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Briefing Paper

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AMERICAN JOBS AND THE ASIAN CRISIS

The Employment Impact of the Coming Rise in the U.S. Trade Deficit

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The recent collapse of Asian currencies and financial markets will have severe economic consequences for the United States. A slowdown or shrinkage in domestic demand in the Asian nations affected by the crisis will force them to export their way out of their problems, and the impact will spread throughout the global economy. As a result, the U.S. merchandise trade deficit could increase from an estimated $200 billion in 1997 to $300 billion to $400 billion within the next 12 to 24 months.[1] This study analyzes the employment impacts of both a $100 billion and a $200 billion increase in the U.S. trade deficit, thus providing a range of estimates of the impact of the Asian crises on the U.S. labor market.

This study finds that, if the U.S. trade deficit increases by $100 billion to $200 billion, 700,000 to 1.5 million jobs will be eliminated in manufacturing and other tradable goods industries, and these job losses will occur in every state. Male blue-collar workers will be particularly hard hit. If these losses are not immediately offset with substantially lower interest rates from the Federal Reserve, unemployment will rise and gross domestic product will fall by 1.3% to 2.6%.

But even if the Fed could lower interest rates fast enough and far enough to prevent the national unemployment rate from rising at all — an extremely difficult task — an increase in the trade deficit of this magnitude would mean a rapid shift of 600,000 to 1.1 million jobs out of manufacturing and tradable goods industries into the lower-paying service sector. Substantial dislocation of families and disruptions in the nation's communities would be unavoidable. Moreover, since service-sector jobs pay less than those in manufacturing, average wages will be reduced, thereby threatening a premature end to the recent upturn in wages at the bottom of the income distribution.[2]

Furthermore, even successful compensating action by the Fed would be unable to prevent a drop in GDP of 0.5% to 1.0% over the next two years, as the low-wage, low productivity non-traded goods sector expands to replace the high-wage jobs destroyed by rising trade deficits. Specifically, up to 119,000 high- and medium-wage jobs will be replaced by up to 119,000 low-wage jobs (in the bottom fifth); these replacement jobs will generate only $63 billion in GDP to offset a $100 billion increase in the trade deficit. Thus, average incomes will decline by at least 0.5% to 1.0% as trade deficits grow. Losses will be significantly larger if the Fed is unsuccessful at offsetting the effects of the Asian crisis.

The job dislocation effects of the increased trade deficit presented here are conservative, since they leave out several effects that will act to make the problem worse. First, we refer only to the direct and indirect effects of trade on employment, and do not include any of the potentially large and significant "multiplier effects" found in most macroeconomic models.The job effects estimated here include, for example, the impact on jobs in plants producing automobiles (direct effects) and in plants producing materials used to make automobiles (indirect effects), but not the effect of a drop in the sales of items that newly unemployed workers might otherwise have bought. Second, the estimates here assume that the crises in Asian currency and financial markets will stabilize quickly and that there are no further rounds of competitive devaluations in China or Japan. Finally, the assumption of successful offsetting policy from the Fed is optimistic. In the real world where people, firms, and governments interact, the Fed will be hard pressed to keep unemployment from rising, especially in the short run.

States will suffer job losses and severe dislocations

Figure 1 illustrates the gross impact of a $100 billion rise in the trade deficit on employment in the 50 states; **Figure 2** shows the net effect assuming a completely successful offset policy by the Federal Reserve.[3] **Table 1** provides specific estimates for each state of a $100 billion and $200 billion increase in the trade deficit, either of which would generate gross employment losses in all 50 states (see columns 1 and 3). Particularly hard-hit states include California; Texas; the industrial heartland states in the upper Midwest, such as Illinois, Michigan, Ohio, and Indiana; and apparel centers such as New York, Pennsylvania, and the Carolinas. California alone will lose more than 120,000 jobs. If the trade deficit increases by $200 billion, each of these regional effects will be doubled (column 3).

Even if the Fed perfectly manages interest rates to offset the trade deficit, 20 states will suffer a net loss of employment if the trade deficit rises by $100 billion (column 2). California, with its huge industrial base located on the Pacific Rim, will be hardest hit with 25,000 jobs lost, followed closely by North Carolina, with its large textile and apparel industries (20,000), Michigan (9,000), and Indiana (7,500). On the other hand, Florida will see the creation of about 50,000 jobs in non-traded goods (not shown), enough to more than offset a gross loss of 36,000 jobs and produce a net gain of 14,000 jobs. Employment in Florida and every other state will shift from manufacturing industries, such as electronics, to lower-paying service sectors. Thus, even states that report net gains in columns 2 and 4 will still experience substantial job displacement, and some communities and areas in each state will grow while others suffer.

FIGURE 1

ALL STATES LOSE JOBS
Effect of $100 billion increase in trade deficit, no change in Fed policy

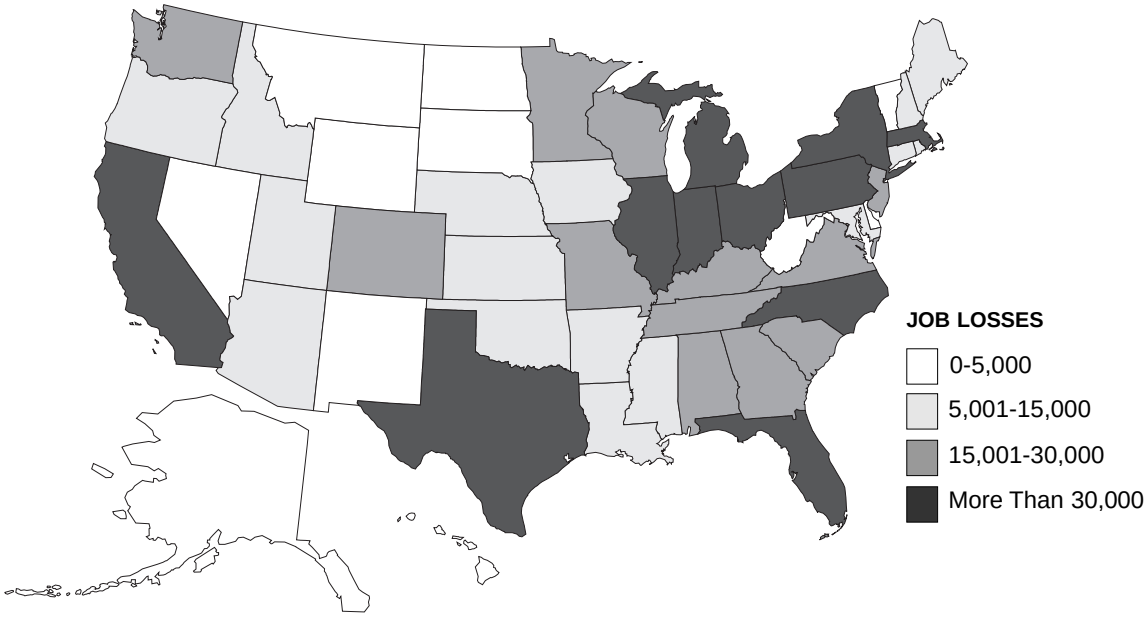

FIGURE 2

SIGNIFICANT DISLOCATION, EVEN IF FED INTERVENES
Net effect of $100 billion increase in trade deficit, offsetting monetary policy

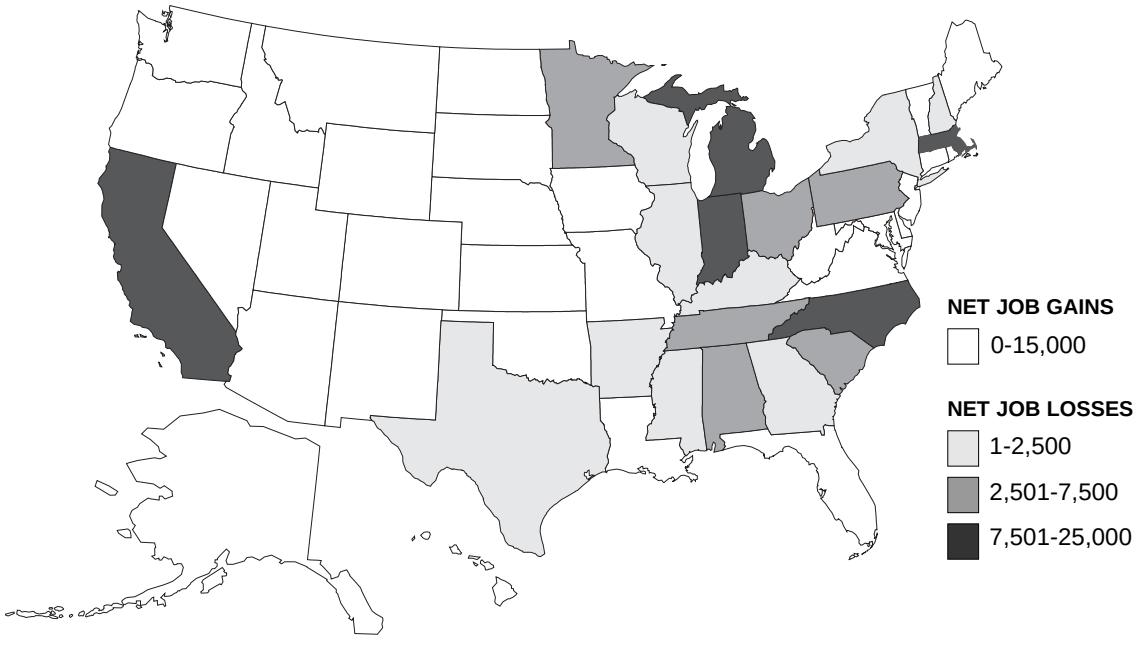

TABLE 1
Job Changes Induced by Increased Trade Deficits, by State

	$100 Billion Increase in Trade Deficit	Net of Offsetting Monetary Policy	$200 Billion Increase in Trade Deficit	Net of Offsetting Monetary Policy
Alabama	(20,927)	(4,077)	(41,854)	(8,155)
Alaska	(848)	4,016	(1,696)	8,033
Arizona	(13,704)	2,802	(27,408)	5,604
Arkansas	(11,542)	(159)	(23,085)	(318)
California	(126,681)	(24,543)	(253,362)	(49,087)
Colorado	(15,524)	1,363	(31,048)	2,726
Connecticut	(14,051)	1,179	(28,102)	2,358
District of Columbia	(1,718)	5,302	(3,436)	10,603
Delaware	(2,586)	3,228	(5,172)	6,457
Florida	(35,772)	13,544	(71,544)	27,088
Georgia	(28,949)	(363)	(57,899)	(725)
Hawaii	(2,148)	5,124	(4,296)	10,248
Idaho	(5,445)	1,310	(10,890)	2,620
Illinois	(48,154)	(2,171)	(96,307)	(4,342)
Indiana	(32,089)	(7,543)	(64,179)	(15,085)
Iowa	(11,276)	2,572	(22,553)	5,144
Kansas	(7,575)	4,495	(15,150)	8,991
Kentucky	(17,036)	(1,563)	(34,072)	(3,125)
Louisiana	(8,928)	7,081	(17,857)	14,163
Maine	(6,932)	375	(13,864)	749
Maryland	(10,560)	8,643	(21,120)	17,287
Massachusetts	(33,480)	(7,884)	(66,960)	(15,767)
Michigan	(45,084)	(9,279)	(90,167)	(18,558)
Minnesota	(27,446)	(5,724)	(54,892)	(11,449)
Mississippi	(12,482)	(1,067)	(24,964)	(2,133)
Missouri	(22,035)	720	(44,071)	1,440
Montana	(1,999)	3,742	(3,998)	7,483
North Carolina	(50,063)	(19,789)	(100,126)	(39,577)
North Dakota	(1,854)	3,611	(3,708)	7,221
Nebraska	(5,391)	4,016	(10,783)	8,032
Nevada	(3,827)	5,220	(7,654)	10,440
New Hampshire	(8,066)	(886)	(16,133)	(1,773)
New Jersey	(26,905)	3,180	(53,810)	6,359
New Mexico	(4,171)	3,894	(8,341)	7,789
New York	(63,555)	(948)	(127,111)	(1,896)
Ohio	(49,919)	(7,039)	(99,837)	(14,079)
Oklahoma	(10,211)	2,642	(20,422)	5,285
Oregon	(12,906)	986	(25,813)	1,971
Pennsylvania	(47,751)	(4,346)	(95,501)	(8,693)
Rhode Island	(5,286)	1,193	(10,573)	2,386
South Carolina	(19,348)	(3,740)	(38,696)	(7,479)
South Dakota	(4,348)	1,438	(8,696)	2,877
Tennessee	(28,946)	(6,222)	(57,893)	(12,444)
Texas	(65,024)	(1,029)	(130,048)	(2,058)
Utah	(7,678)	1,884	(15,356)	3,768
Vermont	(2,589)	2,524	(5,177)	5,048
Virginia	(23,214)	3,273	(46,428)	6,546
Washington	(16,916)	4,103	(33,832)	8,206
West Virginia	(4,373)	3,589	(8,746)	7,179
Wisconsin	(25,242)	(2,279)	(50,484)	(4,558)
Wyoming	(1,191)	3,602	(2,382)	7,203
Total	**(1,053,747)**	**0**	**(2,107,493)**	**0**

Note: Columns (1) and (3) assume no change in Federal Reserve policy to offset the contractionary effects of a growing trade deficit. Columns (2) and (4) assume that the Fed enacts an expansionary monetary policy to hold employment exactly constant. "Job changes" means jobs or job opportunities gained or lost.

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

Widening trade deficit will severely damage manufacturing industries

If the U.S. trade deficit increases by $100 billion, then 1.1 million job opportunities will be eliminated in the domestic economy, as shown in the first column in **Table 2**.[4] These job losses will begin to accumulate by mid-1998, rising sharply thereafter as the trade deficit expands. The full effect will likely take hold over the next 12 to 24 months (through the end of 1999), and 70% of job losses will be concentrated in the manufacturing sector. Within manufacturing, the largest losses in absolute terms (column 1) will occur in industrial machinery (169,000 jobs lost, representing 8.1% of total employment in the sector), which includes computers and other office machinery, and in electronic equipment (122,000 jobs lost). These sectors will be hard hit because of their size and because of the direct, often intense, price competition between domestic and foreign producers. These industries are particularly important as key centers of high-tech, high-wage employment.

Other hard-hit sectors within manufacturing will include apparel (65,000 jobs), textile mill products (33,000), transportation equipment (48,000), and miscellaneous manufacturing (32,000).[5] Outside of manufacturing, the agricultural sector will also be significantly affected, with losses of 35,000 jobs or roughly 1% of total agricultural employment. Job losses in trade and services will be large in numerical terms but not as a share of total sectoral employment.

If the U.S. trade deficit increases by $200 billion, the impacts will be much larger. Nearly 1.5 million manufacturing jobs will be lost (Table 2, column 2), 7.9% of total manufacturing employment in 1996 (column 4). Losses of this scale would induce depression-like conditions in manufacturing communities, on a scale approaching the Rustbelt disaster of the early 1980s.

Fed intervention cannot protect traded goods industries

Table 3 reports the results of an assumption that the Fed will be able to reduce interest rates so precisely as to completely offset the overall employment effects of larger trade deficits, leaving overall employment unchanged (as indicated by the total of zero net job loss in columns 1 and 2). Even so, there will be substantial shifts in employment between sectors and regions. If the U.S. trade deficit expands by $100 billion, then manufacturing employment will fall by 569,000, 22% less than before adjusting for Fed actions but still substantial. Industrial machinery, electronic equipment, apparel, and transport equipment are still the most heavily affected sectors, losing 3% to 8% of total employment even when overall unemployment levels are unchanged.

This Fed-intervention scenario shows non-traded goods production growing rapidly to absorb the excess labor that will result from trade deficits. Employment in services increases by 198,000 (column 2), the government sector adds 153,000 employees, and trade (wholesale and retail) adds 114,000. In addition, net job losses in agriculture are substantially smaller than in Table 2, as increased income stimulates food demand and output.

If the U.S. trade deficit increases by $200 billion (Table 3, columns 2 and 4), the Fed's job will become much more difficult. Even if the Fed policy is successful, there will be much larger changes in

TABLE 2
Job Changes Induced by Increased Trade Deficits, by Sector, No Change in Fed Policy

	Induced Job Changes		Shares of Existing Employment	
	$100 Billion Scenario	$200 Billion Scenario	$100 Billion Scenario	$200 Billion Scenario
Agriculture, forestry, fisheries	(35,349)	(70,699)	-1.0%	-2.1%
Mining	(997)	(1,994)	-0.2%	-0.3%
Construction	(3,523)	(7,047)	-0.1%	-0.1%
Manufacturing	(726,134)	(1,452,268)	-4.0%	-7.9%
Lumber and wood products	(15,090)	(30,181)	-2.0%	-4.0%
Furniture and fixtures	(23,682)	(47,364)	-4.7%	-9.5%
Stone, clay, and glass products	(11,065)	(22,130)	-2.1%	-4.1%
Primary metal industries	(27,720)	(55,439)	-3.9%	-7.9%
Fabricated metal products	(38,065)	(76,129)	-2.6%	-5.2%
Industrial machinery and equipment	(168,734)	(337,468)	-8.1%	-16.2%
Electronic and other electrical equipment	(122,026)	(244,051)	-7.4%	-14.8%
Transportation equipment	(47,787)	(95,574)	-2.7%	-5.4%
Instruments and related products	(25,561)	(51,122)	-3.1%	-6.1%
Miscellaneous manufacturing industries	(31,932)	(63,863)	-8.3%	-16.6%
Food and kindred products	(8,889)	(17,778)	-0.5%	-1.1%
Tobacco products	(212)	(424)	-0.5%	-1.0%
Textile mill products	(33,499)	(66,998)	-5.3%	-10.5%
Apparel and other textile products	(64,694)	(129,389)	-7.6%	-15.3%
Paper and allied products	(12,893)	(25,786)	-1.9%	-3.8%
Printing and publishing	(16,277)	(32,555)	-1.1%	-2.1%
Chemicals and allied products	(20,479)	(40,959)	-2.0%	-4.0%
Petroleum and coal products	(1,190)	(2,381)	-0.9%	-1.7%
Rubber and miscellaneous plastics products	(28,989)	(57,978)	-3.0%	-6.0%
Footwear and leather products	(27,350)	(54,700)	-28.5%	-57.1%
Transportation	(31,076)	(62,151)	-0.8%	-1.5%
Communications	(6,059)	(12,119)	-0.4%	-0.9%
Utilities	(5,526)	(11,053)	-0.6%	-1.2%
Trade	(123,050)	(246,101)	-0.4%	-0.9%
Finance, insurance, and real estate	(8,181)	(16,362)	-0.1%	-0.2%
Services	(106,725)	(213,449)	-0.3%	-0.6%
Government	(7,126)	(14,251)	-0.0%	-0.1%
Total	(1,053,747)	(2,107,493)	-0.9%	-1.8%

Note: “Job changes” means jobs or job opportunities gained or lost.

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data. Sectoral “Existing Employment” data from BLS (1997a), except agriculture, forestry, and fisheries, from Council of Economic Advisors (1997, 338).

TABLE 3
Job Changes Induced by Increased Trade Deficits, by Sector, Net of Offsetting Fed Policy

	Induced Job Changes		Shares of Existing Employment	
	$100 Billion Scenario	$200 Billion Scenario	$100 Billion Scenario	$200 Billion Scenario
Agriculture, forestry, fisheries	(8,731)	(17,463)	-0.3%	-0.5%
Mining	3,476	6,952	0.6%	1.2%
Construction	51,421	102,841	1.0%	1.9%
Manufacturing	(568,824)	(1,137,648)	-3.1%	-6.2%
Lumber and wood products	(8,412)	(16,824)	-1.1%	-2.2%
Furniture and fixtures	(18,533)	(37,067)	-3.7%	-7.4%
Stone, clay, and glass products	(6,714)	(13,427)	-1.3%	-2.5%
Primary metal industries	(22,590)	(45,180)	-3.2%	-6.4%
Fabricated metal products	(26,905)	(53,810)	-1.9%	-3.7%
Industrial machinery and equipment	(152,251)	(304,502)	-7.3%	-14.6%
Electronic and other electrical equipment	(109,950)	(219,900)	-6.7%	-13.3%
Transportation equipment	(33,616)	(67,233)	-1.9%	-3.8%
Instruments and related products	(18,622)	(37,244)	-2.2%	-4.5%
Miscellaneous manufacturing industries	(26,999)	(53,997)	-7.0%	-14.0%
Food and kindred products	4,922	9,845	0.3%	0.6%
Tobacco products	92	183	0.2%	0.5%
Textile mill products	(26,804)	(53,608)	-4.2%	-8.4%
Apparel and other textile products	(52,669)	(105,338)	-6.2%	-12.4%
Paper and allied products	(7,694)	(15,388)	-1.1%	-2.3%
Printing and publishing	(3,079)	(6,158)	-0.2%	-0.4%
Chemicals and allied products	(12,795)	(25,589)	-1.3%	-2.5%
Petroleum and coal products	(51)	(101)	-0.0%	-0.1%
Rubber and miscellaneous plastics products	(21,314)	(42,627)	-2.2%	-4.4%
Footwear and leather products	(24,841)	(49,683)	-25.9%	-51.9%
Transportation	(716)	(1,432)	-0.0%	-0.0%
Communications	4,705	9,409	0.3%	0.7%
Utilities	1,975	3,950	0.2%	0.4%
Trade	114,059	228,119	0.4%	0.8%
Finance, insurance, and real estate	51,356	102,712	0.7%	1.5%
Services	198,430	396,861	0.6%	1.2%
Government	152,849	305,699	0.8%	1.6%
Total	0	0	0.0%	0.0%

Note: “Job changes” means jobs or job opportunities gained or lost.

Source: EPI analysis of Bureau of Labor Statistics and Census Bureau data. Sectoral “Existing Employment” data from BLS (1997a), except agriculture, forestry, and fisheries, from Council of Economic Advisors (1997, 338).

TABLE 4
Job Changes Induced by Increased Trade Deficits, by Demographic Group and Wage Level
(Thousands of Jobs)

	$100 Billion Scenario		$200 Billion Scenario	
	Job Changes		Job Changes	
	Induced by Increased Trade Deficit	Net of Offsetting Monetary Policy	Induced by Increased Trade Deficit	Net of Offsetting Monetary Policy
Total	(1,054)	0	(2,107)	0
Men	(639)	(91)	(1,278)	(181)
Women	(415)	91	(829)	181
White	(844)	(1)	(1,689)	(1)
Black	(91)	14	(181)	29
Hispanic	(60)	(6)	(120)	(12)
Other	(59)	(8)	(117)	(16)
College	(180)	18	(361)	36
Some College	(290)	41	(580)	83
High School	(356)	(30)	(712)	(61)
Less Than HS	(228)	(29)	(455)	(58)
Wage Bracket*				
High (75-99)	(261)	(45)	(523)	(91)
Medium (21-75)	(464)	(14)	(928)	(28)
Low (0-20)	(328)	59	(657)	119

* Wage brackets are based on the real 1979 wage distribution: numbers in parentheses are percentiles. In 1996 dollars, brackets correspond to hourly wages of less than $8.83; $8.84 to $19.08; and above $19.09.

Note: Columns (1) and (3) assume no change in Federal Reserve policy to offset the contractionary effects of a growing trade deficit. Columns (2) and (4) assume that the Fed enacts an expansionary monetary policy to hold employment exactly constant. “Job changes” means jobs or job opportunities gained or lost.

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

the composition of employment than in the $100 billion case. The manufacturing sector will shrink by 6.2%, while employment in services, government, and the finance sectors will increase by 1.2% to 1.6%. Again, most jobs in these sectors pay substantially less than those in traded goods industries.

Trade deficit will hit high-wage, non-college workers harder than others

Table 4 (previous page) shows the impact of increasing trade deficits on different groups of workers. Men will lose 639,000 to 1,278,000 jobs if deficits increase $100 billion to $200 billion (columns 1 and 3), 61% of total loses. Male workers are only 53% of the labor force, but since they make up a greater share of total employment in manufacturing they will suffer most heavily from a trade shock. While there are no great disparities in job loss by ethnicity, there are clear trends in the impact on workers by education and wage level. College-educated workers will lose 180,000 jobs (17% of total losses) with a $100 billion trade deficit, but they make up 19% of the labor force. Workers with less than a high school education will lose 228,000 jobs (22% of total losses), but they make up only 19% of the labor force. On the other hand, 25% of the jobs destroyed will be of the high-wage variety, while only 21% of jobs in the economy fall into this group. At the bottom of the wage ladder, only 31% of the jobs destroyed will be in the low-wage category, although such jobs make up 36% of the economy. For a $200 billion deficit, the number of jobs lost in each category double, while the shares remain the same.

These results show that an increase in U.S. trade deficits will eliminate relatively more high-wage jobs, especially for workers with less than a college education, and these workers will bear the brunt of the economic dislocation that will result from bigger trade deficits. Manufacturing and other traded goods industries employ a larger-than-average proportion of non-college-educated production workers, yet, for reasons that include the high productivity of manufacturing relative to other sectors of the economy, these sectors pay their workers better-than-average wages.

If the Fed is able to prevent an increase in unemployment, the new jobs will offset lost jobs to leave little or no differential impact on employment by ethnic group. However, with a $100 billion deficit, workers with a college education (either a degree or some college) will gain 59,000 jobs.[6] Workers with a high school degree or less will suffer an equivalent net loss of jobs.

Even though bigger trade deficits will increase demand for college-educated workers — if the Fed keeps unemployment rates steady — there will still be a net loss of high- and medium-wage jobs. Job gains will primarily be those paying lower wages: the bottom quintile of the labor force will see a net increase of 59,000 jobs (column 2). Therefore, the increase in demand for college-educated workers will be concentrated in lower-paying positions. This finding illustrates the continuation of a previously noted trend: even while the share of college graduates in the labor force rises, shifts in labor demand are primarily creating jobs with below-average wages (Mishel, Bernstein, and Schmitt 1997).

— January 1998

Appendix — Methodology

Throughout this report, we use the Bureau of Labor Statistics' 183-industry categorization of the U.S. economy. We use 1995 final demand data as the baseline for changing trade and for macroeconomic effects (BLS 1997b). We assume that the currency crises throughout Southeast Asia will cause the U.S. trade deficit to grow by $100 billion and $200 billion (see Hale 1997; *The Economist* 1997).

The last similar period of appreciation of the U.S. dollar was in the early 1980s. Between 1981 and 1985, real U.S. imports increased by 50%, while real exports fell by 6%. We consider the industry-level changes in imports and exports, using data from the Bureau of Labor Statistics, Office of Employment Projections (BLS 1997b), and assume that the current expansion of trade will be distributed among industries in the same pattern. If trade in each industry were to change by the same fraction as it did in 1981-85, the trade deficit would rise by over $762 billion, which is unrealistic. Thus, to yield an increase in the trade deficit of $100 billion we scaled the change back by a constant multiple of 0.131. In other words, the percentage changes of exports and imports in each industry are expected to be 13.1% as large as they were between 1981 and 1985. In aggregate, then, exports are expected to increase by a modest 0.3% and imports to balloon by 11.7%. In the $200 billion scenario we use a multiplier of 0.262, producing export growth of 0.7% and import growth of 23.5%.

To estimate the employment impacts of the increased trade, we use the 1995 input-output package — the most recent version available — from the Bureau of Labor Statistics' Office of Employment Projections.[7] This package includes an input-output table, derived from BLS calculations of the number and types of jobs supported by production in each industry. The table reflects not just the direct labor requirements of manufacturing production, but also the indirect employment in non-manufacturing industries (like business services) that supply manufacturers.

Labor content studies of this type typically measure job opportunities, rather than jobs, for two reasons. First, in a growing economy we expect a certain level of background employment growth. In this situation, increases in trade deficits may lead to lower job creation than would otherwise occur, without producing actual declines in employment. Second, some particular imported products are not produced in the U.S., so increases in their consumption do not directly displace domestic workers. However, employment in manufacturing has been declining in absolute terms since 1995, and is likely to decline even more rapidly in 1998 and 1999 as a result of the unexpected increase in trade deficits discussed in this report. Therefore, the terms "jobs" and "job opportunities" are used interchangeably in this analysis.

Offsetting Fed Policies

In several calculations, we include an assumption that the Federal Reserve Bank will intervene in the economy — by lowering interest rates — to offset the effects of rising trade deficits. This matches the conventional wisdom: prior to the Asian financial crisis, economic forecasters were widely predicting that the Fed would raise interest rates in 1998. However, many of these forecasters have recently revised their interest rate forecasts sharply downward, and now conclude that rates will stay constant or fall in the next year (Berry 1998). Our model of a net interest rate reduction in response to the crisis is an equivalent counterfactual scenario, in the context of a constant demand model. As a result, final demand less net exports (exports minus imports) increases just enough to keep unemployment unchanged. A $63 billion increase in non-trade final demand is required to offset a $100 billion increase in the trade deficits. We model this as a uniform 0.83% expansion of all non-trade final demand. The increase in non-trade final demand is smaller in dollar terms than the decrease in net exports because fewer dollars of spending are required to generate a given number of jobs in non-traded goods sectors (i.e., services) than in traded goods (such as manufactured products). Traded goods sectors pay higher wages and are more capital intensive than other sectors of the economy; therefore, fewer jobs are generated per dollar of final demand (see Scott, Lee, and Schmitt 1997).

State and Demographic Effects

We assume that job gains or losses in each of the 183 industries are distributed among the states in the same proportions as total employment. Data on total employment by state and industry come from BLS (1997c). Similarly, we assume that the casualties and beneficiaries in each industry are demographically similar to that industry's overall workforce; we use Census Bureau data (from the Public Use Microdata Sample of the 1990 Census) for this demographic information. See Rothstein and Scott (1997a and 1997b) for more information.

Technical Notes

We use the Bureau of Labor Statistics' 183-industry categorization of the U.S. economy throughout. We start with 183 x 1 vectors for 1993 exports ($\mathbf{x}^{95}$), imports ($\mathbf{m}^{95}$), and final demand ($\mathbf{fd}^{95}$) by industry. We assume that increased trade with Asia will be distributed among industries in the same pattern as was the increase in U.S. trade between 1981 and 1985. That is, exports in industry *i* (where *i* is indexed from industry 1 to 183) should increase in proportion to $(x_i^{85} - x_i^{81})/\, x_i^{81}$ and imports in that industry should increase in proportion to $(m_i^{85} - m_i^{81})/\, m_i^{81}$. As the trade data is measured in 1992 dollars, we use BLS industry-level price indices (BLS 1997d)[8] to inflate each industry's total, and choose the constant of proportionality such that the total of these inflated changes yields the desired increase in the trade deficit of $100 billion to $200 billion (in 1996 dollars). Thus, the increase of trade in the $100 billion scenario (indicated by the superscript Δ100) yields a proportionality constant of 0.131 and a change in industry *i* net exports, $nx_i^{\Delta 100}$, of:

$$nx_i^{\Delta 100} = 0.131*(x_i^{95}(x_i^{85} - x_i^{81})/\, x_i^{81} - m_i^{95}(m_i^{85} - m_i^{81})/\, m_i^{81}).$$

We use an input-output table, derived from BLS calculations, of the number and types of domestic jobs supported by production in each industry. This table reflects not just the direct job requirements of manufacturing production, but also the indirect employment in nonmanufacturing industries (like business services) that supply manufacturers. Let $\mathbf{\Omega}$ be this input-output matrix.[9] Then the vector $\mathbf{j}^{\Delta 100}$, calculated by $\mathbf{j}^{\Delta 100} = \mathbf{\Omega} \cdot \mathbf{nx}^{\Delta 100}$, indicates the jobs created or displaced in each of the 183 industries by the change in domestic production implied by the change in net exports $\mathbf{nx}^{\Delta 100}$. Because each of these calculations is linear in the size of the change in trade, $\mathbf{j}^{\Delta 200} = 2\,\mathbf{j}^{\Delta 100}$.

To calculate the effect of Federal Reserve actions to hold total employment constant, we assume that the Fed's macroeconomic policy acts as a scalar multiple on overall final demand. Thus, Fed policy creates an increase in final demand of $c\mathbf{fd}^{95}$ and an employment increase of $c\mathbf{\Omega} \cdot \mathbf{fd}^{95}$, where *c* is a parameter chosen to keep total employment constant. In the $100 billion scenario, choosing c=0.0083 results in the desired zero net change in total employment, $c\mathbf{\Omega} \cdot \mathbf{fd}^{95} + \mathbf{j}^{\Delta 100} = 0$ (in the $200 billion scenario, use c=0.0166). Note, however, that because import-competitive industries may have different labor requirements than average industries, it is not the case that $c\mathbf{fd}^{95} = -\mathbf{nx}^{\Delta 100}$.

To estimate demographic impacts, we use Census Bureau data (from the Public Use Microdata Sample of the 1990 Census) to derive demographic characteristics of each industry. We assume that the casualties and beneficiaries in each industry are demographically similar to the industry as a whole. Thus, if $\mathbf{a}$ is the vector of African American representation in each industry (where a_i is the fraction of industry *i*'s workforce that is African American), then for the $100 billion scenario $\mathbf{a} \cdot \mathbf{j}^{\Delta 100}$ represents the number of African Americans displaced by increased trade. We distribute impacts among the states similarly, using state shares of industry-level employment (from BLS 1997c).

TABLE A1
Change in Trade Balance, by Sector

	Millions of 1996 Dollars		Percent of 1995 Domestic Output	
	$100 Billion Scenario	$200 Billion Scenario	$100 Billion Scenario	$200 Billion Scenario
Agriculture, forestry, fisheries	(1,539)	(3,079)	-0.5%	-1.1%
Mining	1,460	2,919	1.1%	2.1%
Construction	10	20	0.0%	0.0%
Manufacturing	(92,942)	(185,885)	-2.7%	-5.4%
Lumber and wood products	(664)	(1,328)	-0.6%	-1.2%
Furniture and fixtures	(1,775)	(3,549)	-3.3%	-6.6%
Stone, clay, and glass products	(834)	(1,668)	-1.1%	-2.2%
Primary metal industries	(1,208)	(2,416)	-0.7%	-1.4%
Fabricated metal products	(1,450)	(2,900)	-0.7%	-1.4%
Industrial machinery and equipment	(40,272)	(80,543)	-11.0%	-22.0%
Electronic and other electrical equipment	(13,356)	(26,712)	-4.7%	-9.3%
Transportation equipment	(11,541)	(23,082)	-2.5%	-5.0%
Instruments and related products	(3,214)	(6,428)	-2.3%	-4.7%
Miscellaneous manufacturing industries	(3,562)	(7,123)	-7.4%	-14.8%
Food and kindred products	(1,530)	(3,060)	-0.3%	-0.7%
Tobacco products	(155)	(309)	-0.4%	-0.8%
Textile mill products	(607)	(1,215)	-0.8%	-1.5%
Apparel and other textile products	(5,554)	(11,109)	-6.7%	-13.4%
Paper and allied products	(1,002)	(2,004)	-0.6%	-1.2%
Printing and publishing	(333)	(665)	-0.2%	-0.3%
Chemicals and allied products	(2,540)	(5,080)	-0.7%	-1.4%
Petroleum and coal products	(486)	(972)	-0.3%	-0.5%
Rubber and miscellaneous plastics products	(1,018)	(2,036)	-0.7%	-1.4%
Footwear and leather products	(1,842)	(3,685)	-21.8%	-43.5%
Transportation	255	510	0.0%	0.1%
Communications	129	257	0.0%	0.1%
Utilities	194	388	0.1%	0.1%
Trade	(123)	(246)	-0.0%	-0.0%
Finance, insurance, and real estate	1,910	3,821	0.1%	0.2%
Services	(577)	(1,155)	-0.0%	-0.0%
Government	18	36	0.0%	0.0%
Special Industries	(8,794)	(17,587)	-6.7%	-13.5%
Total	**(100,000)**	**(200,000)**	**-0.8%**	**-1.6%**

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

Endnotes

1. Several economists have forecast a $100 billion increase in the merchandise trade deficit. For example, in testimony before a House Banking subcommittee, David Hale stated that "it is not difficult to imagine the U.S. trade deficit expanding to the $250 [billion] to $300 billion range by early 1999 from $192 [billion] in 1996" (Hale 1997). Fred Bergsten told *The Economist* that an upcoming study by the Institute for International Economics predicted the deficit to grow by $100 billion in 1998 alone (*The Economist* 1997). These estimates (Hale's in particular) were made before the full extent of the crisis was known, and it is possible that the ultimate effect will be even greater. Thus, the estimates in this paper also include the effect of a $200 billion increase in the trade deficit.

2. EPI analysis of Current Population Survey outgoing rotation group (ORG) data has shown that wages in the lowest decile of workers began to rise in real terms in 1997 over the previous year (see Webster 1997 for details on the methodology behind these unpublished calculations). However, real wages for this group remain 16% below those of workers in the lowest decile in 1979.

3. The models and data sources used in this analysis are described in the appendix.

4. The relationship between jobs and job opportunities is discussed in the appendix.

5. Significant job losses are also predicted for footwear, especially as a share of current employment. However, this particular estimate probably overstates the role of trade, since by 1996 imports had largely captured the likely market in this sector. Unlike in 1981-95, there is now little domestic employment in this sector. These sectoral job losses, 2.5% of the total, will be spread over the other traded goods sectors. Therefore, other sectoral job impacts will be proportionately (up to 2.5%) larger.

6. The net demographic impacts of a $200 billion increase are, in general, twice as large as those of a $100 billion increase.

7. See Franklin (1997) and related articles as referenced on the BLS Office of Employment Projections web site.

8. An exception is made for the "Computer and Office Equipment" industry (BLS industry 43), for which we use nominal dollars throughout. The price index for this industry shows massive deflation, reflecting explosive improvement in computer technology. A given amount of money buys a lot more computer power today than in 1992; however, roughly the same number of worker-hours are used to produce a Pentium II computer now as a 386 computer several years ago. Therefore, it is reasonable to assume that the number of workers employed by a million dollars of computer production has not changed dramatically. This assumption is not of great consequence for the results; deflating this industry normally produces only minor changes in the macroeconomic results.

9. We use the 1995 Domestic Employment Requirements table (BLS 1997b), which attempts to estimate only the domestic employment required for a given level of production.

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