[12] Industry-specific producer price indices are unavailable for certain industries between 2002-2003. In order to construct price deflators for all 184 BLS industries, we used a combination of commodity PPIs and industry PPIs. For instance, NAICS-based industry 3,331 (which maps to BLS industry 72) is composed of agricultural, manufacturing, and mining machinery manufacturing. To compute a price index for this industry, a trade-weighted average of the commodity indices for agricultural machinery and construction machinery was used as a proxy for the industry PPI. Industry PPIs were used wherever available.

[13] Job effect estimates of retail trade, wholesale trade, and advertising were set to zero for both NAICS and SIC industry-based analyses. We assume that goods must be sold and advertised whether they are produced in the U.S. or imported for consumption.