6-30-2001

Impact of U.S.-China Trade Relations on Workers, Wages, and Employment: Pilot Study Report

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Abstract
[Excerpt] In the fall of 2000, legislation was enacted by the U.S. Congress to establish a bipartisan commission to investigate, assess, and report to Congress on the economic and security implications of the bilateral economic relationship between the U.S. and China. Unfortunately, to date no government body in the U.S. has had the responsibility for collecting comprehensive national data on the wage and employment effects of trade agreements and policies. Because of this deficit of information, the U.S. Trade Deficit Review Commission contracted with a team of researchers from Cornell University and the University of Massachusetts Amherst to conduct a pilot study to lay the groundwork for more comprehensive research to monitor and analyze the impact of U.S.-China trade relations on workers, wages, and employment in the U.S. The purpose of the pilot study was twofold. The first component involved designing and implementing a media-tracking system to monitor and analyze media coverage of the employment and wage effects of China trade and investment by tracking all media reported production shifts out of the U.S. to China, Mexico, and other Asian and Latin American countries and out of Asian and Latin American countries into China that occurred between October 1, 2000 and April 30, 2001. Because of the lack of government data in this area, the media-tracking study is the first and only national database on production shifts out of the U.S. The second component of the study involved collecting and analyzing macro data on imports, exports, and foreign direct investment in those industries and economic sectors that have an active trade, investment, and production relationship with China. In combination, findings from the media-tracking and macroeconomic data provide further evidence that U.S.-China trade and investment policies have had, and will continue to have, a significant impact on employment and wages for workers in the U.S. and other countries actively involved in trade and/or investment with China. The study also lays the groundwork for future research on the economic impact of U.S-China trade relationships and demonstrates the importance of government-mandated corporate reporting requirements for all companies shifting goods, investments, or production in and out of the U.S.

Keywords
wages, employment, trade, China, United States, Congress

Comments
Suggested Citation

Bronfenbrenner, K., Burke, J., Luce, S., Hickey, R., Juravich, T. Braunstein, E., & Epstein, J. (2001). *Impact of U.S.-China trade relations on workers, wages, and employment: Pilot study report* [Electronic version]. Washington, DC: U.S.-China Security Review Commission/U.S. Trade Deficit Review Commission.

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IMPACT OF U.S.-CHINA TRADE RELATIONS ON WORKERS, WAGES, AND EMPLOYMENT

PILOT STUDY REPORT

Submitted to the
U.S.-China Security Review Commission/U.S. Trade Deficit Review Commission

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June 30, 2001

EXECUTIVE SUMMARY

In the fall of 2000, legislation was enacted by the U.S. Congress to establish a bipartisan commission to investigate, assess, and report to Congress on the economic and security implications of the bilateral economic relationship between the U.S. and China. Unfortunately, to date no government body in the U.S. has had the responsibility for collecting comprehensive national data on the wage and employment effects of trade agreements and policies. Because of this deficit of information, the U.S. Trade Deficit Review Commission contracted with a team of researchers from Cornell University and the University of Massachusetts Amherst to conduct a pilot study to lay the groundwork for more comprehensive research to monitor and analyze the impact of U.S.-China trade relations on workers, wages, and employment in the U.S. The purpose of the pilot study was twofold. The first component involved designing and implementing a media-tracking system to monitor and analyze media coverage of the employment and wage effects of China trade and investment by tracking all media reported production shifts out of the U.S. to China, Mexico, and other Asian and Latin American countries and out of Asian and Latin American countries into China that occurred between October 1, 2000 and April 30, 2001. Because of the lack of government data in this area, the media-tracking study is the first and only national database on production shifts out of the U.S. The second component of the study involved collecting and analyzing macro data on imports, exports, and foreign direct investment in those industries and economic sectors that have an active trade, investment, and production relationship with China. In combination, findings from the media-tracking and macroeconomic data provide further evidence that U.S.-China trade and investment policies have had, and will continue to have, a significant impact on employment and wages for workers in the U.S. and other countries actively involved in trade and/or investment with China. The study also lays the groundwork for future research on the economic impact of U.S-China trade relationships and demonstrates the importance of government-mandated corporate reporting requirements for all companies shifting goods, investments, or production in and out of the U.S.

Major highlights of the research include:

- In the past decade U.S. trade and investment with China has increased dramatically. Today, China has become the U.S.'s fourth largest trading partner, following, Canada, Mexico, and Japan while foreign direct investment (FDI) in China by U.S. firms has increased from only $200 million in 1989 to more than $7.8 billion in 2000. However, contrary to the high expectations that China's 1.2 billion population would provide an ever-expanding market for U.S. goods, by 2000 the value of goods imported to the U.S. from China exceeded the value of U.S. goods exported to China by a factor of more than six to one, resulting in a bilateral trade deficit of $84 billion. Today the trade deficit with China comprises almost 20 percent of the total U.S. trade deficit and is the largest trade deficit the U.S. has with any single nation.

- The U.S. has not been the only nation expanding its trade and investment relationship with China. Overall, China's foreign trade worldwide increased from only $20 billion in the late 1970s to $475 billion by 2000. Similarly, by the end of the 1990s the total world FDI in China accounted for a third of FDI in all developing countries combined.

- In the months since the enactment of Permanent Normal Trade Relations (PNTR) legislation with China there has been an escalation of production shifts out of the U.S. and into China. According to our media-tracking data, between October 1, 2000 and April 30, 2001 more than eighty corporations announced their intentions to shift production to China, with the number of announced production shifts increasing each month from two per month in October to November to nineteen per month by April. The estimated number of jobs lost through these production shifts to China was as high as 34,900, compared to 29,267 jobs lost to Mexico, 9061 jobs lost to

other Asian countries, and fewer than 1000 jobs lost to other Latin American countries. However, because we believe our media tracking captures fewer than half of all production shifts out of the U.S. to China and other countries during this period, we estimate that the actual number of jobs lost through production shifts to China and Mexico averages between 70,000 and 100,000 jobs each year for each country. This is in keeping with our preliminary macroeconomic analysis of the employment affects of U.S.-China trade balance that estimates as many 760,000 U.S. jobs have been lost due to the U.S.-China trade deficit since 1992.

- Production shifts out of the U.S. into China are highly concentrated in certain industries: electronics and electrical equipment (37 percent), chemicals and petroleum products (17 percent), household goods (11 percent), toys (8 percent), textiles (6 percent), plastics (6 percent), sporting goods (5 percent), and wood and paper products (5 percent). This contrasts with production shifts out of the U.S. to other Asian countries where nearly two-thirds of production shifts were in electronics and electrical equipment and with production shifts from the U.S. to Mexico, where 20 percent of production shifts were in industries such as automobiles, auto parts, metal fabrication, and machinery. Production shifts to China were also concentrated in certain regions and states, in particular the Southeast and West Coast. California was hardest hit, accounting for 14 percent of all production shifts to China, followed by North Carolina (11 percent), and Texas (10 percent).

- The U.S. companies that are shutting down and moving to China and other countries tend to be large, profitable, well-established companies, primarily subsidiaries of publicly-held, U.S.-based multinationals including such familiar names as Mattel, International Paper, General Electric, Motorola, and Rubbermaid. Most have been in operation for nearly half a century. However, a third have had new ownership in the last ten years.

- The media-tracking data also suggest that the majority of the U.S.-based multinational corporations shifting production to China are not simply targeting a Chinese market. Companies such as La Crosse Footwear (winter boots), Lexmark (printers), Motorola (cell phones), Rubbermaid (cookware and storage products), Raleigh (bicycles), Cooper Tools (wrenches), Mattel Murray (Barbie doll playhouses), and Samsonite (luggage), may have moved their production to China, but still intend to serve a U.S. and global market.

- According to our media-tracking data, from October 2000 to April 2001, 4,909 U.S. union jobs were lost due to production shifts to China, which represents 14 percent of all jobs lost to China during this period. This contrasts with production shifts to Mexico, where during the same seven-month period unions lost a total of 13,560 members through production shifts to Mexico, which represents 46 percent of all jobs lost through production shifts to Mexico from October 2000 through April 2001. The smaller number of union jobs lost to China reflects the fact that companies moving to China are concentrated in industries with lower union density, such as electronics and electrical equipment. However, all this may change once China enters the World Trade Organization (WTO), and, as they did with NAFTA, employers begin to look to our China trade policy as an opportunity to weaken or eliminate existing unions where they do exist and prevent unionization where it has not yet taken hold.

- While at one time the majority of production shifts into China may have been concentrated in relatively low-skill, low-wage jobs in light manufacturing industries such as apparel and textiles, our media-tracking data paint a much more complex picture of the work that is leaving the U.S. to go to China. Just as our macroeconomic findings suggest that U.S. firms are increasingly

investing in more complex, higher-end industries in China, including petrochemicals, machinery, finance, metals, and electronics and electrical equipment, our media-tracking data suggest that an increasing percentage of the jobs leaving the U.S. are in higher-paying industries producing goods such as bicycles, furniture, motors, compressors, generators, fiber optics, clocks, injection molding, and computer components. As our data show, it is these higher-end jobs that are most likely to be unionized and therefore more likely to have a much larger wage and benefit package. Many of those who lost their jobs were high seniority, top-of-the-pay scale employees, who have a great deal invested in their jobs and in their communities.

- In combination our media-tracking and macroeconomic findings suggest that there is a direct linkage between increases in trade deficits and foreign direct investment in certain industries and production and employment shifts out of the U.S. and into China in those industries. The U.S.-China trade deficit is highest ($17 billion) and increasing the fastest in electronics and electrical equipment, the industry where we found the greatest number of U.S.-China production shifts and the industry where we found the highest level of FDI in China by U.S. firms. We also found high (and rapidly increasing) levels of trade deficits in other industries where U.S.-China production shifts were concentrated including textile/apparel, toys and sporting goods, household goods, and wood and paper products. This is further supported by the preliminary findings of our regression analysis on the impact of FDI on trade, which suggests that for every 10 percent increase in U.S. FDI in China there was a 6.3 percent increase in the level of imports from China to the U.S., with no statistically significant effect on the level of exports from the U.S. to China.

- The employment effects of these production shifts go well beyond the individual workers whose jobs were lost. Each time another company shuts downs operations and moves work to China, Mexico, or any other country, it has a ripple effect on the wages of every other worker in that industry and that community, through lowering wage demands, restraining union organizing and bargaining power, reducing the tax base, and reducing or eliminating hundreds of jobs in the related contracting, transportation, wholesale trade, professional, and service-sector employment in companies and businesses.

- The wage and employment effects of U.S.-China trade relations are not felt in the U.S. alone. Our media-tracking findings suggest a massive shifting of employment around the world, from the U.S. and Europe to Asia and Latin America, and from Asian and Latin American countries to other countries within or outside their regions, always in the quest for the lowest production costs and the greatest profits. Contrary to the promise of rising wages and living standards that free trade and global economic integration were supposed to provide, in many countries these global production shifts have led to decreases in employment, stagnating wages, and increasing income inequality.

- In conclusion, our research suggests that the U.S. and other countries have moved ahead with trade policies and global economic integration based on faulty arguments and incomplete information. The findings from this pilot study are a first step toward better informing the U.S.-China trade policy process. The findings also point to the critical need for government-mandated corporate reporting on production, trade and investment flows in and out of the U.S, and for further research on the impact of those trade and investment flows on workers, unions, families, and communities in the U.S. and around the globe.

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PART I: INTRODUCTION

In 1992 the United States government signed a Memorandum of Understanding with China under which China agreed to enforce U.S. intellectual property rights and open its markets to U.S. goods. The new agreement was hailed as a breakthrough for U.S. trade relations that would provide "American businesses, farmers, and workers with unprecedented access to a rapidly growing market" (Faux 2000: 5). Since that time China has become the U.S.'s fourth largest trading partner, after Canada, Mexico, and Japan. However, contrary to the high expectations that China's 1.2 billion population would provide an ever-expanding market for U.S. goods, by 2000 the value of imported goods from China exceeded the value of U.S. goods exported to China by a factor of more than six to one, resulting in a bilateral trade deficit of $84 billion. This trade deficit with China comprises almost 20 percent of the total U.S. trade deficit, and as such is the largest trade deficit the U.S. has with any single nation (Braunstein, Burke, and Epstein 2001).

During this same time period, foreign direct investment (FDI) in China by U.S. firms has increased dramatically, expanding from only $200 million in 1989 to more than 7.8 billion today (Braunstein, Burke, and Epstein 2001). But the U.S. has not been the only nation expanding its trade and investment relationship with China. Overall, China's foreign trade worldwide increased from only $20 billion in the late 1970s to $475 billion by 2000. Similarly, by the end of the 1990s the total world FDI in China accounted for a third of FDI in all developing countries combined (Lardy 2001).

This expansion of China's role in the global economy came before the United States Congress enacted legislation granting permanent normal trade relations (PNTR) to China in the fall of 2000, clearing the way for China to enter the World Trade Organization later in 2001. In

Congressional debates leading to the passage of PNTR legislation there was a great deal of discussion regarding the possible implications that the China trade bill might have for the U.S. economy, particularly the impact on wages and employment for U.S. workers. On the one hand those actively lobbying for PNTR, such as National Association of Manufacturers' President Jerry Janinowski, argued that, across the board PNTR would "increase opportunities for American manufacturers and their workers" (US-China Business Council 2000). Similarly, the US-China Business Council (1999) claimed that in addition to providing cheap consumer goods, the trade agreement would allow U.S. companies facing "mature markets at home" to "look to the Chinese market to grow and remain competitive globally." Others, such as economists Gary Hufbauer and Daniel Rosen, totally dismissed claims that PNTR would have an adverse impact on employment and wages, claiming, "without PNTR, the United States would lose more than half the anticipated export gains of goods and services combined in the Chinese market" (Hufbauer and Rosen 2001:5).

Those opposing PNTR presented a very different view on its possible effects on the U.S. economy. Ohio Republican, Representative Bob Ney warned of the impact of the bill on American jobs. "This is a greed agreement. . . . It only helps a few at the top," said Rep. Ney. "We're going to lose hundreds of thousands of jobs here in America" (Deans 2000:2E). His words were echoed by then United Steelworkers of America President George Becker who called the drive for PNTR "nothing more than greedy multinationals capitalizing on Chinese labor at dirt-cheap prices" (USWA News 2000: 1).

This perspective was backed by economists such as Robert Scott of the Economic Policy Institute, who argued that with the passage of PNTR and the increased trade deficits it

will engender, "every industry" and "every state will suffer significant job losses over the next decade" totaling more than 870,000 by the end of the decade (Scott 2000: 2).

American Enterprise Institute economist Irwin Stelzer argues that trade policies such as PNTR create "losers as well as winners. It benefits consumers while, at times, harming some workers and investors. Unless one is prepared to argue that there is some ethical reason why consumers are to be given preference over producers when making policy, this clash of interests must somehow be taken into account in formulating trade policy" (Stelzer 2001: 16).

Needless to say, determining how to measure the benefits versus costs of U.S.-China trade policies is a challenge for both researchers and policy makers. Unfortunately, to date no government body in the U.S. has had the responsibility for collecting comprehensive national data on the wage and employment effects of trade agreements and policies. Thus we have no established structures or systems to monitor the economic impact of expanding trade and economic ties with China. Specifically, we have no way to track which companies in which industries are shifting production to China and the workers, jobs, and communities impacted by those production shifts.

Even the macro trade and investment data supplied by the U.S. and Chinese governments are filled with holes and contradictions to the point that there is not even universal agreement on the total value of imports and exports between the U.S. and China, total U.S. foreign direct investment in China, or the actual size of the trade deficit between the U.S. and China.[1] Yet, despite the fact that there are few hard numbers and little solid research to inform the debate on the impact of U.S.-China trade on wages and employment, policy makers have been moving

[1] For a full discussion of the debate on import and export values and the trade balance see page 64.

forward to cement the new trade relationship between the two countries. As Harvard economist Dani Rodrik explains, "the new agenda of global integration rests on shaky empirical ground and seriously distorts policy makers' priorities" (Rodrik 2001:55).

To compensate for this deficit of information, in February 2001 the newly established U.S.-China Security Review Commission[2] asked a team of scholars from Cornell University and the University of Massachusetts Amherst, under the direction of Dr. Kate Bronfenbrenner from Cornell, to put together a pilot study to lay the groundwork for more comprehensive research to monitor and analyze the impact of U.S.-China trade relations on workers, wages, and employment in the U.S. [3]

The purpose of the pilot study was twofold. The first component involved designing and implementing a media-tracking system to monitor and analyze media coverage of employment and wage effects of China trade and investment from October 1, 2000 through April 30, 2001. Using online and library sources, we collected and tracked print news stories from U.S. and international media (including Chinese media) on capital mobility, foreign direct investment, wages, and employment in those industries and economic sectors that are involved in either direct or indirect trade and production relationships with China. We also conducted follow-up

[2]The U.S.-China Security Review Commission was established by Congress under the Fiscal 2001 National Defense Authorization in October 2000. In the enabling legislation, Congress designated members and staff of the U.S. Trade Deficit Review Commission, the predecessor of the U.S.-China Security Review Commission, to handle the responsibilities of the new China Commission until Congress could appoint a full complement of twelve commissioners in February and March 2001. Because the China Commission was not fully operational until early April, this study originated under the auspices of the Trade Deficit Review Commission, but this final report will be submitted to the China Commission.

[3]Project principle investigators include Kate Bronfenbrenner, Cornell ILR; Gerald Epstein and Elissa Braunstein, Political Economy Research Institute, UMass Amherst; and Tom Juravich and Stephanie Luce, Labor Relations and Research Center, UMass Amherst. In addition, the following individuals worked as research and administrative assistants on this project: Beth Berry, James Burke, Michael Davis, Dean Frutiger, Carolyn Gleason, Robert Hickey, Hyunji Kwon, Rattawut Lapcharoensap, Michael Ristorucci, Hilary Rhodes, Anne Sieverding, Miho Watanabe, and Mark Weisenborn.

online research on the companies involved to gain a better understanding of corporate structure and employment patterns. Data collected from the news stories and online corporate research have been compiled in a searchable Microsoft Access database as well as in an indexed printed report included in the appendices to this report.

The second component involved collecting and analyzing macroeconomic data on imports, exports, and foreign direct investment in those industries and economic sectors that have an active trade, investment, and production relationship with China, focusing on the last decade. This macro data analysis helps put the media-tracking data in the context of the larger trade and investment climate and lays the groundwork for future, more in-depth research that examines the relationship between international trade and foreign direct investment and wages, employment, and unionization in those industries and sectors.

In combination the two components of our pilot study provide baseline information on the impact of trade and investment with China on workers, wages, and employment in the U.S. that we hope helps inform the current debate on U.S.-China trade and investment policy and lays the ground work for future research to monitor changes over time in the nature and extent of capital mobility and foreign direct investment with China and other nations.

Report Outline

Following the introduction (Part I), this paper begins with a discussion of the research method and design (Part II) for both the media-tracking data collection process and the macroeconomic data analysis, including a discussion of the validity and reliability of the media-tracking research process.

Part III of the paper reports on the findings from our media-tracking data. The first section of Part III summarizes findings on media tracking of production shifts out of the U.S. to China, Mexico, and other Asian and Latin American countries from October 2000 through the end of April 2001, including data on estimated number of jobs lost, industrial sector, U.S. region of origin, company characteristics (including size, financial condition, base country, ownership structure, and company history), and union status. The next section summarizes media-tracking findings for production shifts out of Japan, Korea, Taiwan, and other Asian and Latin American countries to China for the same time period, and includes results on country of origin, industrial sector and company structure and characteristics (size, financial condition, parent company country, ownership structure, and company history).

Part IV of the paper reports on our macroeconomic findings relating to the U.S.-China trade and investment relationship. In the first section of part IV we analyze comparative trade data for both the U.S. and China, tracking changes in imports, exports, and trade deficits over the last decade and across industrial sectors. We next summarize the debate over the measurement of U.S.-China trade flows involving issues of re-exports, transshipments, transfer pricing, and differences in how the U.S. and China calculate the value of both imports and exports. We then analyze the relationship between trade deficits and employment and wages and how measurement questions should or should not affect the analysis of wage and employment effects.

In the second section of the macroeconomic data analysis we examine findings relating to the U.S.-China investment relationship. This analysis includes tracking changes in U.S. FDI in China over time and across industries, and using regression analysis to examine the relationship between U.S. FDI in China and U.S.-China trade balances.

The first section of Part V (Conclusion) pulls together the findings from both the media-tracking data and the macroeconomic analysis on the impact of trade and investment on workers, wages, and employment. The second section presents the implications of our findings for government data collection and public policy relating to U.S. trade and investment with China and other countries. In addition, this concluding section presents a proposal for future research that will build upon and expand the findings of this pilot study report. At the end of the report (Part VII, Appendices) we include several appendices providing more detailed information on the media-tracking industry data and further information in support of our macroeconomic data analysis.

PART II: RESEARCH METHOD AND DESIGN

Research Method and Design of the Media-tracking System

In designing the media-tracking system we concentrated on those industries most directly impacted by trade and investment with China and/or joint ventures and subcontracting of production with firms and facilities in China. The industries we selected include apparel, textiles, automobiles, auto parts, aerospace, appliances, electronics and electrical equipment, steel, metal fabrication, machinery, footwear, household goods, sporting goods, tires, banking services, wood and paper products, chemical and petroleum products, and toys.

For purposes of comparison and in order to monitor shifting global patterns of production shifts out of the U.S. and into China, we also collected comparative data on U.S. production shifts to other Asian and Latin American countries and tracked production shifts from other Asian and Latin American countries into China. After consulting with several labor, academic, and policy experts, we decided to focus our media search efforts on the following countries:

Mexico, Costa Rica, Guatemala, Honduras, El Salvador, Dominican Republic, Brazil, Jamaica, Taiwan, Indonesia, Hong Kong,[4] Singapore, Thailand, Cambodia, Vietnam, Burma, India, Malaysia, Korea, Japan, and the Philippines. We felt the Mexican data would be particularly valuable for purposes of comparison, because the post-NAFTA environment might suggest similar trends for China in the aftermath of PNTR and entrance into the WTO.

English-language media searches were conducted for all targeted countries as well as searches in Spanish, Chinese, Korean, Japanese, and Portuguese language media. To make this possible we pulled together a team of bilingual researchers on both campuses. In addition we recruited two Chinese graduate students to work under the supervision of one of our principal investigators who was conducting research in China this spring.[5]

Our media search was primarily based on online media sources focused in four major areas: Lexis-Nexis[6] searches of world-wide English and Spanish language newspapers, magazines, electronic media transcripts, and wire service sources; online searches of English and Spanish language local newspaper web sites; online searches of Japanese, Korean, Chinese, and

[4]For the purposes of media tracking we treated Hong Kong as part of China in our analysis of production shifts out of the U.S. and other countries into China. We did search separately for production shifts from Hong Kong into Mainland China and do record those results in our media-tracking findings. However, although we found many news stories about Hong Kong-based businesses opening up new operations on the mainland, we did not include most of these cases in our production shift database because they were new enterprises established to serve a mainland Chinese market and did not involve any plant closings or job losses in Hong Kong. For the purposes of the macroeconomic analysis we did treat Hong Kong as a separate economic entity.

[5]Early on in the process we discovered that access to many Chinese online media sources had been shut down in early January. Fortunately, one of the researchers on the project spent the last year conducting research in China and was able to recruit and supervise two Chinese graduate students to search both print and online Chinese media sources that are not easily accessible in this country. By the time the project was completed most of the Chinese media sources were back online and the Chinese students were able to complete the Chinese language media searches using online databases.

[6] Lexis-Nexis is a fee-for-service online database of legal, corporate, and news reporting covering more than 29,000 sources including local, regional, and national newspapers from the U.S. and around the globe, newsletters, magazines, trade journals, wire services, broadcast transcripts, corporate profiles, market research reports, country profiles, government and court documents, legislation, and legal journals.

Portuguese media web sites for the major newspapers and news magazines in those countries; and print searches of major Chinese newspapers and magazines that are not available online.[7]

Prior to conducting the searches we completed a variety of test searches that targeted media reporting of production shifts out of the U.S. and into China for the industries and countries we had selected. In reviewing articles we recorded concepts, terms, keywords, synonyms, and phrasing typically used in the articles and selected the terms and concepts most likely to capture the most comprehensive and efficient selection of media stories possible. Our goal in selecting search terms was to avoid both search strategies that failed to capture all the media stories we did need and search strategies that captured numerous extraneous articles that we did not need.[8] For foreign-language searches these search terms were translated into the appropriate words and idiomatic expressions that were most likely to capture similar stories in foreign language media. Slightly different terms were used for searching Chinese media since rather than searching for stories about production shifts and plant shut downs, we were looking for stories about new facilities opening up or existing.[9]

For all cases where we found Chinese media stories about new or expanding production or investment by foreign companies in China, we then conducted an English-language search for

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[7] The Chinese newspaper searches covered more than thirty national and provincial online print and electronic media sources which covered Chinese business news as well as five business search engines (*Yunnan Economic Information Net*, *Beijing Investment Net*, *Sina Net*, *Sohu Net*, and *3721 Net*).

[8] After extensive experimentation with search strategies for keyword searching, connecters, field, or segment searching, proximity, truncation, word arrangement, and phrase searching we determined that the most effective search strategy was paragraph proximity searching using the following search statement: ((plant or factory or facility or operation or manufacturing or unit or production) w/p (close or shift or shut or relocat! or move or transfer!) and China). Depending on the number of articles returned, searches were then limited to specific days, weeks, or months, to narrow the data collected to a more manageable format.

[9] For searches in Chinese language in China we used search terms such as foreign investment (wai shang tou zi), foreign company (wai shang, wai guo gong si, wai qi), investment (tou zi), foreign capital (wai zi), foreign enterprise (wai qi), FDI (wai shang zhi jie tou zi), merge (bing gou, gou bing, jian bing), set up (kai gong/kai ye), and multinational company (kua guo gong si).

media from other countries to see if we could trace the original source of the work that moved into China. Similarly, for all English and other language media stories we found about planned or actual production shifts from the U.S. and other countries into China, we also checked the Chinese-language media for information confirming or expanding on the information found in the original searches.[10]

After conducting their daily searches the researchers then reviewed each of the articles to see, which, if any, included information relevant to the study. These included all stories describing planned or actual cases of production shifts out of the U.S. into China and the other designated Asian and Latin American countries or production shifts out of the other designated countries into China. The researchers then conducted follow-up searches for additional or corroborating information about each of these cases.[11] For all cases where they were able to confirm actual production shifts out of the U.S. and into China for the period of October 1, 2000 to April 30, 2001, the descriptive information about the case was then entered into a Microsoft Access database including the name, city, state, and country, parent company, and parent company country for the company where the work originated; the city, state, and country where

[10] One difficulty with crosschecking the English language and Chinese language searches was the translation of the companies' names. With the exception of world-famous multinational companies, Chinese language media rarely reported the formal company name, instead just listing the Chinese characters that do not necessarily follow the correct foreign-language pronunciation of the company name. Thus, unless the English language media listed the Chinese language name or the Chinese language media listed the actual company name, we had difficulty tracking the new production site in the Chinese media. Similar problems were found with the Japanese and Korean language searching. However, we did not find this problem with the Spanish or Portuguese language searches where, in most cases, the company names were listed in their original spelling.

[11] In confirming production shifts and number of jobs lost, federal government databases for WARN Act and Trade Adjustment Assistance filings were used to supplement online media sources. Data on unionization was compiled from the AFL-CIO UNICORE and contract databases. Overall we were able to find confirming information for 21 percent of the moves from the U.S. to China, 37 percent of the moves to other Asian countries, 20 percent of the moves to Mexico and 10 percent of the moves to other Latin American countries using TAA data. Using NAFTA-TAA data we were able to confirm 11 percent of the moves to China, 21 percent of the moves to other Asian countries, 30 percent of the moves to Mexico, and 40 percent of the moves to other Latin American countries.

the production was shifted to; the industry, product, and date of relocation; the number of employees involved; the ownership structure, financial condition, and other sites and locations of the company; the full citations and web-links for all the information sources collected; and a one paragraph abstract describing what happened. Similar data were also collected for all cases where a production shift was announced and/or threatened but the actual shift could not be confirmed. Forms for both the confirmed shifts and threatened shifts were then compiled in one combined database file that is searchable by country, industry, product, and company name.

Table 1. Production shifts from the U.S. to China, Mexico, and other Asian and Latin American Countries: October 1, 2000 – April 30, 2001

	Number of announced production shifts	Percent of all production shifts from the U.S.	Percent announced but not confirmed
China	84	29%	58%
Other Asian countries	40	14%	40%
India	2		
Indonesia	6		
Japan	3		
Korea	3		
Malaysia	13		
Philippines	2		
Singapore	5		
Taiwan	1		
Thailand	5		
Mexico	148	52%	64%
Other Latin American countries	15	5%	33%
Brazil	3		
Costa Rica	1		
Dominican Republic	5		
El Salvador	1		
Guatemala	2		
Honduras	3		
Total of sample	287	100%	57%

As you can see from Table 1, for the seven months of media data collection we found a total of 287 cases of production shifts out of the U.S. into China, Mexico, and other Latin

American and Asian countries, including 84 production shifts from the U.S. to China and 148 from the U.S. to Mexico, 40 from the U.S. to other Asian countries (including India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand), and 15 from the U.S. to other Latin American countries (including the Dominican Republic, Brazil, Honduras, Guatemala, Costa Rica, and El Salvador). We did not find any production shifts from the U.S. to Jamaica, Haiti, Vietnam, Cambodia, or Burma (Myanmar) during the time period studied.[12]

Table 2: Media-recorded production shifts from Asian countries and Mexico to China: October 1, 2000 - April 30, 2001

	Number of announced production shifts	Percent of all production shifts from the U.S.	Percent announced but not confirmed
Taiwan	60	33%	80%
Korea	20	11%	50%
Japan	69	38%	73%
Other Asian countries	26	14%	73%
Hong Kong	4		
India	1		
Indonesia	2		
Malaysia	6		
Philippines	8		
Singapore	5		
Mexico	7	4%	43%
Other Latin America (Brazil)	1	1%	100%
Total of sample	183	100%	68%

During that same time period we found a total of 183 production shifts from Mexico, Japan, Korea, Taiwan and other Asian countries into China (Table 2). There were 69 cases of production shifts from Japan to China, 60 from Taiwan to China, 20 from Korea to China, 7 from

[12] Originally we had also hoped to search for data on production shifts to India and Pakistan, but were unable to complete those searches with the limited resources and the short time period allotted for the pilot study. Thus the only cases we did find for India were discovered through searches of production shifts to other countries in our database. We also did not complete in-depth searches of Spanish and Portuguese language media sources and so believe that our findings under represent production shifts from the U.S. to Latin America and from Latin America to China.

Mexico into China, 1 from Brazil into China, and 26 from other Asian countries into China (including the Philippines, Malaysia, Singapore, Hong Kong, Indonesia, and India.)

With the exception of Brazil, we did not find any production shifts from Latin American or Caribbean countries to China, nor did we find any production shifts from Vietnam, Cambodia, or Burma into China, during the time period studied. For all the production shifts from the U.S. to China we were able to confirm 42 percent of the production shifts announced in the media, leaving 58 percent that were announced but either could not be confirmed or had not yet occurred by the April 30, 2000 media data collection deadline. This compares to production shifts from the U.S. to other Asian countries where we were able to confirm 60 percent of the announced cases; Mexico, where we were able to confirm only 36 percent of the announced cases; and other Latin American countries, where we were able to confirm 67 percent of the announced cases.

It was even more difficult to confirm production shifts from Asian countries into China. This is particularly true of the moves from Taiwan or Japan, where the movement of production to China was announced in the media for those countries but, in 80 percent of the Taiwanese cases and 73 percent of the Japanese cases, there was no follow-up story in the Chinese media or in the media for the country of origin confirming if and when the production shift actually occurred.

The high percentage of threatened production shifts announced in the media that we were unable to confirm appears to be a consequence of several trends. The first is that it appears many media sources report the planned relocation but never do a follow-up story when the actual shift takes place. This is especially true of the national and regional papers that were available to us through Lexis-Nexis and other online media sources. Another problem with confirming

production shifts is that when a plant opens or expands in the destination country, the local media in that country rarely reports on the company or country where the work originated. This was particularly true of both China and Mexico, where new plant openings and foreign direct investment were actively celebrated in the media, but we never found any mention that any of the new production in those countries had originated somewhere else.

The second possible reason for the lack of confirmation is that many employers may use the threat of production shifts both to impress investors and shareholders and to coerce workers to make concessions on wages, benefits, or work rules; or to refrain from voting for a union; or to coerce municipalities to make concessions on taxes, regulations, or zoning requirements. Although in a short-term study such as this it is difficult to estimate just how many of the announced production shifts will actually occur, it does appear that some portion of these announcements were never meant to be more than threats and bargaining leverage. However, we would estimate that that portion is relatively small (less than 25 percent) since, over time, if too many companies "cried wolf" too often, there would be a backlash against both the media and the companies from workers, elected officials, and the general public.

Validity and Reliability of the Media-tracking Findings

As the above discussion reveals, enormous challenges are involved in developing a reliable and comprehensive media-tracking system. Although we have made significant progress from just a little more than a decade ago when media searches involved endless hours hunched over microfiche readers and newspaper vertical files, online media searching remains a difficult and time-consuming endeavor. Using the search keywords and criteria we established, our researchers averaged as many as 500 articles per each day of news for each country, of which

five or fewer were actually relevant to the subjects they were searching for. This means that for every confirmed case they found, the researchers had to scan through several hundred articles. In addition to the difficulties in confirming cases, we also had to bear in mind at all times the other limitations of our searches and our sources, namely that (1) only a limited, albeit growing, selection of media sources has searchable online archives; (2) local news media are the least likely to have online media archives but the most likely to report plant closings and production shifts; (3) not all production shifts are covered in the media and we have no reliable way of determining how many are not covered; (4) media reports range greatly in the reliability, veracity, and comprehensiveness of the information reported; and (5) it would take staff and financial resources well beyond the scope of this research endeavor to thoroughly search all available online media data, much of which is available only from expensive fee-for-service and limited-access databases.

Based on these limitations, it is our assumption that, if anything, the media-tracking data underestimate rather than overestimate the total number of production shifts out of the U.S. into China and other countries, and from other countries into China. Although, as we discuss in the section above, we believe that some portion of the unconfirmed production shifts were simply threats, we believe that there are a much larger number of production shifts, which we estimate to be more than half of the total production shifts that occurred, that were missed by our searches because they were not covered in the major online media sources on which we relied. Still, the data that we have been able to collect provide an excellent cross section of the kinds of industries, companies, occupations, regions, and communities that are affected by production shifts out of the U.S. to China and other countries and, when integrated with the macro data

findings, provide valuable insight into the impact that U.S.-China trade and investment relationships have had on workers, wages, and employment.

Research Methods in the Analysis of Macroeconomic Data on Trade and Investment

The goal of the macroeconomic analysis presented in this report was to provide an overview of the U.S.-China trade and investment relationship in recent years and to carry out some preliminary analysis regarding the impact of this relationship on the U.S. economy, particularly U.S. employment. Compiling international trade and investment data from a wide variety of national and international sources produced the description of the U.S.-China economic relationship. Sources of economic data included the following: the U.S. Census Bureau; the U.S. Bureau of Economic Analysis; the U.S. Bureau of Labor Statistics; the U.S. International Trade Commission; the U.S. Customs Service; the China National Bureau of Statistics; the International Monetary Fund; the International Labour Organization; the World Bank; the World Trade Organization; the Organization for Economic Cooperation and Development (OECD); and the United Nations Conference on Trade and Development (UNCTAD). In addition, we drew upon data analysis and surveys presented in a number of scholarly articles to add to the description of U.S.-China trade and investment relations. These studies are cited in the text.

The preliminary analyses we present utilize data found in several of the sources noted above and make use of factor content analysis for estimating employment effects from U.S.-China trade and econometric statistical analysis to estimate the effects of U.S. direct investment in China on U.S-China trade flows. The technical details of these analyses are described in appendices to the report. We also review economic theory regarding the effects of trade on the

domestic economy and discuss a number of past studies focused on the impact of trade on U.S. employment and wages.

PART III: FINDINGS FROM THE MEDIA-TRACKING DATA

Media-tracking Findings on Shifting Production from the U.S. to China

The most striking finding from the media-tracking data is the relatively high incidence of production shifts out of the U.S. to China just shortly after the passage of PNTR and before China has even entered into the WTO. Not only did we find media documentation that between October 2000 and April 2001 more than eighty companies announced their intention to move their production to China, the number of production shifts increased each month of our media searching. While in October and November, just after PNTR was passed, we found, on average, only two production shifts to China each month, by December and January that number had increased to six, by February to eight, by March to eleven, and by April to nineteen.

Production shifts also increased to Mexico and other countries each month, but not at the same pace, starting at four to six production shifts a month in the fall of 2000, averaging between nine and twelve cases between January and March 2001, and increasing to sixteen cases in April 2001.

For many of the U.S. production shifts in our media-tracking database, production shifts were not limited to one country. In many cases U.S. companies would shift different parts of their operations to different countries, all at the same time, for a variety of reasons. Both Mexico and China provide labor cost savings, and both are working rapidly to expand the technical infrastructure to attract higher-end production. China offers special advantages because of its

proximity to the burgeoning Asian markets, while Mexico's land border with the U.S. streamlines the supply chain process.

Lexmark International, the world's second largest computer printer manufacturer, is one example of a U.S.-based company that decided to shift production simultaneously to both Mexico and China. Lexmark's headquarters and main manufacturing facility are based in Lexington, Kentucky. The company also has manufacturing centers in Boulder, Colorado; Orleans, France; and Sydney, Australia; and employs about 11,000 workers worldwide (Lexmark 2001).

In October 2000, Lexmark announced it would lay off about 10 percent of its workforce by the end of the year. The lay-offs were part of a company-wide restructuring program, relocating some laser printer manufacturing to northern Mexico and southern China (*Chicago Sun Times* 2000).

Lexmark had a poor financial year in 2000, and by October, shares of Lexmark were down 67 percent from their 52-week high of $138.875. However, according to Lexmark CEO Paul Curlander, the lay-offs and production shift were "not a reaction to our short-term issues, but rather a part of our ongoing process to drive down product cost" (Stamper 2000: 1).

Lexmark expects the lay-offs to result in a savings of $100 million annually, although the restructuring was estimated to cost between $35 and $45 million in the fourth quarter 2000. According to the company, about $25 million of the cost goes to "people-related expenses." Just the announcement itself resulted in a jump of 18 percent in stock prices (Stamper 2000:1). This suggests yet another incentive for employers to shift production out of the U.S. -- since just the threat of moving can result in increased shareholder investment in the company because they see production shifts as an effective way to improve the return on their own investments. Cases such

as Lexmark, where the stock price increased just with the announcement of the plant closing, suggest that some companies may try to manipulate stock prices by making threats to move when they have no intention of actually moving their operations. However, this strategy also risks a backlash from shareholders once it becomes apparent that it was only a manipulative device by the company to enhance stock prices rather than a serious cost-cutting measure.

The Lexmark layoffs will affect about 900 workers, including 600 manufacturing workers at the Lexington, Kentucky facility. The company announced that this move would eliminate its last manufacturing facilities in Kentucky, but that the company expected to replace its workforce in the next several years with research and development. Workers at the new plants in both Mexico and China will report to a third-party contractor, not Lexmark (Stamper 2000).

Estimated Number of Jobs Lost

As would be expected, given the much greater logistical challenges in relocating production to the other side of the world compared to just south of the border and the fact that NAFTA has been in effect for more than seven years, the total number of production shifts to Mexico over the seventh month period (148), was much larger than the total number of production shifts we found for China (84). There were 40 cases of production shifts to all other Asian countries combined and only 15 cases of production shifts to other Latin American and Caribbean countries.

However, because, on average, the number of workers affected by the production shifts was much larger for the China cases than for the Mexican cases, the total number of jobs lost through production shifts to China during the last seven months was as high as 34,900, compared

to 29,267 jobs lost to Mexico; 9,061 jobs lost to other Asian countries; and only 708 jobs lost to other Latin American countries (Figure 1). The average number of jobs lost per production shift in shifts to China was 537, compared to 503 jobs lost to other Asian countries; 340 to Mexico; and 354 to other Latin American countries (Figure 2).

Figure 1: Estimated total number of jobs lost: October 1, 2000-April, 1 2001

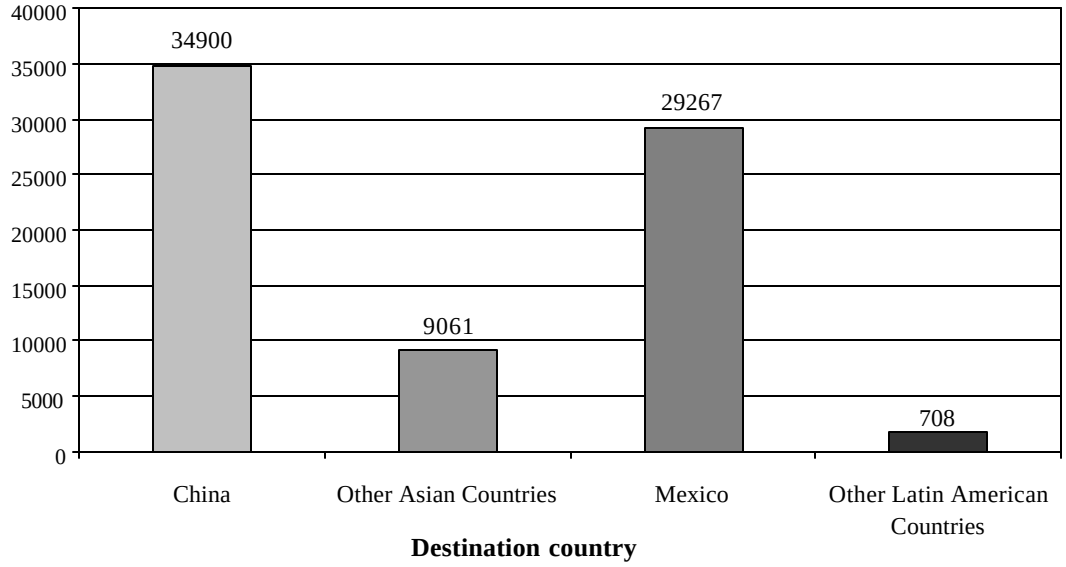
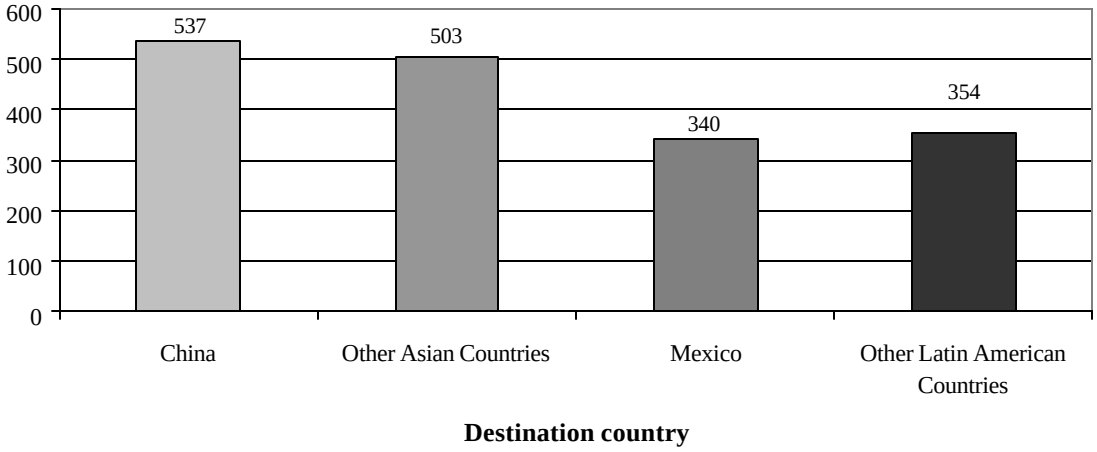


Figure 2: Average number of jobs lost per production relocation



As we will describe later in the discussion of the macro data findings, estimates of the employment effects of trade and investment policies with China range from no employment effect to as high as 770,000 jobs lost since the early 1990s (see page 75). A similar debate has occurred regarding Mexico, where Economic Policy Institute (EPI) economist Robert Scott estimates the total number of jobs lost to Mexico in the seven years since NAFTA has passed to total more than 700,000 (Scott 2001). Our media-tracking data estimate that at least 60,000 jobs are lost each year to Mexico and another 70,000 jobs are lost each year to China due to shifts in production from the U.S. to those countries. Since we believe that our media-tracking captures fewer than half of all production shifts and jobs lost from production shifts, we believe the actual numbers of production jobs lost to both Mexico and China must average close to 100,000 each year even if you take into consideration those announced production shifts that were only threats. Thus our micro data findings provide strong support for Scott's higher estimates of the wage and employment effects trade and investment with both China and Mexico.[13]

Industrial Sector

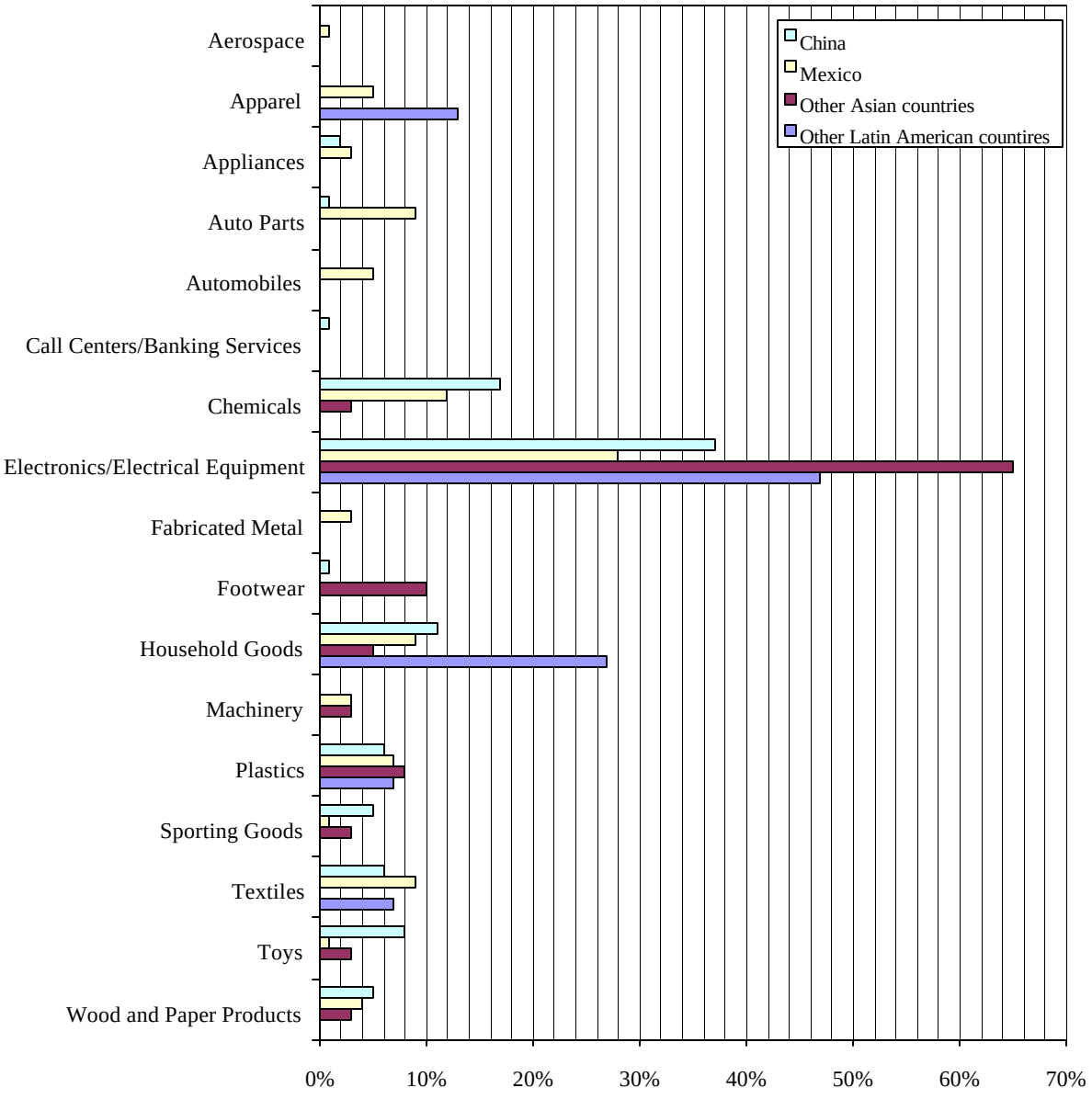
Figure 3 describes the industries and economic sectors where production shifts out of the U.S. to China, Mexico, and other Asian and Latin American countries are concentrated.[14] Coinciding with the macroeconomic data discussed in Part IV of this report, production shifts to China are highly concentrated in electronics and electrical equipment (37 percent), chemicals and petroleum products (17 percent), household goods (11 percent), toys (8 percent), textiles (6

[13] Our job loss estimates from the media-tracking data only concern jobs lost through production shifts out of the U.S.. This contrasts with Scott's estimates of job losses due to China trade which include net jobs lost due to trade through lay-offs, attrition, or plant closings.

[14] A full table including the actual percentages of production shifts for each industry is included in Appendix 1, Table A1a.

percent), plastics (6 percent), sporting goods (5 percent), and wood and paper products (5 percent).

Figure 3: Distribution of production shifts out of the U.S. by industrial sector



This contrasts with other Asian countries where 65 percent of production shifts out of the U.S. were in electronics and electrical equipment and 10 percent were in footwear, and with

Mexico where 6 percent of production shifts were in apparel, 4 percent in automobile production, 10 percent in auto parts, 3 percent in metal fabrication, and 3 percent in machinery. None of the production shifts from the U.S. into China were in apparel, machinery, metal fabrication, or automobiles and only 1 percent were in footwear or auto parts.

These industry data suggest that recent production shifts to China are not limited to low-wage production jobs on the margins of the U.S. economy. Instead, they cross a wide range of occupations at some of the nation's preeminent manufacturers including bicycles produced by Raleigh, Hasbro and Mattel toys, polyester and nylon production by E. I. Du Pont de Nemours, Flextronics circuit boards, Lionel model trains, Johnson Electric Holdings auto parts, DVD components for Pioneer Video, Samsonite luggage, Matsushita air conditioner compressors and microwaves, Motorola semiconductors, wrenches and halo lighting fixtures by Cooper Tools, Ametek generators, and Universal Furniture bedroom furniture sets.

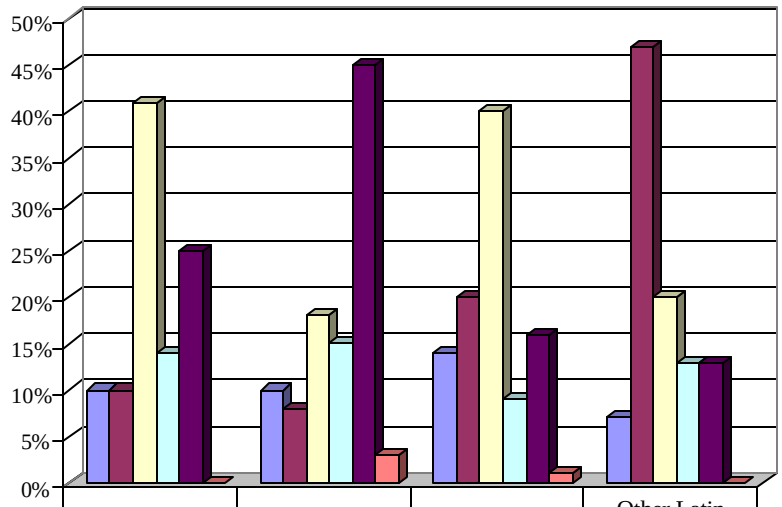
Production shifts to China have even hit workers in the tool-and-die industry and engineers in research and development. Jim Martin, a reporter from the *Erie New Times* describes what one Erie-based tool-and-die company executive discovered on a tour of China tool and die plants:

> Kurt Duska knew what he'd find on a recent tour of tool-and-die plants in China --- old equipment, dirt floors and poorly trained toolmakers. What he found instead was a lesson in why tool companies in Erie and Crawford counties say they feel threatened by China and its growing tooling industry. 'I saw facilities there that were better equipped than my own,' said Duska, president of Erie Engineering Plastics. That comes as sobering news here in one of the nation's tool-making hotbeds, where there's mounting evidence that the Chinese are winning a growing share of the work that has traditionally provided this region with many of its best-paying industrial jobs (Martin 2001).

U.S. Region of Origin

The data on production shifts out of the U.S. also reveal a great deal of variation across regions and states. As shown in Figure 4, production shifts to China are most likely to originate in the Southeast (41 percent), West Coast and Mountain States (25 percent) and Southwest (14 percent).

Figure 4: Regional production moves



	China	Other Asian	Mexico	Other Latin American
Northeast	10%	10%	14%	7%
Midwest	10%	8%	20%	47%
Southeast	41%	18%	40%	20%
Southwest	14%	15%	9%	13%
West Coast and Mountain States	25%	45%	16%	13%
Territories	0%	3%	1%	0%

However, even within regions, the production shifts are concentrated in just a handful of states. California was the hardest hit, accounting for 14 percent of all production shifts to China and more than half of all production shifts from the West Coast/Mountain states to China. The other top states from the West Coast/Mountain states include Oregon (5 percent of all production

shifts to China), and Washington and Colorado (both 2 percent). One of the companies moving out of California was the Los Angeles-based sporting goods producer, K2, Inc. In February 2001, K2 announced it was closing its Corona, California snowboard manufacturing facility and moving to China in an effort to cut production costs. Design and engineering personnel from the California plant were to be moved to the company's facility in the state of Washington, while about fifty production workers at the Corona plant would lose their jobs (*The Press Enterprise*, 2001).

As we found with many of the companies moving to China, the driving force behind the K2 move was more a quest for ever-increasing profits than a matter of declining sales or profits here in the U.S. K2's net sales for the quarter ending March 31, 2001 had fallen to $173.2 million from $185.0 million in the same period last year. However, gross profit as a percentage of sales was comparable with the prior year's quarter at 29.3 per cent (*Asia Pulse* 2001a). According to Richard M. Rodstein, K2's president and chief executive officer, K2's "winter sports businesses continue to gain in momentum resulting in double digit percentage increases in preseason orders for both our snowboard business and our K2 skis" (*Asia Pulse* 2001a). Despite its desire to cut costs, the company has managed to continually generate significant cash flow. The company hopes to further boost margins and profitability by increasing production in China to the point where 75 percent of all K2 winter sports products will be manufactured in Chinese production sites (*Asia Pulse* 2001a).

North Carolina is another state that has been particularly hard it by production shifts to China, accounting for 11 percent of all production shifts to China, and is the source of more than a quarter of all production shifts from the Southeast. In this region, North Carolina is followed

by South Carolina (7 percent of all production shifts to China), Florida (5 percent), and Georgia, Kentucky, and Virginia (all 4 percent).

One of the most reported cases of production shifts out of North Carolina and the Southeast region involved Universal Furniture. In January 2001 Universal Furniture started laying off 360 employees as it prepared to shut down its Marion, North Carolina operation where bedroom furniture is built. Marion has about 5,000 residents. The area, in Western North Carolina, has been hit by a series of plant closures, including a spate of textile plant closings in the early 1990s.

Universal, the world's largest producer of dining room furniture is a subsidiary of LifeStyle Furnishings International. The company, which operates nineteen manufacturing facilities in the United States, Sweden and China, is working to consolidate operations and shift more production to China. President and CEO Harvey Dondero explains, "This consolidation continues our drive to achieve operational efficiencies through advanced manufacturing processes and lean enterprise techniques" (*HFN* 2000: 14).

The region around Marion is known as one of the premier furniture production areas in the country. Marlon Pace, 65, has worked in furniture manufacturing for sixteen years, but notes "There's a lot of people, they've been born and raised here and that's all they know is furniture factories" (Cannon 2001: A1). Town residents feel that the furniture plant closings will be similar to what hit the town in the 1990s, when the textile plants closed and more than 1,000 people were out of work. Pace told reporters that if the same level of closings happens again, "there just ain't no jobs here in McDowell County for all the people" (Cannon 2001: A1).

Production workers at the plant earned an average of about $10 per hour. Universal announced that it would provide severance packages and hold a job fair for the employees (Clark

2000). Patin Howard, Jr., manager of the Employment Security Commission office in Marion, expressed concern about the local economy after spending several days at the Universal plant, signing up workers for unemployment benefits (Cannon 2001: A1).

Following California and North Carolina, Texas is the number three state in the country for production shifts to China, accounting for 10 percent of all production shifts to China and 83 percent of production shifts from the Southwest. Arizona is the only other state in the Southwest that has production shifts to China (2 percent). In the rest of the country the only states with a significant number production shifts to China include Ohio (6 percent) and Illinois (4 percent).

Our results on regional job shifts correlate with those found by Scott in his analysis of the possible employment effects of PNTR on states (2000b). Scott estimates that California will suffer the greatest absolute loss over the next decade, with a decrease of about 85,000 jobs. According to Scott, other states expected to suffer more than 40,000 jobs lost in this period include Texas, Pennsylvania, New York, and North Carolina.

In contrast with production shifts to China, we find that production shifts to other Asian countries are much more likely to originate in West Coast/Mountain states (45 percent), primarily California, Oregon, and Colorado, while shifts to Mexico and Latin America have a higher percentage of production shifts from the Midwest (20 percent for Mexico and 47 percent for other Latin American countries). Overall, production shifts to Mexico are more scattered across states and regions including North Carolina (13 percent), Ohio (8 percent), Pennsylvania (7 percent), Texas (7 percent), California (5 percent), South Carolina (5 percent), Illinois (5 percent), and Georgia, Wisconsin, Tennessee, and Indiana (all 4 percent).

Although some of this variation across states and regions may be explained by proximity to markets – namely that West Coast states make a more natural base for companies moving to

Asia – it appears that it is partially a function of the industries involved. For example, because the automobile and auto parts industries have a large number of plants in the Midwest and these are both industries that are more likely to move to Mexico than to China, there are more production shifts to Mexico from this region than to China. Similarly, a great deal of electronics production has been concentrated in the West Coast, particularly California, and it is these industries that have been most likely to ship production to China and other Asian countries.

Company Characteristics and Structure

The U.S. companies that are shutting down and moving to China and other countries are relatively large, well-established companies, primarily subsidiaries of publicly-held, U.S.-based multinationals, including such familiar names as Mattel, International Paper, General Electric, Motorola, and Rubbermaid. As shown in Table 3, 86 percent of the companies moving from the U.S. to China are publicly-held companies trading shares on the U.S. stock exchange, while only 13 percent are privately held. These data compare to companies moving to Mexico where 18 percent are privately held.

Eighty-five percent of companies moving to China are U.S.-based multinationals and 16 percent are foreign-based multinationals, with primarily Asian (11 percent) and European (4 percent) ownership. In contrast, more than a third of the companies moving to other Asian countries are foreign-based multinationals, including 18 percent with Asian ownership and 16 percent with European ownership. Eighteen percent of the parent companies where production was shifted from the U.S. to Mexico are foreign-based multinationals, primarily European.

Table 3: Company structure for production moves out of U.S.: October 1, 2000-April 30, 2001

	Percent of moves to China	Percent of moves to Mexico	Percent of moves to other Asian countries
Publicly held	86%	82%	88%
Privately held	14%	18%	13%
U.S.-based multinational	85%	82%	68%
Foreign-based multinational	16%	18%	33%
Asia	11%	3%	18%
Europe	4%	12%	15%
Australia/ Pacific Islands	1%	2%	0%

Japan is by far the predominant country for Asian-based foreign-owned multinationals, representing more than two-thirds of all Asian-owned multinationals that shifted production out of the U.S. to China and other countries. Other Asian countries where multinationals are based include Hong Kong, Malaysia, and Singapore. The predominant European countries where the multinationals that moved production from the U.S. to China, Mexico and other countries are based include Sweden, the Netherlands, Germany, Finland, and the United Kingdom.

Table 4: Company characteristics for production moves out of U.S.: October 1, 2000-April 30, 2001

	Moves to China	Moves to Mexico	Moves to Other Asian countries
Employment characteristics			
Total number of parent company employees	57,918	55,667	63,469
Number of U.S.-based employees	10,039	9,923	3,568
Financial characteristics			
Annual revenue (USD millions)	$456,619.19	$10,301.23	$16,578.82
Net income (USD millions)	$4,775.33	$3,408,06	$845.77

The companies involved in these production shifts from the U.S. to China and other countries are large and profitable worldwide corporations (Table 4). The total number of parent-company employees for companies moving to China and Mexico averages around 58,000 and the average number of U.S.-based employees averages around 10,000. For companies moving to other Asian countries the number of parent company employees averages more than 67,000 while the number of U.S.-based employees averages 4,000.[15] Annual revenue for companies moving to China averages more than $450 billion while net income averages $4.8 billion. These data compare to companies moving to other Asian countries, where revenues averaged $17 billion and net income averaged $890 million and Mexico, where revenue averaged $11 billion and net income averaged 3.4 billion.

The great majority of companies shifting production out of the U.S. were long-standing organizations that had been in operation for nearly half a century.

Table 5: Historical data of companies moving production out of U.S.: October 1, 2000-April 30, 2001

Proportion of companies with the following characteristics:	**Moves to China**	**Moves to Mexico**	**Moves to Other Asian countries**
Years in operation			
Less than 10	19%	16%	15%
Between 10 and 20	19%	8%	54%
Between 20 and 50	15%	20%	15%
50 or more	46%	57%	15%
Average number of years in operation	43.27	64.94	26.62
Years under current ownership			
Less than 10	33%	44%	55%
Between 10 and 20	29%	11%	36%
Between 20 and 50	5%	22%	0%
50 or more	33%	22%	9%
Average years under current ownership	31.48	24.11	15.36

[15] We were only able to find employment information for a handful of the companies moving to other Latin American countries, too few to come up with any reliable estimates of average company size.

As shown in Table 5, 46 percent of the companies that shifted production to China and 57 percent of the companies shifting production to Mexico had been in operation for at least fifty years, while only 19 percent of companies moving to China and 16 percent of companies moving to Mexico had been in operation for fewer than ten years. Not surprisingly, companies moving to other Asian countries, which included a high number of computer and consumer electronics producers, tended to have been in operation for a much shorter period, with only 15 percent having been in operation at least fifty years and nearly 70 percent in operation for fewer than twenty years. Yet, despite the long years of operation, many of the companies shifting production out of the U.S. have had ownership changes in the last ten years, including one-third of companies shifting to China, 55 percent of companies shifting to other countries, and 44 percent of companies shifting to Mexico. Still, one third of the companies moving to China and 22 percent of the companies moving to Mexico had been under the same ownership for at least fifty years.

One example of a long-standing company involves Zebco, a sports fishing-equipment company that moved to China just this year. The fifty-one year old Tulsa-based Zebco, which was the last major fishing tackle manufacturer based in the U.S., was formerly a subsidiary of Brunswick Corporation based in Chicago. In October, Zebco executives announced that Zebco and three other Brunswick Corporation outdoor equipment brands were being bought out by Los Angeles-based K2 for $200 million in cash, stock, and assumed debt. The 240 workers at Zebco were told that they could continue working through the end of December 2000 (Stewart 2000).

For Brunswick, the Zebco deal completed a series of divestitures in its sleeping bag, tents, and camping accessories production lines, to be followed by the sale of its bicycle and European fishing equipment production lines later in the year. According to Brunswick

Chairman and CEO George W. Buckley, "Divesting in our outdoor recreation businesses will enable us to focus on our core operations and strengths in marine engines, boating, exercise equipment, bowling, and billiards" (Stewart 2000).

The workers, 90 percent of whom are women, are represented by Transport Workers Union Local 514. According to the union, Zebco workers averaged more than ten years seniority at the plant and the vast majority were in pay grades "that topped out at $8.94 an hour." Workers who agreed to leave their jobs prior to the December deadline were offered $350 severance pay for each year of service, along with two months of company-paid health insurance (Stewart 2000).

But the severance package did little to diffuse the hurt and anger felt by Zebco employees. Kelly Kurt from the *Chicago Tribune* describes one worker's reaction:

> Tears streamed down Shirley Schell's cheeks as she described putting two children through college on the paychecks she earned at the plant, where researchers tested new products in a reflecting pool out front.
>
> 'It's not only a sad day for me,' the 62-year-old said as she pieced together some of the company's last U.S. reels last month. 'It's a sad day for this nation. You lose a 50-year-old company, an American-made product--everybody has lost' (Kurt 2001: 7).

Some of the workers pushed for a national boycott of Brunswick products. According to *Tribune* reporter Kurt, their call resonated with some Zebco customers. As one local fisherman told Kurt "It's pretty sad. This is probably the great American reel. . . . It's almost like Chevrolets and baseball and apple pie." (Kurt 2001: 7)

Markets

It is also clear from the company data that the majority of the U.S.-based multinational corporations that are shifting production to China are not simply targeting a new Chinese market. As we will describe later in this report in the discussion of the macro data, although a significant percentage of all U.S.-based MNC sales were directed at a Chinese market, the percentages dropped much lower for the kinds of manufacturing industries that constitute the majority of U.S.-based companies moving operations from the U.S. to China. Companies such as La Crosse Footwear (winter boots), Lexmark (printers), Motorola (cell phones), Rubbermaid (cookware and storage products), Raleigh (bicycles), Cooper Tools (wrenches), Mattel Murray (Barbie playhouses), and Samsonite (luggage) may have moved their production to China but still intend to serve a U.S. and global market.

Others, such as Japanese-based Matsushita, moved production out of the U.S. to China specifically to capitalize on an export market. In February, Matsushita announced plans to close its Mooresville, North Carolina production facility and move production to both China and Malaysia. Approximately 530 jobs will be lost (Firestone 2001).

Matsushita employs more than 25,000 people in North America (Panasonic 2001). The U.S. subsidiary posted sales of $98.8 million and gross income of $0.9 million (*AFX European Focus* 2001). The company announced last year that it is streamlining its operations around the world (*Channel NewsAsia*, 2001). The shutdown of the North Carolina plant and the movement of production to Malaysia and China was part of this new streamlining operation.

According to *Wall Street Journal* reporter Masayoshi Kanabayashi, "Exports from China totaled $746 million, or one-third of Matsushita's total sales in China last year, and contributed greatly to the improvement in earnings." Matsushita managing director Yuiko Shotoku told

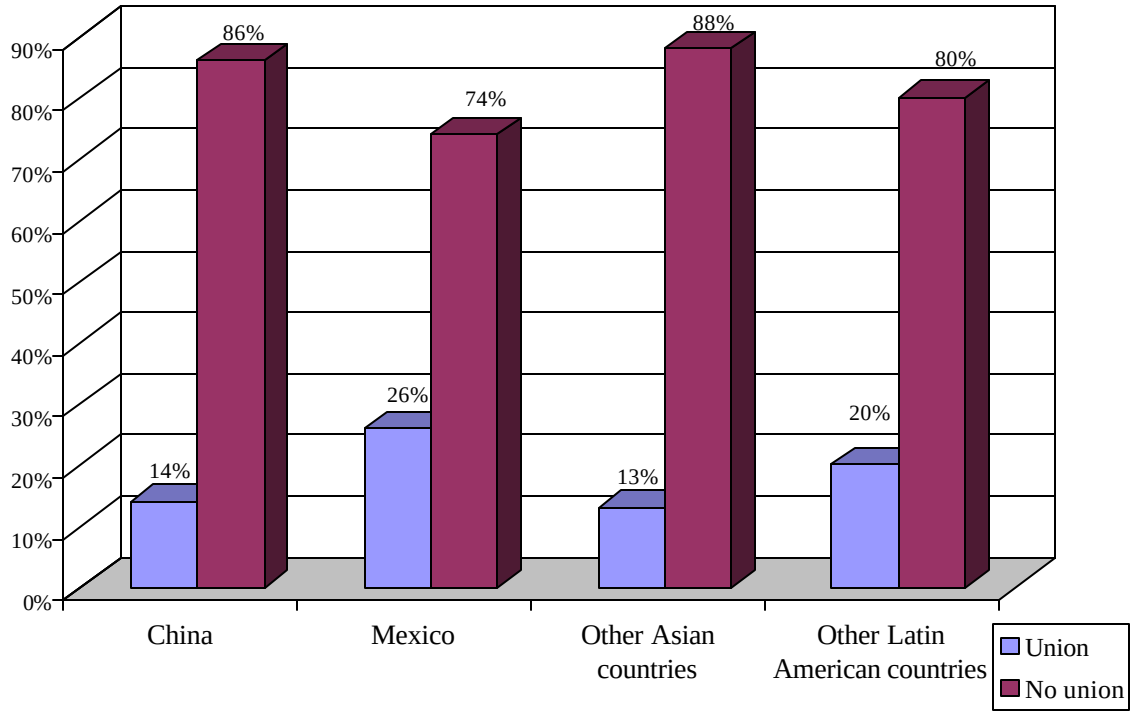
Kanabayashi "without exports, it would have been difficult to post that profit" (Kanabayashi 2000; A29).

Union status

The media-tracking data reveal significant differences in union membership between companies shifting production from the U.S. to China and other Asian countries and those shifting production to Mexico. According to 2000 Bureau of Labor Statistics data, today 14.8 percent of U.S. manufacturing workers are union members (BLS 2001). However, there is great variation across manufacturing industries with density much higher in heavy industries such as auto, aerospace, and paper, and much lower in light-manufacturing industries such as electronics and household goods.

As we can see in Figure 5, 14 percent of all companies shifting from the U. S. to China are unionized, compared to 13 percent of companies moving to other Asian countries, 26 percent of companies moving to Mexico, and 20 percent of companies moving to other Latin American countries. When we look at actual jobs lost, the union differences between shifts to China and Mexico deepen significantly. During the seven months of our media-tracking study we found a total of 4,909 U.S. union jobs were lost due to production shifts to China, which represents 14 percent of all jobs lost to China during that period. During the same seven-month period unions lost a total of 13,560 jobs through production shifts to Mexico, which represents 46 percent of all jobs lost through production shifts to Mexico during that period.

Figure 5: Union status of production moves out of U.S.



These findings are in keeping with earlier research conducted by Bronfenbrenner on the impact of capital mobility and trade policy on union organizing and first contract campaigns (Bronfenbrenner 1997; 2000; 2001). This research found that prior to the passage of NAFTA employers threatened to close the facility in 29 percent of all NLRB organizing campaigns and followed through on the threat and closed the plant in 5 percent of the campaigns where the union won the election (Bronfenbrenner 1997). In 1993-1995, right after NAFTA went into effect, the threat rate during organizing campaigns increased to 50 percent for all employers and 62 percent for employers in mobile industries and the actual plant-closing rate increased to 15 percent (Bronfenbrenner 1997). Five years later, in 1998-1999, the threat rate had increased to 70 percent in manufacturing and other more mobile industries, while the actual plant closing rate dropped to 12 percent, in part because so few elections were won in mobile industries (Bronfenbrenner 2000; 2001). Bronfenbrenner's research concludes that international trade and

investment policies, such as NAFTA, "combined with ineffective labor laws, have created a climate that has emboldened employers to threaten to close, or actually close their plants to avoid unionization" (2000: vii).

The smaller number of union jobs lost to China reflects the fact that companies moving to China are concentrated in industries with lower union density, such as electronics. However, Bronfenbrenner's findings on the impact of NAFTA suggest that all this may change once China enters the WTO and, as they did with NAFTA, employers will look to China trade policy as an opportunity to weaken or eliminate unions where they do exist and prevent unionization where it has not yet taken hold.

One example of this trend involves California Cedar Products, which announced in January 20, 2001 that it would be shifting most of its pencil-slat production to Tianjin, China, over the next 18 months, forcing most of its 325 unionized employees to lose their jobs. The company, which also manufactures Duraflame fireplace logs, has been operating out of its Stockton, California plant for more than sixty years. According to Lee Thomas, California Cedar's Director of Human Resources, the company has "a loyal, high quality workforce with long tenure," most of whom have been working at the company for most of their working lives (California Cedar 2001: 1).

While starting workers average $8.03 an hour, the top of the scale goes as high as $20.15 an hour. Teamsters Local 439, the union representing the workers, offered pay cuts averaging $1.00 an hour to try to persuade the company to keep the pencil-slat operation in Stockton. However, that wasn't enough for the company officials, who argued they needed as much as $6.5 million in labor cost cuts if they were going to remain in Stockton. Company president Charles Berolzheimer told the workers that the company could not remain in the U.S. because "a typical

Chinese laborer, with full benefits, earns the equivalent of $60 to $80 a month," which according to Berolzheimer would make labor costs fifty to eighty times lower than they were in the Stockton plant (Spence 2001).

The company already owns the plant in Tianjin where the production is moving. It has been used to produce window blinds but that production will stop and the Chinese plant will be refitted with the new equipment necessary to produce pencil-slats, including some equipment that will be moved from the Stockton plant (Spence 2001).

The Impact of Production Shifts to China on Workers and Communities in the U.S.

The articles on production shifts that we have collected through the media-tracking database tell a story that is much more complex than the individual jobs lost or plants closed. Each plant that shuts down and every production line that is eliminated has a ripple effect that impacts the entire community. In some cases the media stories tell little more than the name of the company, the number of jobs being lost, and where the company is moving. But more often, particularly in local and regional media, the reporters interview workers, employers, public officials, and community residents who were personally affected by the production shifts, and so can provide additional insight into just how China trade and investment and the production shifts it generates impacts on U.S. workers, their families, and their communities.

In some cases, such as Matsushita's shutdown of its Moorhead, North Carolina plant, the discussion is about stolen futures and lost opportunities, not just for the workers who lost their jobs, but also for the next generation that follows. As, *New York Times* reporter David Firestone, explains, in the aftermath of Matsushita's announcement, "stunned workers now contemplate a future of sporadic, lower-paying jobs" (Firestone 2001: A-12). One Matsushita worker, forty-eight year old Helen Dishman, remarked to Firestone: "Look at this place -- I thought I would

retire here. Now I'll be lucky to find something that doesn't even pay as much" (Firestone 2001: A-12). David Peters, a pump repairman at the factory, told the *New York Times* reporter, "We've got plants closing right and left, and I don't know who's going to hire us. If something doesn't happen soon, this whole area's going to have a lot of vacation time and no vacation pay" (Firestone 2001: A-12).

For some communities, the loss of jobs is only part of the story of how the pursuit of low-cost manufacturing has impacted their town. When cell phone manufacturer Ericcson decided to move production from its Lynchburg, Virginia facility to Mexico, Brazil, and eventually China, the city not only faced the loss of jobs, but a significant loss of tax revenue. Three years after Ericcson was promised $500,000 in state and local incentives to expand operations at its Candlers Mountain facility, the company announced it would relocate between $60 million and $80 million worth of equipment overseas. As a result, Lynchburg lost approximately $650,000 in machinery and tools tax revenue. The city, already struggling to balance its budget, was forced to make cutbacks in the fire department and sheriff's department and faced a significant shortfall in its school system budget (*The News and Advance* 2001).

In other cases, such as the one involving Ohio Arts Co., maker of the Etch-A-Sketch toy, the very identity of the town seemed to leave along with the company that moved out. After forty years of production in Bryan, Ohio, Ohio Arts announced last fall that it would move production to China. About thirty workers were employed in the injection molding and assembly operation dedicated to producing one of the nation's most enduring toys.

Much of Ohio Arts' other toy production had already been moved to China, but this last toy held great symbolism for the small town. According to the Associated Press, although the move will only result in the loss of a few dozen jobs, "the loss will be a symbolic blow to the city

of 9,000 people" (*Associated Press* 2001: D09). Mike Tressler, a reporter from the *Pittsburgh Post-Gazette* adds, "The announcement was made at almost the same time an 18-foot Etch A Sketch model was erected among Christmas decorations on the courthouse square. On New Year's Eve, a sparkling ball will descend from the tower at midnight, and stop at the model Etch-A-Sketch**,** which will blink and light its screen with '2001.'" Bryan mayor, William Runkle told Tressler, "When an official guest is here, I don't give them a key to the city. I give them an Etch-A-Sketch" (Tressler 2001: E-2).

According to Ohio Arts, the move was necessary for financial reasons. The company claims that it has been losing money for the last several years and needed to move to China where the labor is cheaper. The last American-made models came off the assembly line December 22, 2000 (*Associated Press* 2001).

Another case that had a devastating impact on the neighboring community involved Converse "Chuck Taylor All Star" shoes. Converse, Inc., announced earlier this year that it will move the production of its famous shoes to Asia to save costs. Converse filed for bankruptcy in January 2001, after five years of declining sales. However, Converse has battled bankruptcy before and survived. But in March 2001, the 93-year-old company laid off its last thousand U.S. workers in Lumberton, North Carolina, and Mission, Texas, and closed its last North American manufacturing plants, including a stitching plant in Reynosa, Mexico.

The company now has only a small percentage of the shoe market, but still sells about 10 million pairs a year, half of which are Chuck Taylors. Until recently, half of the 10 million shoes were made in the U.S., and stamped with a patch on the heel that says, "Made in the U.S.A." (*The News Tribune* 2001)

Lumberton, North Carolina, was hit hard by news of the closing, as it has suffered other major plant closings recently, including textile manufacturing. While by the early 1990s North Carolina had become the state with the largest percentage of its workers in manufacturing jobs (Firestone 2001), in the past year, 48,800 manufacturing jobs were lost in North Carolina -- more than any other state (Rives 2001). Lumberton alone has seen some 6,500 factory jobs disappear since 1996 (Jonsson 2001).

According to *Christian Science Monitor* reporter Patrik Jonsson:

> So far, residents are staying. But their town is becoming little more than an amalgamation of flea markets as people struggle to find anything paying. 'We're all going to be fixing each other's lawnmowers here, is the problem,' says Jock Nash, Washington counsel for Milliken & Co., a textile firm.
>
> For many, watching a factory like the Chuck Taylor plant move its jobs overseas is the first time the implications of a global economy hit home. "It's a powerful example of how free trade can actually affect American culture," says Sanjay Mongia, an analyst with the Economic Strategy Institute in Washington.
>
> A plant closing doesn't just mean the loss of jobs in a town like Lumberton**.** It means the loss of good jobs. A report released this month by the U.S. Bureau of Labor Statistics says that an average factory wage of $442 per week is largely being supplanted by new retail jobs that pay $276--often without benefits. But people in towns hit by layoffs aren't moving to find even those jobs. According to a recent North Carolina State study, they're trying to survive in place.
>
> That's what Linda Lowry is doing. One of the original workers hired in 1972 to build Converse shoes at an old Goodyear rubber plant, Ms. Lowry is awaiting a small severance check. She's enrolled in Robeson Community College in May, but has no idea how she'll pay her bills until then.
>
> "Americans don't care much about 'Made in the USA' anymore," Lowry says with resignation (Jonsson 2001: 3).

Overview on Production Shifts from other Countries into China

In examining the full impact of U.S. trade and investment relationships with China, it is essential that we do not limit the focus of our media tracking to production shifts from the U.S. to China. The U.S. is not the only country that has recently experienced dramatic increases in trade and investment relations with China. The employment and wage effects of PNTR and China's upcoming entrance into the WTO are also not limited to the U.S. Thus, when designing this study we proposed to track not only production shifts out of the U.S. to China, Mexico, and other Asian and Latin American countries, but also production shifts from these same Asian and Latin American countries into China. We hypothesized that, as with many companies shifting business from the U.S. into China, many shifts from other countries to China would have been from long standing companies based in the country of origin. We also hypothesized that, as with U.S. companies, some portion of the production shifts into China would be directed at the expanding Chinese market. However, we also believed that a significant portion of production shifts out of countries such as Korea, Japan, Taiwan, Mexico, and Indonesia were part of a increasingly rapid shifting of production by some of the world's largest multinationals, first from the U.S. to those countries and then from those countries into China, in a never-ending search for the lowest labor costs and the most investor-friendly trade policies.

As we can see from the following discussion of our findings for companies shifting production out of Asian and Latin American countries into China, the media-tracking data provide strong support for our hypotheses. In fact, our media searches found that, particularly for countries such as Japan and Taiwan, the impact of production shifts to China has had just as much, if not more, of an impact on wages and employment in those countries, as production shifts from the U.S. to China have had on wages and employment in the U.S.

Unlike in the U.S., where we are just at the beginning of an economic downturn and overall unemployment levels remain relatively low, production shifts in most of Asia have been occurring in the aftermath of the 1998 region-wide economic crisis with massive numbers of plant closings and layoffs in many industries. The effects of the Asian economic crisis still linger today and, in fact, appear to be compounded by the massive shifts of production to China that are occurring during this period.

The wave of production shifts from Asian countries into China started first in Hong Kong in the aftermath of the reunification of Hong Kong with Mainland China in 1997. In the next two years a large number of Hong Kong-based manufacturing operations shifted production into the mainland (*Australasian Business Intelligence* 2000). By October 2000, when we started our media tracking, the number of manufacturing production shifts from Hong Kong to China had slowed down significantly. More recently there has been a wave of company relocations from Hong Kong to China in business services, including banking services, call centers, and printing services (*Low* 2001; *AFX Asia 2001*; *Hong Kong Economic Journal* 2001). Perhaps the most dramatic example of these was the Hong Kong and Shanghai Banking Company (HSBC) that in March 2001 relocated its data collection office from Hong Kong to Guangdong province in China, slashing 1200 back-office jobs. HSBC is the oldest corporation in Hong Kong, and its departure set up alarms everywhere in Hong Kong. Soon after HSBC moved its jobs to China, several other banks announced they plan to follow HSBC to China later this year (*AFX Asia* 2001).

For other Asian countries, the movement into China has been much more recent. For example, Taiwanese Economic Ministry officials report that in March 2001 alone, 1,341 plants closed, more than twice as many as the number that had closed in February 2001 and nearly four

times the number that had closed during March 2000. In 2000, a total of 5,000 factories closed, putting more than 100,000 Taiwanese production workers out of work (*Agence France Presse* 2001a). While almost as many new manufacturing facilities opened up in the same time period, the total number of new manufacturing facilities was down 1.97 percentage points from the total number of new facilities registered with the government the year before (Wang 2001). Government officials expect the number of manufacturing shutdowns to worsen in 2001 perhaps even surpassing the 6,788 plant shut downs that occurred during the depths of the economic crisis in 1998 (*Agence France Presse* 2001a)

Taiwanese Industrial Development Bureau (IDB) officials attribute a significant portion of these plant shutdowns to the dramatic exodus of Taiwanese-based production facilities to China in search of "lower labor and land costs to stay competitive amid the economic slowdown at home" (*Agence France Presse* 2001b: 1). In many cases this exodus has occurred with the full encouragement of the Taiwanese government (Lai 2001).

This shift has been especially noticeable in Taiwan's information technology (IT) industry. According to Philip Liu from the *Taiwan Economic News,* "all five of the leading manufacturers in each of Taiwan's largest IT lines (desktop PCs, motherboards, scanners, CD-ROM disk drives, and monitors) have set up manufacturing operations in the mainland" and "production in the mainland now accounts for 45 percent of the total output of Taiwan's PC and motherboard industries" (Liu 2000a: 1-2). Although by the end of 2001 China is expected to overtake Taiwan as the third largest information technology producer in the world, 73 percent of China's IT output will come from factories with Taiwan investments (Liu 2000a).

Such shifts of production and investment are not limited to information technology. Approximately a third of all companies listed on the Taiwan domestic stock market have set up

operations in China, for a total investment of $30 billion, including industries such as automobiles, mobile phones, metal, plastics, textiles, and home appliances (Liu 2000; Liu 2001; *Agence France Press* 2001b). Japanese media report a similar wave of manufacturing shifts to China. Although traditionally hesitant to lay off workers in their own country, the combination of falling consumer prices and a falling stock market has pressured more Japanese companies to either move production to China or outsource production to Chinese contract manufacturers. As Takabumi Suzuoki recently reported in the *Nikkei Weekly*,

> Many Japanese companies have been operating plants in China for years. In most cases, however, their Chinese factories focused mainly on lower-end products that can no longer be made profitably in Japan. Now manufacturers are shifting production to China of any product that can be made there at lower cost (Suzuoki 2001: 1).

Although, traditionally viewed as a successful export-oriented economy with a consistently strong trade surplus, media and government reports indicate that Japan's position in the Asian regional market is changing radically. From consumer electronics, to steel, petrochemicals, machinery, motorcycles, photo-copiers, and dish towels, Japanese producers are now scrambling to move operations to China, so much so that, according to Suzuoki, Japanese executives on the front lines of the production shift to Asia are already warning that the day will come when Japan turns into a country with a chronic trade deficit, like the U.S. (Suzuoki 2001).

Gillian Tett from the *Financial Times* reports that the Japanese monthly trade surplus in April 2001 was 42 percent lower than it was in April 2000, largely due to a surge in imports from Asian countries such as China. Tett argues that the changes in the import/export ratios are not the result of strong domestic demand in Japan, but rather the rising imports result from government trade policy and production relocation to other Asian countries, China in particular.

The imports are not coming from foreign competitors, Tett reports, "Indeed, a large part of the 'foreign' imports that are flooding into Japan have been produced by Japanese-owned companies based in Asia" (Tett 2001: 13).

Just as with companies shifting production out of the U.S., these Japanese production shifts are not limited to low-skill, labor-intensive industries. According to Tett:

> The items that contributed to the 13.2 percent import rise were not just the 'cheap' consumer items such as T-shirts, but components and machinery as well. In the year to April, for example, China sold about [USD$1.49 billion] of textiles to Japan, 30 per cent up from the previous year. More surprisingly, China sold [USD$1.29 billion] of machinery to Japan, a rise of 26 percent (Tett 2001: 13).

The recent wave of production shifts has not been limited to Asia. Now Mexico, as well, is feeling the pressure of cheaper Chinese labor markets. Japanese-owned Sanyo Electric Company is just one example of multinationals with operations in Mexico that are now looking toward China. In December 2000, Sanyo announced plans for corporate restructuring, particularly focused on consolidating North American facilities and moving production to China. Over the past year, the company had already eliminated about 5,000 jobs, but the December announcement revealed plans to expand cutbacks to a total of at least 6,000 jobs (*Consumer Electronics* 2001).

In January, Sanyo announced that it had closed its 100,000 square foot appliance manufacturing facility in Tijuana, Mexico, and moved the production to China. About 200 workers lost jobs. The plant, the first one Sanyo established in Tijuana around 1980, produced vacuum cleaners, small fans, and juicers (Allen 2001).

Alan Foster, vice president of Sanyo North America Corp., based in San Diego, noted, "As it turned out, fans being produced in our factories in China come cheaper through the Port of Long Beach than the fans we were producing in Tijuana" (Calbreath 2001: H1).

The Japanese company also expanded production of a number of products in China. It started production of digital videodisc players for the U.S. market in China at the end of September 2000 (*China Economic Review* 2001). Sanyo also opened facilities in the Beijing Economic and Technological Development Zone to manufacture components for Nokia (*China Online* 2001).

The company plans to close other North American facilities in the future, including moving vacuum cleaner production from Mexico to China by the end of 2001 (*Appliance* 2001). Sanyo Electric also decided to move a laser head production line in South Korea to China (*Asia Pulse* 2000).

Media-tracking Findings for Production Shifts from Other Countries into China

As described earlier in Table 2 (page 12) we found that between October 1, 2000 and April 30, 2001, a total of 183 companies shifted production to China from the Asian and Latin American countries on which our study focused, including 69 from Japan, 60 from Taiwan, 20 from Korea, 26 from other Asian countries, 7 from Mexico, and 1 from Brazil. We did not find any production shifts to China from any of the other Latin American and Caribbean countries or from Vietnam, Thailand, Cambodia, or Burma (Myanmar). Unlike for production shifts out of the U.S., the number of production shifts out of these other countries to China fluctuated from month to month rather than gradually increasing over the seven-month period.

Estimated Number of Jobs Lost

It was a great deal more difficult to find reliable information on the number of jobs lost in specific production shifts from Asia and Latin America than it was for production shifts from the U.S. We found that newspapers in the U.S. were much more likely to report the number of jobs being lost than newspapers in Asian countries. Also, the overwhelming majority of U.S. companies shifting to China were publicly-held corporations, so the number of employees for each facility was usually recorded in documents and reports filed with the Securities Exchange Commission. Even for privately-held U.S.-based corporations we were often able to find the number of employees for closed facilities by using TAA, NAFTA TAA, and fee-for-service online research databases.

This was not the case for Asian-based companies. In fact we were only able to find employment data for twenty-three of the production shifts out of Asian countries into the China, which represents only 13 percent of the 177 total cases of production shifts from other Asian countries into China. For those companies where we did find employment numbers, the company size averaged slightly smaller than the companies moving from the U.S. to China or the U.S. to Mexico. However, because the number of cases is so small, we do not consider these reliable figures, and so are not reporting the results.

The only country where we were able to find some estimation of the total jobs being lost through production shifts was Taiwan, where there were several media stories describing industry employment trends. As mentioned above, Taiwanese government figures report 100,000 jobs lost from plant closings in 2000, most of which could be attributed to production shifts to China work (*Agence France Presse* 2001a). However, we were not able to find comparable job loss data for any of the other countries in our study.

Industrial Sector

Figure 6 describes the industries and economic sectors where our media tracking found production shifts out of Mexico, Japan, Korea, Taiwan, and other Asian countries to be concentrated.[16]

Figure 6: Distribution of production shifts to China by industrial sector

[16] A more detailed description of the industry data for this table is provided in Appendix 1, Table A1b.

For all countries, the great majority of production shifts occurred in the electronics and electrical equipment industry. Sixty-seven percent of production shifts from Taiwan, 55 percent from Korea, 52 percent from Japan, 77 percent from other Asian countries, and 57 percent from Mexico were in electronics and electrical equipment, covering a broad range of products including mobile phones, lap top computers and PCs, photocopiers, and color televisions. For Taiwan, other significant industries moving production to China include textiles (13 percent), appliances (8 percent), petrochemicals (3 percent), plastics (3 percent), and apparel and household goods (both 2 percent).

For Korea the primary industries besides electronics and electrical equipment where production shifts to China occur include automobiles, petrochemicals, fabricated metals, and textiles (all 10 percent) and machinery (5 percent). For Japan they include apparel (15 percent), machinery (6 percent), auto parts, petrochemicals, and household goods (all 4 percent) and automobiles (3 percent). For other Asian countries, which had more than three-quarters of their production shifts in the electronics and electrical equipment industries, other industries include call centers and banking services (12 percent), and petrochemicals, machinery, and plastics (all 4 percent). Production shifts from Mexico to China, other than electronics and electrical equipment were concentrated in appliances, petrochemicals, and toys (all 14 percent).

Unlike in past decades when most production in China was concentrated in low-end assembly line production that depended on a large supply of cheap labor, the data described above suggest that Chinese production has become increasingly sophisticated, and, like their U.S. counterparts, Asian-based multinationals are taking advantage of that sophistication. One example of this is the Japanese car and motorcycle manufacturer, Honda, which in

March 2001 announced that its Japanese-Chinese joint venture, Guangzhou Honda Automobile, planned to increase production two-fold in China to 30,000 vehicles in 2001. Honda also announced that it will shift its China operations from "knockdown assembly" to local procurement of 40 percent of parts by the end of 2001 (*China Economic Review* 2001).

Just a few months before, in January 2001, Honda had announced that it planned to drastically reduce domestic production of motorcycles by 30 percent at the same time it planned to increase overseas production, particularly in China, by more than 60 percent to 7 million units by the end of March 2004 (*Japan Transportation Scan* 2001).

Company Characteristics and Structure

Like the U.S.-based companies shifting production into China, those from Asia and Latin America also tend to be large multinationals, most of which (more than 80 percent) are publicly held, selling shares on the U.S. stock exchange as well as the domestic stock exchange in their base country (Table 6).

Table 6: Company structure for production moves to China: October 1, 2000 - April 30, 2001

Percent of companies with the following characteristics:	Moves from Taiwan	Moves from Korea	Moves from Japan	Moves from Mexico	Moves from Other Asian countries
Publicly held	91%	89%	86%	100%	81%
Privately held	9%	11%	14%	0%	19%
U.S.-based multinational	0%	00%	1%	14%	19%
Foreign-based multinational	100%	100%	99%	86%	81%
Asia	98%	100%	99%	71%	73%
Europe	2%	0%	0%	14%	8%
Australia/Pacific Islands	0%	0%	0%	0%	0%

None of the companies shifting production from Taiwan and Korea into China are U.S.-based multinationals, and only 1 percent of the companies shifting production from

Japan to China are U.S. based. Instead, rather than being U.S. based most of the companies shifting production out of Taiwan, Korea, and Japan, are based in those countries (Table 7).

Table 7: Parent company headquarters country

	Headquarters Country						
Production shift origin country	**USA**	**Japan**	**Taiwan**	**Korea**	**Singapore**	**Hong Kong**	**Europe**
Japan	1%	99%	--	--	--	--	--
Korea	--	5%	--	95%	--	--	--
Taiwan	--	5%	92%	--	2%	--	2%
Other Asia	19%	35%	4%	4%	15%	8%	8%
Hong Kong	--	--	--	--	--	50%	25%
Malaysia	33%	67%	--	--	--	--	--
Singapore	20%	--	--	--	60%	--	20%
Indonesia	--	100%	--	--	--	--	--
Philippines	25%	38%	13%	13%	13%	--	--
Mexico and Brazil	14%	29%	--	14%	--	29%	14%

The most striking example of this involves Japan where we found that 99 percent of the companies shifting production to China are Japanese owned. Japan's leading role in the global economy is also apparent, with Japanese-owned firms accounting for 5 percent of shifts from Korea and Taiwan, 35 percent of the shifts from other Asian countries, and 29 percent of the shifts from Mexico and Brazil. Ninety-five percent of production shifts from Korea into China are Korean-owned business, while 92 of production shifts from Taiwan occurred in Taiwanese owned companies. In contrast, only a slight majority of the production shifts out of Singapore and Hong Kong involved companies headquartered in the country of origin, while none of the production shifts from other Asian countries involved companies headquartered in the country of origin. For companies shifting from Mexico to China, 29 percent were Japanese owned, and 14 percent U.S., Korean or European owned.

From reading the media stories it becomes clear that many of the U.S.-based corporations had only recently moved their production out of the U.S. into Singapore, Malaysia, and Mexico in search of lower labor costs, and saw China as an opportunity to cut costs even further. The most dramatic example of this was the mobile phone industry. Within a few short months in the spring of 2001, the three largest cell phone producers in the world made a series of moves out of the U.S., Mexico, and Asia into China. In early February 2001, the world's largest cell phone company, Nokia, announced that it would cut 1,500 jobs at its Dallas/Ft. Worth manufacturing plant and shift production to other plants in Mexico and Korea. The production shift by Nokia came amidst a larger industry migration of mobile phone manufacturers to low cost countries.

> Although sales of cell phones are expected to grow by more than 20 percent this year, manufacturers had anticipated faster growth and are under pressure to improve profits, analysts said. 'It's vitally important to reduce costs,' said Jeffrey Kagan, an independent telecommunications analyst. 'Ultimately, that means U.S. jobs' (Ahles 2001:1).

Between December 2000 and April 2001 Motorola laid off 26,000 workers, including some 3,000 U.S.-based employees when it closed its only U.S. cell phone factory and shifted production to Mexico and China (Palenchar 2001). The Swedish cell phone company, Ericsson cut some 22,000 jobs during that same time period cutting cell phone production in Sweden, the United Kingdom, and Lynchburg, Virginia (Omatseye 2001; Higgs 2001).

The big three cell phone producers then matched their job cut trends with moves to outsource manufacturing of handsets and other cell phone components to Equipment Manufacturing Service (EMS) providers. After the latest round of downsizing, Ericsson announced that it would outsource most of the manufacturing, as well as the supply chain functions, of its cell phone production to Flextronics International. At the same time,

Motorola announced a $30 billion five-year strategic agreement with Flextronics to outsource its cell phone production (Savage 2001; Ng 2001).

Flextronics, headquartered in Singapore, is the world's second largest electronics manufacturer, after Solectron, another Singapore-based multinational. Shortly after those announcements, Flextronics officials announced that they were shutting down their Singapore manufacturing operations and shifting cell phone production from Singapore and other higher cost locations to their lower cost factories in China. At the same time they announced they were shutting a printed circuit board facility in Austin, Texas and cutting 600 jobs, shifting those jobs to China as well (Serant 2000). By June 2001 Flextronics had already invested $300 million in China and announced plans to set up a mobile telecommunications research and design center in Guangzhou China's "New Technology Development Zone" to focus on "the design, engineering, testing, and specialized manufacturing technologies for end-to-end mobile telecom products to better satisfy the demand for Flextronics' products in China, as well as worldwide" (*Business Daily Update* 2000:1; Ng 2001)

Following the same commodity-driven production processes that have spurred the textile and apparel industries to continually seek the lowest-cost countries, the outsourcing trend of high-tech manufacturers such as Flextronics further accelerates the migration of the cell phone manufacturing industry to which ever countries offer the lowest costs, moving from Europe and the U.S. to Mexico and Singapore and then to China and Malaysia. In the words of Flextronics Asia-Pacific president Ash Bhardwaj,

> With the current slowdown, original equipment manufacturers (OEMs) are demanding that their products be made in the cheapest way possible . . . .We are moving actively in reducing or eliminating any marginal facilities and we are taking this opportunity to focus on the areas that are most beneficial to our customers . . . .You can't fight the

> market trend and the people who fight the market trend will find themselves to be in deep trouble . . . The products that are margin-sensitive have to be done in the low-cost regions of the world. There is no alternative (Divyanathan 2001: S12).

As evidenced by the Flextronics example, similar to the companies shifting production from the U.S. to China, production shifts from Asia and Latin America to China involve some of the world's largest and most profitable multinationals. The total number of parent company employees for companies shifting production from these countries into China averages 20,168 for companies moving out of Taiwan, 95,993 for companies moving out of Korea, 35,932 for companies moving out of Japan, 47,629 for companies moving out of other Asian countries, and 37,958 for companies moving out of Mexico (Table 8).

Table 8: Company characteristics for production moves to China: October 1, 2000 - April 30, 2001

	Moves from Taiwan	**Moves from Korea**	**Moves from Japan**	**Moves from Mexico**	**Moves from Other Asian countries**
Employment characteristics					
Total number of parent company employees	20,168	95,993	36,312	37,958	47,629
Number of U.S.-based employees	1,968	-	6,500	-	126
Financial characteristics					
Annual revenue (USD millions)	$5,528.20	$39,957.96	$16,054.15	$7,122.55	$11,454.86
Net income (USD millions)	$199.34	$948.29	$6,401.22	$45.37	$676.78

Annual revenue for Taiwanese companies moving to China averages $5.5 billion while net income averages $199.3 million. For companies shifting production from Korea annual revenue averages $40.0 billion while net income averages $948.3 million; while for companies moving out of Japan annual revenue averages $16.1 billion and net income averages $6.40 billion; and for companies moving out of other Asian countries annual

revenue averages $11.5 billion and net income averages $676.8 million. Companies shifting out of Mexico average $7.1 billion in annual revenue, but only $45 million in net income.

With the exception of Japan, on average, companies moving from Asia and Latin America to China had neither been in operation as long nor under the same ownership as long as the U.S. companies shifting production to China. As we can see in Table 9, only 8 percent of companies moving production from Taiwan, 17 percent moving production from other Asian countries, and none of the companies moving production from Korea or Mexico had been in operation for 50 or more years. Instead, most of the companies shifting production into China from these countries had been in operation between 20 and 50 years, reflecting the fact that these countries only became large manufacturing centers in the last twenty to thirty years. In contrast, 68 percent of the companies shifting production from Japan had been in operation for more than 50 years.

Table 9: Company history for production moves to China: October 1, 2000-April 30, 2001

Percent of companies with the following characteristics:	**Moves from Taiwan**	**Moves from Korea**	**Moves from Japan**	**Moves from Mexico**	**Moves from Other Asian countries**
Years in operation					
Less than 10	3%	0%	11%	0%	17%
Between 10 and 20	27%	14%	5%	0%	33%
Between 20 and 50	62%	86%	16%	100%	33%
50 or more	8%	0%	68%	0%	17%
Average number of years in operation	28.24	28.57	54.00	35.00	38.50
Years under current ownership					
Less than 10	17%	0%	33%	67%	67%
Between 10 and 20	33%	0%	67%	0%	0%
Between 20 and 50	50%	100%	0%	33%	33%
50 or more	0%	0%	0%	0%	0%
Average number of years under current ownership	18.17	43.00	8.33	12.33	17.00

Reflecting the enormous churning in these economies in the last decade, 67 percent of Mexican companies and also 67 percent of companies from other Asian countries such as Singapore, Malaysia, Philippines, and Indonesia, had come under new ownership in the last ten years compared to 33 percent of Japanese companies, 17 percent of Taiwanese companies and none of the Korean companies.

Union Status

We were only able to find union status for a handful of cases in the data collected on production shifts from other Asian and Mexican countries into China. Unlike for the U.S., where we had access to AFL-CIO data on unionized companies recorded in their Unicore and contract databases, we were not able to obtain access to union data for the Asian and Latin American-based companies in our study during the short period allotted for our research. However, we do know that union density in 1999 averaged 23 percent for Japan, 21 percent for Taiwan, 12 percent for Korea, and 17 percent for Singapore (Korean Labor Institute 2000). Because, like in the U.S., unions in these countries are concentrated in larger manufacturing facilities, we can assume that the impact of production shifts on unions is at least, if not more, intense in those countries as it is in the U.S. Obviously this is an area that merits further research in future studies.

PART IV. MACROECONOMIC FINDINGS ON U.S.-CHINA TRADE AND INVESTMENT

The U.S.-China Trade and Investment Relationship: Macroeconomic Data Analysis

In recent years, China has become one of the U.S.'s most important trading partners, as well as a location for rapidly growing foreign direct investment by U.S. firms. In 2000, China ranked as the United States' fourth largest trading partner as measured by the total volume of trade (exports plus imports) following Canada, Mexico and Japan. The activities of U.S. companies in China have also grown dramatically in the past decade. Foreign direct investment in China by U.S. firms has risen from a level of only $200 million in 1989 to about $7.8 billion ten years later.[17]

According to World Bank figures, in 1999 China had a population four times as large as the United States and produced about one-eighth the volume of goods and services as the U.S. economy (Table 10).[18] The Chinese economy was the world's seventh largest in 1999 with a gross national product of $980 billion while the U.S. was the world's largest economy with a GNP of $8,351 billion that year. China has been among the world's fastest growing economies over the past decade. In the period from 1990 to 1998, the World Bank calculates that China's output grew at an average annual rate of 11.2 percent – a pace fast enough to doubles the economy's size within seven years. For the same 1990-98 period, the United States' economy grew at an average annual rate of 3.2 percent, above the average for the world's industrialized

[17] Trade figures are from the U.S. Census Bureau, Foreign Trade Division. The figures for U.S. direct investment in China are from the U.S. Bureau of Economic Analysis.

[18] All the figures presented in this paragraph are from World Bank Data, *World Development Indicators, 2000.* The latest year presented for comparable data for the U.S. and China is 1999.

countries.[19] Finally, per capita income in China is reported at $780 compared to U.S. per capita income of $30,600 in 1999. These last figures, of course, reflect the position of the United States as one of the world's high-income industrialized countries and China's position among the world's low-income developing countries.

Table 10: Two economies - the United States and China

	United States	**China**
Population, 1999	275 million	1,200 million
Gross National Product, 1999	$8,351 billion	$980 billion
GNP Growth, Average Annual Percentage, 1990-98	3.2%	11.2%
Ranking Among Major Trading Countries, 2000:		
In Volume of Exports	1st	7th
In Volume of Imports	1st	8th
Per Capita Income, 1999	$30,600	$780

Source: World Bank, *World Development Indicators, 2000*

The U.S.-China Trade Relationship in the 1990s

According to U.S. trade data, China was the United States' fourth largest trading partner in 2000 after Canada, Mexico, and Japan as measured by the total volume of trade (Table 11).[20] China overtook Japan as the country with the larges bilateral trade deficit with the U.S. in 2000. The value of imported goods from China exceeds the value of U.S. goods exported to that

[19] Many economists believe that these growth rates for China in the 1990s are overstated but there is not a consensus on the size of the discrepancy. Economic growth in both countries is now thought to be significantly lower than their 1990-98 averages. The growth rates for China peaked in the early 1990s and, according to the *Economist Magazine*, the growth rate for China in the 12 months up to the fourth quarter of 2000 was 7.3 percent. (*The Economist*, March 29, 2001) According to the BEA, the U.S. economy grew by 4.2 percent in 1999 and 5.0 percent in 2000 – however, fourth quarter 2000 growth is reported at a dramatically slower 1.0 percent. (*BEA News Release*, March 29, 2001)

[20] There has been a sizeable discrepancy between the figures for U.S. -China trade flows presented by the United States and those presented by China, with the Chinese data showing a significantly smaller U.S. deficit. Issues surrounding the correct measurement of U.S.-China trade flows and alternative estimates of the size of these trade flows are discussed on page 63 below.

country by a factor of more than six to one. In 2000, the U.S. imported about $100 billion in goods from China while exporting about $16 billion of U.S. goods to China. The resulting $84 billion bilateral trade deficit with China is the largest trade deficit the U.S. held with any country last year and made up almost 20 percent of the total U.S. trade deficit in 2000 (Table 12).

Table 11: Top ten countries with which the U.S. trades: 2000

Country Name	Total Trade in Billions of U.S. Dollars (Exports plus Imports)
Canada	405.6
Mexico	247.6
Japan	211.8
China	116.3
Germany	88.0
United Kingdom	85.0
Korea	68.2
Taiwan	64.9
France	50.0
Singapore	37.0

Source: U.S. Department of Commerce, Census Bureau, Foreign Trade Division

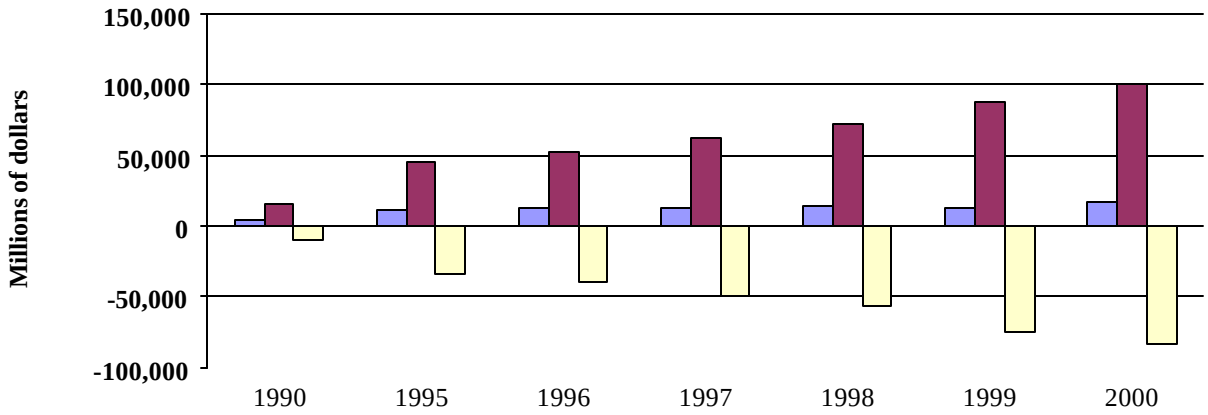
Table 12: Top ten countries with which the U.S. has a trade deficit: 2000

Country Name	Trade Balance in Billions of U.S. Dollars
China	-83.8
Japan	-81.3
Canada	-52.8
Germany	-29.5
Mexico	-24.2
Taiwan	-16.1
Malaysia	-14.6
Italy	-14.0
Venezuela	-13.1
Korea	-12.4

Source: U.S. Department of Commerce, Census Bureau, Foreign Trade Division

Figure 7 shows the growth of exports and imports between the U.S. and China between 1990 and 2000. The U.S. bilateral trade balance with China has grown steadily more negative over the decade as the value of imports from China has outstripped the growth of U.S. exports to China. From a deficit of $10.4 billion and a ratio of imports to exports of about 3:1 in 1990, the U.S. bilateral trade deficit with China has grown to $83.8 billion with an imports to exports ratio of about 6:1. U.S. trade deficits with China between 1995 and 2000 made up between 19 and 25 percent of overall U.S. trade deficits in those years (the U.S. trade deficit reached a record high level of $449.9 billion in 2000).

Figure 7: U.S.-China trade: 1990 and 1995-2000



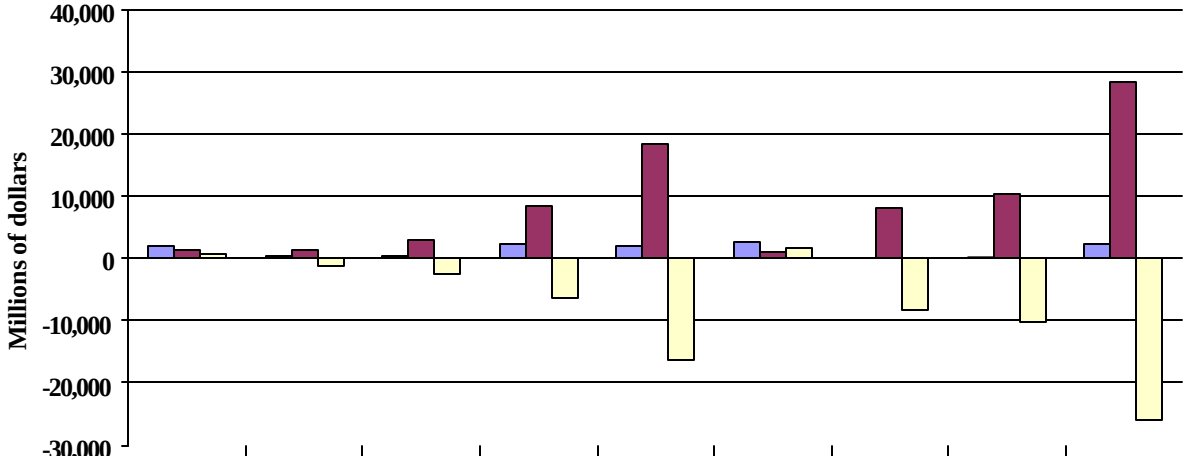
	1990	1995	1996	1997	1998	1999	2000
Exports	4,806.4	11,753.6	11,992.6	12,862.3	14,241.3	13,111.0	16,253.0
Imports	15,237.3	45,543.2	51,512.6	62,557.6	71,168.7	87,788.2	100,063.0
Trade Balance	-10,430.9	-33,789.6	-39,520.0	-49,695.3	-56,927.4	-74,677.2	-83,810.0

Source: U.S. Department of Commerce, 2001. Census Bureau, Foreign Trade Division.

For China, on the other hand, trade surpluses with the United States have stood in contrast to much more balanced trade with the other large industrialized countries in the world. In 1998, according to official Chinese trade figures, China had nearly balanced trade with Japan,

Canada, Germany, France, and Italy and had a trade surplus of about $2.7 billion with the United Kingdom.[21]

Figure 8: U.S. trade with China by industry: 1999



	Chem	Metal-Primary	Metal-Fabricated	Machinery	Electrical	Transport	Apparel	Leather	Other Manuf.
Exports	2,067.9	256.6	395.8	2,233.1	1,897.3	2,642.4	11.5	75.3	2,342.2
Imports	1,494.7	1,411.6	2,806.5	8,552.6	18,258.5	1,008.0	8,244.1	10,253.7	28,260.1
Balance	573.1	-1,155.0	-2,410.7	-6,319.5	-16,361.2	1,634.4	-8,232.6	-10,178.4	-25,917.8

Source: U.S. Department of Commerce, Census Bureau, special compilation

Chart Key
Chemical - Chemicals and allied products, Metal-Primary - Primary metal products, Metal-Fabricated - Fabricated metal products, Machinery - Machinery, except electrical, Electrical - Electrical machinery, equipment and supplies, Transport - Transportation equipment, Apparel - Apparel and related products, Leather - Leather and leather products, Other Manuf. - Other manufacturing (list of industries in footnote 23).

Figure 8, above, shows the U.S. trade relationship with China in 1999 broken down by goods producing industries.[22] The four U.S. industry groups with the largest value of goods exported to China are those classified under the headings of Transportation Equipment,

[21] Official Chinese trade figures from *China National Bureau of Statistics, China Statistical Yearbook 1999*.

[22] The goods producing industries make up almost all of the goods and services trade balance with China. In 1999, the U.S. exported $3.9 billion in private services to China and imported $2.7 billion in private services from China.

Machinery except Electrical, Chemicals and Allied Products, and Electrical Machinery/Equipment (which includes computers.

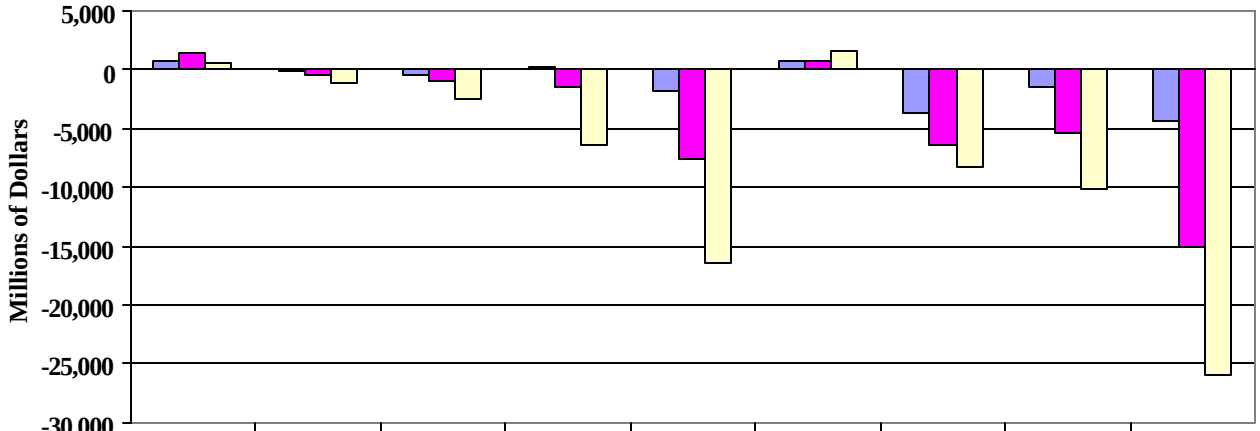
The U.S. industry groups that face the largest volumes of imports from China include Electrical Machinery/Equipment, Machinery except Electrical, Apparel and Related Products, and Leather Goods. The largest trade imbalances with China in 1999 on the industry level are in the industry groups of Electrical Machinery/Equipment ($16.4 billion deficit), Leather Goods ($10.2 billion deficit), Apparel and Related Products ($8.2 billion deficit), and Machinery except Electrical ($6.3 billion deficit). Combined, the set of industries grouped under "Other Manufacturing" had a deficit of $25.9 billion with China in 1999 (although individually, none of these industries ranked among those with very high trade deficits with China).[23]

Figure 9 shows the trade balance with China by industry broken down by industry for 1990, 1995, and 1999. With the exception of the Transportation Equipment industry group, all the groups shown experienced a worsening trade balance between 1990 and 1999. The biggest increase in an industry trade imbalance with China was in the Electrical Equipment industry group where the balance changed from a deficit of $1.8 billion in 1990 to $16.4 billion in 1999. The Leather Goods industry group experienced a worsening of its trade balance with China from a $1.5 billion deficit in 1990 to a $10.2 billion deficit in 1999. The Machinery industry group saw its trade balance with China fall especially rapidly in the four years from 1995 to 1999 - from a surplus of $314 million in 1990, the Machinery group moved to a deficit of $1.4 billion in 1995 and then to a deficit of $6.3 billion in 1999. The group of goods-

[23] The "Other Manufacturing" category consists of the following industry groups: Tobacco Manufacturers, Textile Mill Products, Lumber and Wood Products - except Furniture, Furniture and Fixtures, Paper and Allied Products, Printing, Publishing and Allied Products, Rubber and Miscellaneous Plastic Products, Stone, Clay, Glass and Concrete Products, Scientific and Professional Instruments, and Miscellaneous and Not Otherwise Identified Manufactured Commodities.

producing industries classified as "Other Manufacturing" also experienced a large growth in trade deficits with China from a $4.4 billion deficit in 1990 to a deficit of $25.9 billion in 1999.[24]

Figure 9: Trade balances with China by industry group: 1990,1995, 1999



	Chemical	Metal-Primary	Metal-Fabricated	Machinery	Electrical	Transport	Apparel	Leather	Other
1990	850.3	-103.8	-338.0	313.7	-1822.3	756.5	-3731.7	-1490.2	-4371.5
1995	1372.3	-473.0	-863.2	-1356.9	-7546.8	782.0	-6393.5	-5419.9	-15105.6
1999	573.1	-1155.0	-2410.7	-6319.5	-16361.2	1634.4	-8232.6	-10178.4	-25917.8

Source: U.S. Department of Commerce, Census Bureau, special compilation.

Chart Key
Chemical - Chemicals and allied products, Metal-Primary - Primary metal products, Metal-Fabricated - Fabricated metal products, Machinery - Machinery, except electrical, Electrical - Electrical machinery, equipment and supplies, Transport - Transportation equipment, Apparel - Apparel and related products, Leather - Leather and leather products, Other - Other manufacturing (list of industries in footnote 23).

[24] Data on the bilateral trade balance with China broken down at a more detailed industry level is presented in Table 17 on page 91. The detailed industry categories presented in Table 17 correspond to industry categories used in the Media-tracking System.

The Debate over Measurement of U.S. Trade Flows with China

For China, much more than for other U.S. trading partners, significant potential sources of distortion exist in measuring the value of goods traded with the United States. Understanding the important problems involved in accurately measuring U.S. trade flows with China is essential for studying the U.S.-China trade relationship and for forming optimal U.S. trade policy. One outcome of the difficulties surrounding the measurement of trade between the United States and China is that the U.S. and China report greatly differing official estimates of the balance of trade between the two countries. This discrepancy between U.S. and Chinese valuations of their bilateral trade balance can contribute to unnecessary and unproductive disagreements and disputes over trade.

As described in Table 13, for 1998, the U.S. bilateral trade deficit with China officially reported by the United States was close to three times the size of the official figure reported by China. In that year, the U.S. reported a goods trade deficit with China of $57 billion while Chinese government figures show this deficit as only $21 billion – a difference of $36 billion. The size of the discrepancy between the U.S. and Chinese estimates for their bilateral trade balance has been growing throughout the 1990s as the volume of trade between the two countries has risen.

Table 13: Estimates of the U.S.-China trade balance: U.S. and Chinese data
(Billions of Dollars)

Year	U.S. Data	Chinese Data
1990	-10.4	1.4
1991	-12.7	1.8
1992	-18.3	0.3
1993	-22.8	-6.3
1994	-29.5	-7.5
1995	-33.8	-8.6
1996	-39.5	-10.5
1997	-49.7	-16.4
1998	-56.9	-21.0
1999	-74.7	NA
2000	-83.8	NA

Sources: U.S. Bureau of the Census, Foreign Trade Division for U.S. data; China National Bureau of Statistics, China Statistical Yearbook, 1999.
Notes: A negative sign denotes a U.S. trade deficit and a positive sign denotes a U.S. trade surplus. NA – not available.

Studies by Feenstra, Hai, Woo, and Yao (1998) and Fung and Lao (1999) argue that U.S. figures overstate the size of the U.S. trade deficit while the Chinese figures understate it. They point to two major sources for these measurement discrepancies: (1) differences in how the U.S. and China record goods originating in China and re-exported through Hong Kong;[25] (2) differences between the U.S. and China on measurements used to calculate the value of imports

[25] Re-exports take place when imports from one country are consigned to a buyer in another country who takes possession of the goods and then sells and ships the imported goods to a party in a third country. To be considered re-exports, the imports must not be subject to substantial manufacturing operations before re-export to the third country, although they may undergo simple processing, such as sorting or packaging, or service activities, such as marketing or shipping.

and exports. Still others argue that both U.S. and China official trade figures underestimate the total value of imports from China into the U.S. because they fail to account for the high level of false invoicing or transshipments where goods produced in China are falsely labeled as being produced in other countries in order to circumvent U.S. customs (Customs Service 2000). The following summarizes the arguments regarding the possible under- and over- estimation of the U.S. trade balance.

Feenstra et al.: The Re-export Argument

According to Feenstra et al., differences between U.S. and Chinese trade data arise because U.S. Customs records imported goods originating in China and re-exported through Hong Kong as Chinese imports while the Chinese data to a large extent records these goods as exports to Hong Kong rather than the United States. Secondly, they argue that between the origination of these goods in China and their re-export to the United States from Hong Kong, the price of these goods are substantially marked up by the Hong Kong intermediaries. Thus, according to Feenstra et al., the value of re-exported goods is recorded at a substantially higher level upon reaching the United States compared to their recorded value by Chinese Customs when they left China. Based on their estimates, between 1995 and 1998 between 44 percent and 61 percent of all imports from China to the U.S. went through Hong Kong as re-exports. Similarly, in 1995, about 42 percent of U.S. exports to China were first shipped to Hong Kong and then re-exported to China.[26]

Once re-exports that originated in China reach the United States it is usually possible for U.S. Customs to identify China as the country of origin. However, when these are exported from

[26] Calculated from data provided by the Hong Kong Census and Statistics Office cited in Feenstra, Hai, Woo and Yao (1998) and U.S. Census Bureau, Foreign Trade Division.

China to Hong Kong, the final destination of the goods is often not known by Chinese Customs. As a result, many of the goods destined to be U.S. imports are not recorded as such in Chinese trade data. Since 1993, Chinese Customs officials have attempted to better determine the final destination of goods exported to Hong Kong. However, they have been only partially successful and many goods bound for the United States are still not recorded as exports to the U.S. In 1995, only about half of the Hong Kong re-exports to the U.S. originating in China were reported as such in Chinese trade data.[27] There is also a substantial share of U.S. exports to China that are funneled through Hong Kong as re-exports to China (about 42 percent in 1995). It is possible that some of these Hong Kong re-exports originating in the U.S. and bound for China are not identified correctly as U.S. exports to China in U.S. trade data.

For Feenstra et al. the bigger problem for U.S. trade data in regards to China is that the U.S. does not account for the markups of Hong Kong re-exports paid to Hong Kong middlemen involved in the simple processing and shipping of Chinese goods to the United States. A survey of re-export trade carried out by the Hong Kong Census and Statistics Department showed the average re-export markup on Chinese exports to the United States is about 25 percent while the U.S. re-export markups on U.S. goods bound for China averaged only 6 percent (Fung and Lao 1999). Feenstra et al therefore argue that the 25 percent markup that gets paid to Hong Kong middlemen, not to China, inflates the value of Chinese imports in U.S. data.

[27] This figure, and the following figure on the share of U.S. exports to China re-exported through Hong Kong, is from Hanson and Feenstra (2001). They use trade data provided by the Hong Kong Census and Statistics Office and by the Customs General Administration, People's Republic of China.

Fung and Lao: Import/export measurement.

Customs officials and government statistical agencies use several different methods to measure imports and exports. Exports are generally reported officially on an f.o.b. (free on board) or an f.a.s. (free along side) basis while imports are generally measured on a c.i.f. (cost, insurance and freight) basis. The f.a.s. value of exports is the value of the goods at dockside before being loaded aboard a vessel or aircraft. The f.o.b. value of exports includes the cost of loading the goods from alongside the vessel or aircraft onto the vessel or aircraft. The United States measures the value of exports using the f.a.s. method while China (along with most other countries) uses the f.o.b. method of measuring exports. Generally, the difference between f.o.b. and f.a.s. (that is, the costs of loading the goods on board) is low relative to the total costs of the goods. Imports, on the other hand, are measured by agencies in both China and the United States using the c.i.f. method, which includes the cost of insurance and freight incurred in shipping the goods from the exporting country to the importing country.

Fung and Lao estimate the c.i.f. cost to be, on average, 10 percent above the f.o.b. cost (Fung and Lao 1999). The larger the size of bilateral trade between the two countries, the greater the discrepancy between the recorded trade balances arising from using the standard methods of measuring trade flows (that is, measuring exports on an f.o.b. basis and imports on a c.i.f. basis). They conclude that to correctly measure bilateral trade balances, it would be better and more accurate for both countries to measure both exports and imports on an f.o.b. basis. By converting the official trade data of the U.S. and China for 1998 to an f.o.b. basis, the large

discrepancy between U.S. and Chinese figures for the bilateral trade balance is reduced by about 22 percent, from $36 billion to $28 billion in 1998.[28]

False invoicing and Transshipments

In contrast to the re-export and f.o.b./c.i.f arguments, which suggest that official U.S. trade data overestimate the value of imports from China, the issue of transshipment (or false invoicing) suggests that U.S. figures may substantially under estimate import values. Transshipment of Chinese goods to the U.S. involves the shipping of goods to a third country to be labeled there for the purpose of importing them into the United States as exports of the third country rather than China. The U.S. Customs Service actively focuses on the transshipment of goods through third countries to get around U.S. quota restrictions on textile and apparel goods into the United States. According to the Customs Service, the majority of illegally transshipped textile goods originate in China (Customs Service 2000). Firms in Hong Kong, Taiwan, Macao, Malaysia, Singapore, Thailand, Cambodia, and other Asian nations have been investigated by U.S. Customs for re-labeling textile and apparel goods produced in China to circumvent U.S. customs restrictions. Over half of the textile firms surveyed in Hong Kong were suspected of being involved in the transshipment of Chinese goods to the United States. It has been estimated that transshipments of Chinese textile goods amount to several billion dollars a year (Barton 2000).[29]

[28] Both the U.S. and Chinese import figures are adjusted from a c.i.f. basis to an f.o.b. basis by discounting their values by 10 percent. U.S. exports are converted to an f.o.b. basis from an f.a.s. basis by increasing values by 1 percent. The U.S. figure for the 1998 bilateral trade balance becomes -$50.3 billion (from -$57 billion) and the Chinese figure becomes –$22.5 billion (from -$21 billion).

[29] According to Barton (2000) the U.S. Custom Service is reported to have estimated illegal Chinese textile transshipments at about $2 billion; the American Textile Manufacturers Institute estimates the figure at about $4 billion.

In addition to transshipments of textiles to bypass U.S. quota restrictions, there may also be Chinese transshipment of goods to the U.S. to overcome other sorts of government restrictions or consumer reluctance to buy certain types of goods with "Made in China" labels.

Other Trade Measurement Problems

In addition to re-exports, re-export markups, the c.i.f. basis of measuring imports, and transshipments, other factors that might complicate the measurement of U.S.-China trade flows include the understatement of the volume of imports entering China as a result of smuggling. It is estimated that billions of dollars worth of automobiles, cigarettes, and refined petroleum products are smuggled into China each year. It is, of course, difficult to estimate the value of U.S. goods that are smuggled into China and not recorded in the official trade statistics. Transfer pricing can also distort trade statistics. Transfer pricing involves over- or under-invoicing exports or imported inputs in order to avoid taxes or evade capital controls. This practice is relatively easily carried out between units of multinational firms in which prices can be set internally. To avoid Chinese government controls on the movement of capital abroad, for instance, a U.S. firm might over-invoice goods produced in its U.S. plant and sold to its Chinese affiliate, thus inflating the value of U.S. exports to China. Similarly, to avoid U.S. import charges companies importing Chinese-made goods into the U.S. might under-invoice goods produced in China and sold in the U.S.

Debate over Adjusted Estimates for the Size of the U.S.-China Bilateral Trade Balance

Fung and Lao (1999) contend that U.S. trade balance estimates must make adjustments for the c.i.f. measurement of imports, Hong Kong re-exports and re-export markups to arrive at more realistic estimates of the U.S.-China trade balance. Their estimate for 1998 shows a U.S. trade deficit with China of $37 billion, compared to the official U.S. figure of $57 billion for that

year and the official Chinese figure of $21 billion.[30] According to their figures, if the same proportion between an adjusted estimate and the U.S. official trade data held for 2000, the estimated U.S. trade deficit would be about $55 billion compared to the official figure of $84 billion. This would still indicate a very large and growing bilateral trade deficit with China – only the U.S. trade deficit with Japan was larger than this estimated figure of $55 billion in 2000. Feenstra, Hai, Woo and Yao (1998) also made revisions to the official trade data to account for the role played by Hong Kong re-exports in U.S.-China trade. Like Fung and Lao, their revisions to the trade data for 1995 suggest a U.S. trade deficit with China about a third lower than the official U.S. figure for that year.

In adjusting the U.S. official figure for the trade deficit with China downward, neither of these estimates take into account the transshipment of goods or the effects of transfer pricing. Taken together, these omitted factors may significantly offset the downward adjustment of the official U.S. figures for the bilateral trade deficit with China. It should also be kept in mind that even the included factors used to revise the size of U.S.-China trade flows are based on rough estimates of the markup on re-exports and the costs of insurance and freight in transporting goods from China to the U.S. Thus, we conclude that while it is likely true that the official U.S. balance of payments overestimates the size of the bilateral deficit with China, it is also likely that a complete accounting of all factors would find a substantially smaller difference from the official figures than suggested by the studies reviewed in this section.

[30] Fung and Lao's figure of $37 billion for the U.S trade deficit with China is calculated by making adjustments to the official U.S. figures. If China's trade data are used as a baseline, Fung and Lao's adjustments arrive at a figure of about $40 billion for the U.S. bilateral trade deficit with China.

U.S.-China Trade and U.S. Employment

Trade is becoming an ever more important part of the American economy. Between 1970 and 2000, exports plus imports as a percentage of GDP grew from about 11 percent to 24 percent.[31] While some Americans may enjoy higher real incomes as a result of increased trade, it is also true that every year more Americans face international competition and threats to their earnings from foreign products and services from abroad. Concurrent with the increased role of trade in the U.S. economy in the last three decades has been a dramatic slowdown (or stagnation) in the growth of wages for American workers together with growing income inequality. Table 14 presents data on the changes in real earnings for American workers from 1973 to 1993. The data show both the low or negative wage growth experienced by most workers in this period, as well as the growing inequality in earnings between the highest and lowest earning groups of American workers. In addition, labor market data have shown an increasing inequality in the earnings of less and more educated workers since 1970. For example, between 1970 and 1995, the median earnings of college-educated workers increased from a level about 40 percent greater than the median earnings of high school educated workers to a level about 70 percent higher.[32] These dramatic changes in the U.S. economy have led to an understandable concern that the growing internationalization of the U.S. economy in recent decades may be a primary cause of the poor wage growth and increased income inequality that has arisen in the U.S. labor market. This concern has only been sharpened by the historically unprecedented large U.S. trade deficits in the 1990s.

[31] U.S. Bureau of Economic Analysis, various years, online data.

[32] Calculated from U.S. Census Bureau, Current Population Survey, and presented in Collins (1998).

Table 14: Percentage changes in real earnings for full-time, full-year civilian workers: 1973-93

Earnings Percentile	Males	Females
Lowest 5	-21.4	2.1
10	-21.5	-3.0
25	-18.5	2.1
50	-7.5	11.1
75	1.3	19.8
90	7.6	28.9
95	13.9	30.7

Source: From U.S. Census Bureau, Current Population Survey Data, presented in Collins (1998).

Within the broader context of the increased role of trade in the U.S. economy and the slowdown in wage growth in recent decades, U.S.-China trade has attracted particular concern as a potential threat to employment security for American workers. It is not hard to see why this should be the case, given the dramatic rise in Chinese imports to the U.S. in the 1990s and the very large gap between American and Chinese wages. As Table 15 shows, the average hourly wage of production workers in the manufacturing sector in the United States stood at $12.07 in 1994 compared to $0.29 in China, a U.S./China wage ratio of more than forty to one.[33] According to comparisons of international labor data, wages in China are among the very lowest in the world. Table 15 also shows the average hourly wage for manufacturing production workers employed by U.S. firms operating in China for 1994. This figure may provide a better indicator of the wages of Chinese workers engaged in production similar to the kind of manufacturing production carried out in the U.S., as well as indicating the comparable labor costs faced by U.S. firms in China versus the United States. Chinese workers employed in U.S.

[33] 1994 is the latest year for which wage data for China is available.

multinational firms earn almost three times the overall average for Chinese manufacturing workers; however this wage is still only one fifteenth of the wages paid to U.S. workers ($12.07 versus $0.83).

Table 15: Average hourly wage for production workers in manufacturing in the United States and China: 1994

		Hourly Wage
United States		$12.07
China	In Overall Economy	$0.29
	In China-based U.S. Multinational Firms	$0.83

Sources: U.S. wage: U.S. Bureau of Labor Statistics; China wage – Overall: Calculated from International Labor Organization data; China wage – In China-based U.S. Multinationals: U.S. Bureau of Economic Analysis.

An extension of the economic theory of international trade referred to as factor price equalization describes the potential for very low wages in trading partner countries (such as China) to undermine domestic wages.[34] Under given assumptions about the economy, factor price equalization states that freeing trade will equalize factor incomes (i.e., wages) across nations in absolute terms. This implies that the real wages of workers in developed and developing countries will converge at some intermediate common level as trade becomes more open. Given the very low level of Chinese wages, then, the process of factor price equalization suggests that freer trade between the United States and China will cause U.S. wages to fall.

Some attempts to analyze the employment effects of U.S.-China trade were presented in the context of the debate around the decision by Congress to grant China PNTR. In a report

[34] Factor price equalization is derived from the Stolper-Samuelson theorem, which in turn is developed within the framework of the Hecksher-Ohlin model of international trade. See Appendix 2 for a discussion of the economic theory of international trade in regard to free trade's effects on wages. "Factors" refers to factors of production, such as labor and capital.

critical of the trade deal with China, Robert Scott of the Economic Policy Institute makes use of factor content analysis of U.S.-China export and import flows between 1992 and 1999 to estimate the employment effects of large U.S. trade deficits with China (Scott 2000b).[35] His research utilizes U.S. Bureau of Labor Statistics data on employment requirements in 183 industry groups to show that U.S. exports to China generated about 11,200 jobs per billion dollars of exports (measured in 1999 constant dollars), while U.S. imports displaced about 14,300 jobs per billion dollars of imports. Scott concludes that about 680,000 jobs were displaced due to growing trade deficits with China in the years between 1992 and 1999 in the United States. Using Scott's estimates of the job content of trade flows with China, a simple extension of the analysis with trade data for 2000 would set the employment change due to growing U.S. trade deficits with China between 1992 and 2000 at about 770,000 jobs lost.[36]

As Scott notes, when the economy is at or near full employment (as it was in 2000), jobs destroyed by trade will often not result in an increase in the overall level of unemployment. Instead, the main effect of trade on employment will be displacement of the demand for labor from one industry to another, accompanied by the wage changes, earnings losses, and other adjustment costs that this displacement entails. The job loss figures attached to the growing trade deficit with China indicate the extent by which labor demand falls for certain workers in the face of rising import competition from Chinese goods. As labor demand falls in import-

[35] See Appendix 2 for a description of the factor content analysis approach to estimating the employment and wage effects of trade.

[36] A more rigorous replication of Scott's methodology for the 1992-2000 period might have yielded slightly different results. One difference is that we deflate the total export and import figures to constant dollars using the overall Producer Price Index for finished goods, whereas Scott's trade figures are arrived at using industry-specific producer price indices to deflate the value of exports and imports industry by industry. Also, a change in the industrial composition of trade in 2000 relative to 1999 would affect the job content of exports and imports used to calculate job gains and losses.

competing industries, it is expected that wages for U.S. workers in those industries will fall in the labor market as well.[37] In addition, as workers are displaced from import-competing industries, their movement into other industries swells the pool of labor in other sectors. In this way, wages can be pushed down generally for workers across the economy in the face of growing import competition. It is also interesting to note, given the uncertainty of the current economic climate, that under conditions of less than full employment, jobs displaced by imports will show up as unemployment as well as lower earnings for workers.

A report released last year by the Institute for International Economics (IIE) in support of PNTR for China presents an alternative view of the employment effects of trade with China (Hufbauer and Rosen 2000). In the IIE report, Gary Hufbauer and Daniel Rosen argue that there is little direct connection between trade with China and U.S. jobs and they make several criticisms of the analysis presented in the Economic Policy Institute report. Hufbauer and Rosen present two lines of argument to counter those who blame rising trade deficits with China for eliminating U.S. jobs. First, they claim that the size of the U.S. trade balance is set by domestic macroeconomic conditions, thus there is no sense in focusing on the effects of the bilateral trade balance with China. According to their argument, when the U.S. economy is strong relative to the rest of the world (as it has been in recent years), the U.S. trade balance will worsen as growth in U.S. demand for foreign goods outstrips world demand for American goods. Hufbauer and Rosen conclude that there is no independent significance for the bilateral trade deficit with China. They write: "If the U.S. didn't have a … trade deficit with China, it would have a larger

[37] Using a full factor content analysis as described in Appendices 2 and 3, these net job loss figures would be combined with wage elasticities across industries to yield an estimate of the fall in wages for U.S. workers due to rising U.S. trade deficits with China.

deficit with other countries, such as Mexico or Korea" (Hufbauer and Rosen 2000: 9). We find this argument against linking trade with China to U.S. jobs to be unconvincing. While it is true that macroeconomic conditions in the U.S. and abroad are significant short-run determinants of the U.S. trade balance, macroeconomic conditions are not the only causative factors behind the size of trade flows.[38] In particular, national policies and individual country characteristics can play a role in independently leading to changes in both bilateral trade and the size of national trade flows as a whole.

Perhaps anticipating objections to their first argument, Hufbauer and Rosen present a second line of argument against the assertion that trade deficits with China have led to large job losses in the U.S. They contend that, even if trade with China has independent significance, there are flaws in the factor content methodology used in Scott's EPI paper. The IIE paper draws attention to the measurement problems involved in the official U.S.-China trade data (as discussed above) and suggests that Scott's job loss figures are inflated by using U.S. figures that are much too high. The authors also suggest that the increase in Chinese imports results almost entirely from a shift of U.S. purchases from third countries to China. Thus the rise in imports from China should be treated as neutral and not as a new source of import penetration that displaces U.S. jobs.[39] As we discuss below, we do not believe that the trade data support this argument.

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[38] There is strong evidence that, in fact, economic growth and trade balances are mutually determined in the short to intermediate term.

[39] Huffbauer and Rosen write: "…Americans should bear in mind that only a fraction of Chinese production sold in the U.S. market displaces U.S. production. Most imports from China displace the exports of other countries" (2000:9).

In arriving at a range of estimated employment effects from trade with China, we accept the method of factor content analysis used by Scott and consider some of the critiques put forward in the Hufbauer and Rosen paper.

First, in regard to Hufbauer and Rosen's claim that U.S. trade figures adjusted to account for the kinds of measurement discussed above (they cite Fung and Lao 1999) should substitute for official U.S. trade data in the analysis, we believe that this not necessary. Consider a $1000 shipment from China reaching the U.S. that has been re-exported through Hong Kong. This shipment may likely, according to the estimates offered by Fung and Lao, represent a U.S. payment of $700 to the Chinese producers, $250 to Hong Kong intermediaries (the re-export markup), and $50 to Liberia for shipping/insurance (from the c.i.f.). However, as far as our U.S. labor market analysis is concerned, the shipment of Chinese goods is thought of as displacing $1000 worth of domestic goods production. That is, even though the goods would only cost $700 in China, they are valued at $1000 in the U.S. and properly treated in factor content analysis as displacing production valued at $1000 (not $700) in the US. It seems appropriate, looked at this way, for our analysis of job loss to set aside U.S. trade data adjustments for c.i.f. and re-export markups. We are still concerned about the issue of re-exports leading U.S. statistics to misidentify exports to China as being exports to Hong Kong. This adjustment of the data would, by raising the value of U.S. exports, lower the U.S. trade deficit by perhaps $6 to $8 billion.

It is important to stress, at the same time, that the consideration of these measurement problems (due to re-exports, markups, c.i.f.) are important in thinking about the flow of funds internationally and for the official U.S. balance of payment figures. That is, by official definitions of international trade and fund flows, the U.S. official figures should be adjusted for

these things. But the current official figures are actually closer to being the most appropriate for our job loss analysis.

The next issue raised by Hufbauer and Rosen as a critique of Scott's analysis is their claim that the increase in Chinese imports is entirely made up of a shift of U.S. purchases from third countries to China and so should be considered "neutral" in regards to U.S. jobs. However, the evidence seems to suggest otherwise. Even assuming that only the relevant third countries are the other developing economies in East Asia which trade with the U.S., and that changes in the share of U.S. imports from these countries and from China indicate shifts in import supplier, the data does not seem to support Hufbauer and Rosen's claim.[40] Between 1992 and 2000, according to U.S. trade data, the share of Chinese imports in total U.S. imports rose from 4.9 percent to 8.2 percent while the share of the other developing East Asian trading partners fell from 15.2 percent to 13.5 percent.[41] Clearly, then, in the most extreme case, only about half of the rise in China's share of U.S. imports since 1992 (1.7 of the 3.3 percent increase) could possibly be attributed to import shifting from other East Asian developing countries. It is very unlikely, however, that the entire drop in trade with the other East Asian developing countries is due to shifting to China as a supplier of goods. For example, as suggested by our media-tracking data, since NAFTA there has been considerable movement from Asian suppliers to much closer Mexican suppliers for U.S. imports. Without further careful research into this issue, we believe that there is not sufficient support to include an estimate of import shifting into our job loss analysis.

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[40] The developing countries in East Asia we are considering include Brunei, Hong Kong, Indonesia, Korea, Macao, Malaysia, Papua New Guinea, the Philippines, Singapore, and Taiwan.

[41] Calculated from U.S. trade data provided by the U.S. Census Bureau, Foreign Trade Division.

Our job loss estimate, then, takes into account two adjustments to the trade data used in Scott's analysis. First, we note the under-valuation of exports to China in 2000 due to re-exporting through Hong Kong; and second, we take account of the under-valuation of imports from China in 2000 due to transshipments. We estimate the under-valuation of exports from re-exporting to be about $5.5 billion in 2000 and the under-valuation of imports from transshipments to be somewhat lower at around $3.5 billion. After these adjustments to the official U.S. figures for trade with China, we arrive at a job loss estimate in 2000 of about 760,000 jobs. This is essentially the same as the estimate of 770,000 arrived at by simply extending Scott's analysis to 2000 using the official U.S. trade data. This comes about because we assign (as per Scott) a higher level of job loss for the same amount of dollars to imports compared to exports, with the result that our adjustments to the official U.S. trade figures nearly cancel each other out in terms of calculated job losses. [42]

Our job loss estimate of 760,000 for 2000 represents roughly 4.0 percent of total U.S. manufacturing employment in 2000. A fall in labor demand in manufacturing of this magnitude will have a significant negative effect on wages. Our estimate suggests, then, that the dramatic growth in the U.S. trade deficit with China since 1992 has contributed to the wage stagnation that has dominated the manufacturing sector for most of the last decade.

Our preliminary macro analysis therefore add further support to the view documented by our media-tracking data that the rapidly expanding trade deficits between the U.S. and China have had significant negative effects on both employment and wages. These findings also point

[42] Appendix 3 provides a detailed explanation for how the job loss estimate was calculated.

to the great need for further macro level research to provide narrower and more substantiated estimates of the employment and wage effects of trade with China.

The U.S.-China Foreign Direct Investment Relationship in the 1990s

Foreign direct investment (FDI) is defined as investment by a firm in an enterprise operating in a foreign country in which the investing firm has controlling interest.[43] U.S. foreign direct investment in China, then, refers to the investment of U.S. multinational firms in their operations in China. China has experienced a large inflow of foreign direct investment by U.S. and other foreign firms since liberalizing restrictions on the entry of foreign firms into the economy in the early 1990s. Chinese firms, on the other hand, have carried out a much more modest amount of investment in the United States. In 1999, the U.S. direct investment position in China stood at about $7.8 billion while as of 1997 China held a direct investment position in the United States of only about $0.3 billion.[44] Still, U.S. firms hold a relatively small percentage of total foreign direct investment in China -- in 1999, the stock of direct investment in China held by U.S. firms represented only about 2.5 percent of total foreign direct investment in China.[45] The great bulk of foreign direct investment in China has its source in Taiwan and Hong Kong.

[43] The U.S. Bureau of Economic Analysis defines FDI in a broad sense as investment that gives a firm 10 percent or greater ownership in a foreign enterprise. The BEA also reports data for FDI defined by a 50 percent or greater ownership share in foreign enterprises ("majority-owned foreign affiliates).

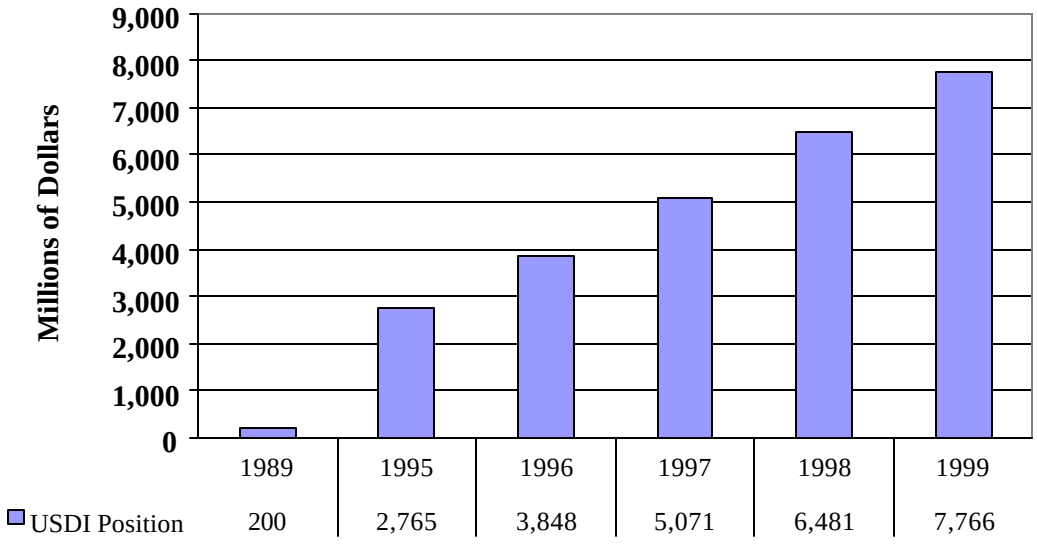
[44] The U.S. foreign direct investment position in China is from the Bureau of Economic Analysis; the Chinese FDI position in the United States is from OECD, *International Direct Investment Statistics Yearbook, 1998*.

[45] Total FDI in China, used to calculate the U.S. share of China's FDI, is from UNCTAD, *World Investment Report, 2000*.

Similarly, the stock of direct investment by U.S. firms in China represented less than one percent of the total stock of U.S. direct investment in all foreign countries in 1999.[46]

Figure 10 shows the growth of U.S. direct investment in China from 1989 through 1999. The movement of U.S. firms into China since 1989 has been dramatic - increasing from $200 million in 1989 to about $2.8 billion in 1995 and then increasing almost three-fold between 1995 and 1999 to reach about $7.8 billion that year.

Figure 10: U.S. direct investment position in China, historical cost: 1989, 1995-99



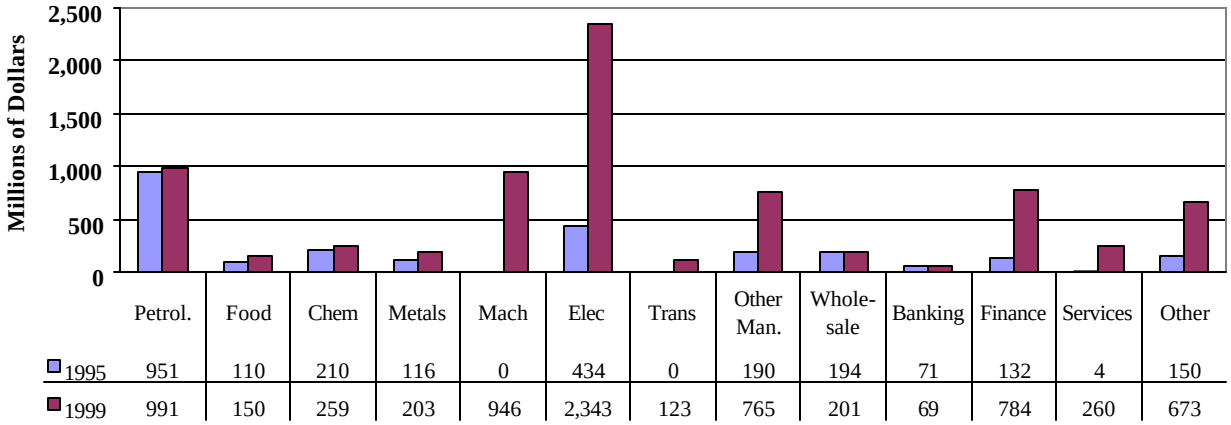
Source: U.S. Department of Commerce, Bureau of Economic Analysis

Figure 11 shows the distribution of U.S. direct investment in China across industry groups in 1995 and 1999.[47] U.S. firms have their largest investments in China in the industry

[46] U.S. foreign direct investment in China and in all other countries is from the U.S. Bureau of Economic Analysis.

groups of Electrical Machines/Equipment, Petroleum Refining/Processing, Machinery, and Finance. Three of these industry groups -- Electrical Machines/Equipment, Machinery, and Finance -- have all had very rapid investment growth in China in the 1995-99 period. It is interesting to note that the Electrical Machinery/Equipment group stands out as the industry with the largest trade deficit with China as well as the largest direct investment in operations in China.

Figure 11: U.S. direct investment position in China by industy, historical cost: 1995 and 1999



	Petrol.	Food	Chem	Metals	Mach	Elec	Trans	Other Man.	Whole-sale	Banking	Finance	Services	Other
1995	951	110	210	116	0	434	0	190	194	71	132	4	150
1999	991	150	259	203	946	2,343	123	765	201	69	784	260	673

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Chart Key
Petrol - Petroleum products, Food - Food and kindred products, Chem - Chemicals and allied products, Metals - Primary and fabricated metal products, Mach - Machinery, except electrical, Elec - Electrical machinery, equipment and supplies, Trans - Transportation equipment, Other Man. - Other manufacturing, Wholesale - Wholesale trade, Banking - Banking services, Finance - Financial services, except banking, Services - Services, except financial, Other - Industries not otherwise categorized.

One way in which the growth in U.S. FDI in China impacts the U.S. economy is through the link between the operations of U.S. multinationals and the growth of U.S.-China trade flows. Multinational firms play a large role in U.S. trade in general. In 1999, trade between two

[47] Industry groups differ somewhat from the ones presented in the discussion of trade above due to differences in how the trade and FDI data are presented.

commonly-owned enterprises located in different countries accounted for 46.7 percent of total U.S. imports and 32.1 percent of total U.S. exports.[48] For China, these figures were 17.6 percent for U.S. imports (or $15.5 billion of $87.8 billion) and 11.7 percent for U.S. exports ($1.5 billion of 13.1 billion) in 1999.

Table 16: Sales of affiliates of U.S. MNCs in China: 1998 (millions of dollars)

	Total	To U.S.		Local sales (China)		To other foreign countries	
	$	$	Percent	$	Percent	$	Percent
Total Sales	14,911	2,169	14.5%	9,547	64.0%	3,195	21.4%
Total Manufacturing	11,050	1,901	17.2%	6,117	55.4%	3,032	27.4%
Industrial Machinery and Equipment	3,122	738	34.3%	773	24.8%	1,279	41.0%
Electronic and other Electrical Equipment	4,029	1,070	18.3%	1,925	47.8%	1,366	33.9%
Chemicals and Allied Products	2,011	20	0.9%	1,893	89.7%	197	9.3%

Source: U.S Department of Commerce. Bureau of Economic Analysis

Table 16 presents data on the share of sales by the foreign affiliates of U.S. multinational firms in China of goods and services that have their destination in the United States, in the local Chinese market, and in other foreign countries in 1998. For foreign affiliates of U.S. firms in China overall, the share of total sales accounted for by exports to the United States was 14.5 percent and the share going towards imports to all countries was 36 percent. These figures

[48] Reported by U.S. Census Bureau, Foreign Trade Division. "Related parties trade" refers to trade between two entities in which one has at least a 10 percent ownership share of the other in the case of exports and at least a 6 percent ownership share in the case of imports.

strongly counter a view often stated during last year's debate on China's PNTR status that U.S. multinationals have invested in China only to serve the Chinese market. In fact, as Table 16 shows, more than a third of all sales by U.S. firms in China were to customers in markets outside of China in 1998.

Among industry groups, there is quite a large range in the distribution of sales across the U.S., China, and other countries for U.S. affiliates in China. In manufacturing as a whole, 17.2 percent of sales were to the U.S. market and 44.6 percent of sales were for markets outside of China in 1998. Of the three manufacturing industry groups for which data were available, Industrial Machinery and Equipment had by far the largest share of sales for non-Chinese markets, with 75.2 percent of all sales to customers outside of China and 34.3 percent of sales in the U.S. market. Electronic and Electrical Equipment more closely reflected manufacturing as a whole, with 18.3 percent of sales to the U.S. and 52.2 percent of sales outside China. In contrast, less than 1 percent of sales by U.S. affiliates in China in the Chemical and Allied Products group were made up of sales to the United States; almost nine-tenths of sales in this industry group were in the local Chinese market.

The presence of U.S. multinational firms in foreign countries can affect the growth of both U.S. exports and imports. In the case of exports, these may increase due to the tendency of U.S. multinational firms to ship U.S. goods abroad to be used as inputs in their foreign production activities. U.S. multinationals may help expand American exports by helping to establish a supportive financial, distribution and marketing infrastructure abroad for U.S. goods in foreign countries. On the other hand, production by U.S. multinational firms in a foreign country may displace U.S. exports to that country. This may occur because local production

eliminates large transport and other costs that may be attached to selling U.S. goods at a distance, or because local labor or other factor costs may be lower than in the United States.

Imports to the U.S. may increase as U.S. multinational firms expand abroad and connect their production in foreign countries to their established marketing, distribution, and production networks back in the United States. The ability to make use of less expensive labor and other inputs abroad may encourage U.S. firms to replace their domestic production for the U.S. market with export production from expanded operations in a foreign country. Also, foreign affiliates of U.S. firms may contribute to the growth and competitiveness of foreign export sectors by spreading knowledge of production technologies; by building financial, marketing, and distribution infrastructure; and by helping to establish a network of intermediary merchants and trading companies. In this way, the growth of U.S. multinationals abroad may promote the expansion of U.S. imports from increasingly competitive and growing export industries in emerging economies. Clearly U.S. multinationals in China may affect U.S.-China trade flows; however, because there are a number of channels by which trade is impacted by U.S. FDI, the magnitude and direction of change for U.S.-China trade flows is not immediately evident.[49]

During the debate surrounding the PNTR vote in Congress, many observers made claims on either side of the question of whether U.S. multinational firms in China were producing for the domestic Chinese market or the U.S. market back home (thus further worsening the U.S. trade deficit and possibly displacing American jobs). Given the data currently available, however, it is difficult to find the direct evidence needed to link foreign direct investment by U.S. firms with either U.S. imports or exports. Table 16, discussed above, provides some

[49] See Lipsey 2000 for a discussion of the role of U.S. multinational firms in U.S. trade with countries of Southeast Asia.

indication of the use of China as an export platform for U.S. multinational firms. Another source of data is a 1998 survey of foreign firms located in Guangdong province, China, which found that the 50 U.S.-owned firms surveyed had exported 27 percent of their output on average. [50] These results also lend support to the view that a significant number of U.S. firms in China focus on producing for export markets. It should also be noted, however, that U.S. firms in this survey were seen to devote a higher share of their Chinese affiliate production to the domestic Chinese market than Chinese affiliates owned by firms based in Hong Kong, Taiwan, or Japan. The U.S. firms, then, while producing a substantial share for export, appear to occupy a middle position between Hong Kong, Taiwan, and Japan, who seem to produce primarily for export, and European firms, which are primarily producing for the domestic Chinese market. Unfortunately, it is difficult to find surveys of this sort that identify the destination of goods produced in China by U.S. multinationals. Fortunately, as we discussed earlier in this report, the media tracking data allow us to track the kinds of industries and products that are shifting production and investment from the U.S. to China and assess the markets they serve. Findings from the media tracking data suggest that a significant number of the U.S.-based firms that are making large investments in China, including such companies as Mattel, du Pont, Motorola, Rubbermaid, and K2, are producing in China for export to the U.S.

Because direct evidence of the relationship between FDI and trade is currently hard to come by, we turn instead to the more indirect approach provided by econometric regression analysis. In this approach, we use statistical techniques to find a significant correlation between changes in trade flows and changes in U.S. foreign direct investment in China. While we

[50] Liu Minquan and Xu Luodan 2001. "Foreign Direct Investment and Linkages: Some Survey Findings from Guangdong China." Working Paper, Zhongshan University.

attempt to control for as many factors as possible, econometric analysis is always limited by the quality of the statistical data available and of the model utilized by the researcher. In addition, even when a significant statistical correlation is found between two variables (i.e., FDI and exports), the direction of causation and the possibility of mutual causation from a third factor still remain open questions. In this preliminary research, we present a relatively simple regression analysis using the official U.S. trade and investment data at hand to provide a first look at the link between U.S. foreign direct investment in China and trade.

Our regression analysis explores the relationship between U.S. foreign direct investment in China and U.S.-China trade in the period from 1994 to 1999 (See Appendix 3 for a description of the regression methodology and detailed results.) Controlling for changes in the real exchange rate, the size of the U.S. and Chinese economies, and industry group, we look for the effect of a 10 percent rise in U.S. foreign direct investment in China on the levels of U.S. imports and exports. The regression results indicate that the level of U.S. imports from China rise by about 6.3 percent with a 10 percent increase in U.S. FDI in China, while the level of U.S. exports to China are not affected. The 6.3 percent increase in U.S. imports represents a sizeable increase in U.S. imports from China in the context of large Chinese exports to the U.S. (growing from $45 billion to $100 billion annually by official U.S. figures since 1995) and rapidly growing U.S. FDI in China in recent years. Our preliminary regression analysis, then, suggests that the surge of activity by U.S. multinationals in China in recent years has increased the sale of goods back to the United States while not promoting much exporting of U.S. goods to China.

Another channel through which U.S. foreign direct investment in China can impact the U.S. economy, and manufacturing employment in particular, is by creating a credible "threat effect" of capital mobility in bargaining between employers and workers. Employers' threats to

relocate plants, to outsource portions of their operations, or to purchase intermediate goods from foreign producers can have a substantial impact on the bargaining position of workers. In Bronfenbrenner's study of union organizing drives in 1998-1999, it was found that more than 50 percent of all employers, and 70 percent of employers in manufacturing industries, made threats to close all or part of their plants to discourage union membership (Bronfenbrenner 2000). Another 18 percent of all employers and employers in manufacturing industries continued to make threats of plant closure during the first contract campaign after the election was won (Bronfenbrenner 2001.) In the context of the surge of U.S. FDI into low-wage countries like China, it is possible that that the pervasiveness of employer threats to close or relocate plants may have a greater impact on real wage growth for manufacturing workers than actual import competition. Our knowledge of these potentially large threat effects is limited and much more research is needed to understand the connections between the emerging U.S.-China economic relationship and U.S. employment and wages.

PART V: CONCLUSION

Integrating the Macro and Micro Data: The Impact of China Trade and Investment on Workers, Wages, and Employment

In combination our findings from the media-tracking and macroeconomic data suggest a world economy where production, trade, capital, and investment are constantly shifting at an ever more rapid pace and where foreign direct investment, international trade, wages, and employment, in the U.S. and around the globe, all appear to be linked together in a complex web of interacting trade and investment relationships world wide.

Even in the short seven-month time span in which we focused our media-tracking research, we watched entire industries shift production from one country to another. In North Carolina, textile manufacturers such as Guilford Mills, Cone Mills, WestPoint Stevens, and Burlington Industries continued the wave of plant closings and production shifts to Mexico that had started to escalate, with the arrival of NAFTA, more than seven years before. Some companies, such as WestPoint Stevens, simultaneously shifted production from North Carolina to Mexico and China. Meanwhile, large textile manufacturers in Taiwan, Korea, and Japan, moved their production facilities into China.

Major U.S. toy producers such as Mattel, Hasbro, and Ohio Arts (Etch-a-Sketch) moved production into China as well. Some toy producers, such as Ertl, shifted away from plants in Mexico where production had moved just a short time before. Large U.S.-based automobile, auto parts, aerospace, and appliance manufacturers such as Lockheed Martin, General Motors, Navistar, Chrysler, Tower Automotive, Delphi Packard, and General Electric continued to shift production from the U.S. to Mexico, while other multinationals in those industries including Sanyo, Dana Corporation, Mazda, Ichitan, Sanmex, Honda, and Hyundai shifted production from Asia and Latin America to China.

The most dramatic examples of these large production shifts from the U.S. to Asia and Latin America, and from Asia and Latin America to China, were reserved for the electronics, electrical equipment, and information technology industries. As we described earlier, in a few short months, the big three cell phone manufacturers, Nokia, Ericsson, and Motorola, moved operations first out of the U.S. to Mexico, Singapore, and Malaysia and then outsourced almost all of their production to China. Meanwhile, during this same time period, more than one

hundred laptop, cell phone, personal computer (pc), and other electronics and information technology producers moved from Taiwan, Japan, and other Asian countries to China.

If we look at the macroeconomic data we find that the industries that were experiencing these global production shifts are the same industries where we have seen the most dramatic changes in trade and investment in the last decade between the U.S. and China and the U.S and the world.

Table 17: Trade balance (exports – imports) between USA and China (in US$1,000,000)

	Year		
Industry	**1990**	**1995**	**2000**
Aerospace	730	1,150	1,655
Apparel	-3,157	-4,638	-6,188
Auto parts	-5	-105	-323
Autos and trucks	35	104	49
Electronics and electrical equipment	-1,641	-6,537	-16,959
Household goods	-448	-1,029	-2,425
Iron & steel	-202	-504	-1,924
Machinery	387	-1,429	-10,295
Major appliances	Na	-1,732*	-3,049
Petro-chemicals	-635	-309	-108
Plastics	-222	-1,285	-2,191
Textiles	-216	-71	-1,574
Tires	/	-71	-288
Toys and sporting goods	-2,132	-6,143	-12,354
Wood & paper products	107	-375	-1,187

*Notes: na indicates not available; / indicates less than US$1,000,000; * indicates measure taken in 1997.*
Source: Authors' calculations based on U.S. International Trade Commission trade data. All industries use HTS categories, with three exceptions: household goods and petrochemicals are SIC categories, and major appliances is an NAICS category.

As we can see from Table 17, U.S.-China trade deficits have increased in almost every industry since 1990 with the exception of aerospace, where as of 2000 the U.S. has a trade surplus of $1.7 billion. The trade deficit is highest ($17 billion), and increasing the fastest, in electronics and electrical equipment, the industry where we found the greatest number of U.S.-China production shifts and the industry where we found the largest level of FDI in China by U.S. firms. We also find high (and rapidly increasing) levels of trade deficits in other industries where U.S.-China production shifts were concentrated including, textile/apparel, toys and sporting goods, household goods, and wood and paper products.

When the findings from the macro trade data are coupled with the findings from the media-tracking data we also see more clearly the relationship between increases in FDI, increases in trade deficits, and employment effects. The industries that have experienced the greatest increase in FDI from U.S. multinationals into China, including electronics and electrical

equipment, machinery, and other manufacturing (such as toys, sporting goods, and household goods), are all industries that have experienced rapidly increasing trade deficits, and are also the industries where we have found high levels of production shifts from the U.S. to China. This is further supported by the findings of our regression analysis on the impact of FDI on trade, which suggests that for every 10 percent increase in U.S. FDI in China there was a 6.3 percent increase in the level of imports from China to the U.S., with no statistically significant effect on the level of exports from the U.S. to China.

According to our media-tracking data, over the seven month period of our study, more than 22,000 jobs were reported to have been lost from production shifts in U.S. firms in the electronics and electrical equipment industries, while more than 3,000 jobs were reported lost through production shifts in toys, household goods, and sporting goods, and more than 1,300 jobs were reported lost in apparel and textile. As we explained earlier, because our media-tracking sources were limited to those stories of production shifts that were reported in the major media, we estimate that those numbers capture fewer than half of the actual jobs lost in those industries. We would therefore estimate that the actual number of jobs lost each year from production shifts to China total between 80,000 and 100,000 jobs, which, when compounded over eight years (with the expectation that the number increases each year as production shifts and trade deficits increase) is very close to our preliminary estimate of the total jobs lost due to increased trade deficits between 1992 and 2000 (760,000).

The media-tracking data also clarify some misconceptions about kinds of jobs being lost in production shifts to China and other countries. Where at one time the majority of production shifts into China may have been concentrated in relatively low-skill, low-wage jobs in light manufacturing industries such as apparel and textile, our media-tracking data paint a much more

complex picture of the work that is leaving the U.S. to go to China today. Just as our macroeconomic findings found that U.S. firms are increasingly investing in more complex, higher end industries in China (including petrochemicals, machinery, finance, metals, and electronics and electrical equipment), our media-tracking data suggest that an increasing percentage of the jobs leaving the U.S. are in higher-paying industries producing goods such as bicycles, furniture, motors, compressors, generators, fiber optics, clocks, injection molding, and computer components. As we found in our media-tracking data, it is these higher end jobs that are most likely to be unionized, and therefore more likely to have a much larger wage and benefit package. These are also the jobs more likely to be held by high seniority, top-of-the-pay-scale employees, who have the most to lose when production shifts and plants close down.

Nor is the impact of these production shifts limited to the workers whose jobs have actually been moved out of the country. Each time a company shuts down operations and moves work to China, Mexico, or any other country it has a ripple effect on the wages of every other worker in that industry and that community. Each plant that closes, each job that is shifted overseas, fosters an overriding sense of insecurity about their economic future which serves to constrain demands for wages increases, inhibit workers "quitting power," and intimidate them from exercising their right to organize (Bronfenbrenner 2000; 2001).

The multiplier effect of job loss due to plant closings goes beyond lowering wage demands and restraining union organizing and bargaining power. As described in a recent study by the Chicago-based Center for Labor and Community Based Research, plant closings and production shifts also have a multiplier effect on related contracting, transportation, wholesale trade, professional, and service-sector employment in companies and businesses that serviced and supplied the workers in the company that shut down (*PR Newswire* 2001). According to the

study, in the two years following factory closings at International Paper and Rohm and Haas facilities in Pascagoula Mississippi, the community could expect to lose as much as $17,548 per worker from lost tax and social security revenues and additional unemployment compensation costs. In addition, for the 750 jobs lost in the plants, the towns could expect to lose another 433 jobs in the community, shrinking the average salary in the town by as much as 21 percent in the first year after the plant closings alone.

As our media-tracking data make clear, trade and investment with China is just one of the multiple sources of employment and wage effects from U.S. trade and investment policies and practices worldwide. Based on our media-tracking data, along with Robert Scott's research on the employment effects of NAFTA, we estimate that just as many, if not more, jobs are being lost each year to Mexico as are to China (Scott et al 2001). Although our media sources were much more limited, we also found a significant number of jobs being lost in production shifts from the U.S. to other Asian and Latin American countries. This all occurs prior to passage of the Free Trade Agreement of the Americas (FTAA), which, if it passes, will, like NAFTA, contribute to a dramatic rise in production shifts and threats of production shifts to other Caribbean, Latin American, and South American countries.

The wage and employment effects of U.S.-China trade relations are not felt in the U.S. alone. What our research has shown is a massive shifting of employment around the world, with losses equally, if not more, devastating in those countries as well. What we have not found in the aftermath of rapid increases in global trade and investment is any rising tide of wage and employment improvements lifting workers world wide to a higher standard of living. That certainly has not been the experience of workers in Singapore, Taiwan, or Malaysia who are witnessing hundreds of thousands of some of the best jobs in those economies moving to China

and other lower wage countries. Nor has it been the experience of Mexican workers, who, seven years after NAFTA was passed, face a decline in real wages, staggering income inequality, and more limited access to better paying jobs. As Carlos Salas explained in a recent report to the Economic Policy Institute

> While NAFTA has benefited a few sectors of the economy, mostly maquiladora industries and the very wealthy, it has also increased inequality and reduced incomes and job quality for the vast majority of workers in Mexico. In many ways (such as the stagnation of the manufacturing share of employment), the entire process of development has been halted, and in some cases even may have been reversed (Scott et al. 2001:7).

There is in fact much to be learned from the U.S.-NAFTA experience for those concerned about the impact of U.S.-China trade relations on U.S. trade and employment. As has happened in just the few months since President Clinton signed PNTR legislation into law, immediately after NAFTA went into effect in 1994 the U.S. witnessed an escalation in production shifts to Mexico that has continued to this day. Coupled with these production shifts has been a dramatic increase in threats of plant closing, particularly during union organizing and bargaining campaigns (Bronfenbrenner 2000; 2001). NAFTA has not delivered on the promise of wage prosperity and better-paying export-related employment opportunities for workers in any of the three countries -- the U.S., Canada, or Mexico (Scott et al. 2001).

Some analysts and lawmakers deny that our trade policy has had a negative impact on U.S. workers jobs and wages. When La Crosse Footwear, a company that has been producing shoes and boots in northern Wisconsin for over one hundred years, announced last October that it was laying off 200 workers, La Crosse native U.S. Rep. Ron Kind (D), who had voted in favor of PNTR, argued, “There's absolutely no correlation between the China bill and what happened

at La Crosse Footwear" (*Associated Press* 2000a: a10). The US-China Business Council (2000:1) agrees, noting that "No matter the number, union projections of job losses are baseless." But the results of our media tracking, backed by the macro data analysis, suggest that the timing of trade agreements such as PNTR and announcements of plant closings and production shifts are more than coincidence. Employer after employer tells how the lure of cheap labor overseas is, in the end, too hard to resist. As La Crosse Footwear president Joseph P. Schneider wrote in a letter to workers, "Due changing conditions in the marketplace, the long-term outlook for domestic manufacturing of footwear is becoming less and less optimistic" (*Associated Press* 2000a: a10).

While trade advocates argue that increased trade will provide across the board benefits for U.S. companies, many employers seem to feel otherwise, and comment on how they feel trapped by the changing trade environment. James Cowan, president of a textile company in North Carolina, remarked pessimistically that watching the movement of manufacturing overseas made him feel like "the canary in the mine shaft" (Cannon 2001:A1). Pencil-slat producer Charles Berolzheimer II, announced that his company, Cal Cedar, had no choice but to move jobs to China. Berolzheimer told reporters that because Chinese labor costs were 50 to 80 times less than in the United States, Cal Cedar had to move. While Cal Cedar employees in California might be paid about $80 per day, the company was paying its Chinese workers less than that amount, with benefits, per month. "That's what we are having to compete against," Berolzheimer said. "We have to do it. If we don't, we'll be out of business" (Spence 2001:1).

Implications of Research Findings for Government Data Collection

As we have described above, our findings from both the macro data analysis and the media tracking provide further evidence that U.S.-China trade and investment policies have had, and will continue to have, significant impact on employment and wages in both the U.S. and other countries actively involved in a trade and/or investment relationship with China. However, because this paper's exploration of the effects of U.S.-China trade on the American economy is still preliminary, we will focus our primary policy recommendations on the need for better data collection on the activities of U.S. firms abroad, the measurement of U.S. trade and investment flows, and the impact of those trade and investment flows on workers, unions, families, and communities in the U.S. and around the globe.

As we mentioned in our introduction, at this time no government body in the U.S. has had the responsibility for collecting comprehensive national data on the wage and employment effects of trade agreements and policies. Thus, with the exception of the media-tracking system we established for this pilot study, we have no systematic way of monitoring the economic impact of expanding trade and economic ties with China, and no way of tracking which companies in which industries are shifting production to China and the workers, jobs, and communities impacted by those production shifts.

The federal government has several policies in place to assist workers impacted by trade. Employers with 100 or more employees are required to notify their employees of plant closings under the Worker Adjustment and Retraining Notification Act of 1988. The Trade Adjustment Assistance program assists workers who have lost their jobs as a result of increased imports, and the North American Free Trade Agreement-Transitional Adjustment Assistance assists those workers who have become unemployed due to imports specifically from Canada and/or Mexico,

or a shift in production to Canada and/or Mexico. However, there is no federally mandated corporate reporting program that collects data on production, employment, and investment shifts by U.S. corporations.

We believe that the research findings summarized in this report argue for government-mandated reporting systems that require U.S. corporations to both report on any production shifts to foreign countries (including the company name, parent company name, industry, product, number of jobs lost from the location where the work originated and the company name, parent company name, country, city, and state or region where the production is being shifted to) and accurately report on the source country, company, and dollar value, for all goods coming into the U.S. from other countries and all goods leaving the U.S. to go to other countries.[51]

We undertook this research fully cognizant of the serious insufficiencies inherent in using media sources to reliably and comprehensively track national and international investment and employment trends. However, absent any current legislative initiative to mandate corporate reporting of full or partial production and employment shifts out of the U.S., we see this media-tracking system as the best available and most practicable alternative to a government-mandated and supervised reporting system.

Despite the challenges, this pilot study has given us a clear understanding of just how valuable an ongoing media-tracking system such as this could be for scholars, practitioners, and policy makers interested in the impact of trade policies on workers, their families, and their communities in this country and around the globe. The database not only provides important insights into the nature and extent of the companies that are moving, the number of jobs being

[51] This could be accomplished by a simple computer scannable tracking form attached to all imports into and all exports out of the U.S.

lost, and the industries and occupations in which the production shifts are concentrated; it also gives us a baseline to monitor future trends in global trade and investment and the impacts of changes in trade and investment policies and practices such as PNTR. Most important, absent government-mandated corporate reporting of production shifts and foreign direct investment, this database is the only extant source of comprehensive data on the impact of China trade policy on jobs, workers, and communities in the U.S., and the only source to inform the current debate on macro measures of trade and investment.

Until such a mandatory corporate reporting system is in place we believe it is imperative that the U.S. government continue to fund the development and maintenance of a media-tracking system for monitoring production and investment shifts out of the U.S. At this point it is our only source of information on the massive hemorrhaging of jobs occurring in our manufacturing sector; one that impacts on the lives and livelihoods of millions of U.S. workers and their families and communities. Regardless of political perspective on investment and trade with China, our public policy cannot move forward without systematic data on which to base these policy decisions. At this time media tracking is one of the few available sources for systematic data collection on China trade and investment effects. We have laid the groundwork for such a tracking system in this pilot study, but its ongoing funding and maintenance is required if we are going to maintain this essential tool for tracking the impact of trade and investment on the U.S. economy.

In addition to the establishment of a corporate reporting system, and the maintenance of the media-tracking system, we urge the federal government to consider improving its data collection on foreign direct investment. The International Investment Division of the U.S. Bureau of Economic Analysis makes available an impressive range of data on the foreign

operations of U.S. firms. However, to allow researchers and policy makers to better evaluate the impacts of international economic relations with China (and other countries), more detailed data on U.S. foreign direct investment is required. We draw attention in particular to these areas:

- Greater disaggregation of the industry/country breakdown of data is needed to allow researchers to better analyze the character and dynamics of international production for multinational firms. Areas in which it would be valuable to provide more disaggregated data include the trade activities of U.S. multinationals, the location and composition of foreign investment, the composition of foreign and domestic employment, differences in foreign and domestic productivity for U.S. firms, and foreign affiliate balance sheet information.

- Better information on the international subcontracting arrangements of U.S. firms is essential to attaining a clear picture of the process of economic internationalization and to understanding its impacts on the U.S. economy.

- The research value of the data on the operations of U.S. multinational firms provided by the BEA is limited by the suppression of data imposed to maintain a high level of confidentiality for reporting firms. The procedures used to assure confidentiality should be reviewed and changed to reduce the suppression of information and raise the value of the BEA data for researchers.

- Finally, the collection of broader and more disaggregated data on the technology practices (R&D expenditures, IT expenditures, computer and telecommunications use, etc.) of U.S. multinational firms is needed to allow a clearer assessment of the character and dynamics of international production by U.S. firms.

Several revisions in the U.S. trade data would allow a more accurate picture of the trade relationship with China. As discussed earlier, there are serious questions about how much the U.S. data on the bilateral U.S.-China trade deficit over- or under-estimate trade flows with China. In order to more accurately measure U.S.-China trade flows, the following changes are recommended:

- Accurately tracking the correct country of origin for trade flows. In particular this requires both careful monitoring and tracking of false invoicing and transshipments and developing techniques to measure export price markups by intermediaries in third countries. If reliable estimates regarding the value of transshipments and re-markups are attainable, they should be used to readjust import and export calculations.

- Accurately tracking the value of imports by switching from a c.i.f. (cost, insurance and freight) basis to an f.o.b. (free on board) basis.

Proposal for Future Research

If we are truly going to understand the impact of trade policies on employment, workers, wages, and communities, it is essential that we find a way to monitor and track changes in employment and investment that occur in the aftermath of PNTR and other trade agreements. We believe that the research summarized in this report lays the groundwork for continued analysis of the impact of the U.S.-China trade and investment relationship on the American economy. In the next stages of research, we plan to build on this preliminary research to conduct a more comprehensive analysis exploring the effects of the U.S.-China trade and investment relationship on U.S. employment and wages. The following section provides a brief outline of our proposal to the U.S.-China Security Commission to conduct future research in this area:

<u>Impact of U.S.-China trade and production shifts on employers, workers and communities</u>

- *Continuation and expansion of the media-tracking database.* Absent government-mandated reporting requirements for production and investment shifts out of the U.S., the media-tracking system will continue to be the only extant data source for in-depth national data on the nature and impact of production shifts out of the U.S. and into China. We propose to continue the media tracking of all production shifts out of the U.S. into China, Mexico, and other Latin American and Asian countries, expanding our sources to include more local and regional media. In addition, we propose to expand our tracking of production shifts into China to include additional English-language media sources for production shifts from additional Asian and Latin American countries into China, along with production shifts from China's leading European trading partners.

- *Firm survey of wage and employment effects.* In order to get the in-depth data that are not yet available through government sources, we intend to conduct surveys of managers in union and non-union firms with a direct or indirect trade, investment, or production relationship with China. Although firm surveys face the challenge of getting a suitable response rate, we believe this method is the only option available at this time to learn from employers about their decisions to produce in China and the resultant impact on their U.S.

workforce. Survey data will be supplemented with information on corporate ownership and financial condition collected from online databases.

- *Union bargaining survey focusing on wage and employment effects of China trade and investment in unionized firms.* To triangulate data collected from the firm survey and through available macro data, we plan to survey union representatives to assess the impact of PNTR on U.S. workers and unions. Data will be collected through both mail and phone surveys of union representatives and will include questions about pre-bargaining wages, benefits, employment, and work systems; the contextual bargaining environment; union, company, and bargaining unit characteristics; bargaining history and process; union and employer bargaining tactics; threats of job loss and actual job loss during or in the aftermath of the bargaining process; and wage, benefit, and employment outcomes from bargaining. In addition, information on corporate structure and ownership, foreign direct investment, and company financial condition will be collected from online databases and library research for each of the bargaining units in our sample.

- *Qualitative ethnographic study of workers, unions, firms, and communities impacted by China trade.* To get a more complete understanding of the impact of the China trade bill on wages and employment, the final phase of the project would involve five in-depth ethnographic case studies of workplaces and communities where U.S.-China trade has had a significant effect on wages and employment. Our preliminary research shows that particular regions of the country have been more impacted by production shifts to China, such as southern California, western North Carolina, and Texas. We intend to send a team of researchers to conduct on-site interviews with a cross section of those most impacted by these changes, including workers, employers, union representatives, and community leaders. Information collected in these in-depth studies will serve to greatly inform and enrich our understanding of the dynamics and subtleties of the impact that trade and investment policies can have on workers, families, and communities.

<u>Further tracking and analysis of macro trade, investment, employment, and wage data</u>

- *Estimate the employment and wage effects of U.S. trade with China using a factor content analysis of U.S.-China trade.* Combining industry-level U.S.-China trade data with industry input-output data and estimates of labor demand elasticities, U.S. employment and wage effects will be calculated for recent years. To attain an accurate range of estimates for employment changes and wage, we will adjust for problems with official trade data and account for changing U.S. trade patterns in recent years.

- *Explain the relationship between U.S. foreign direct investment and U.S. trade with China.* We will compile data on the trade activities of foreign affiliates of U.S. firms in China using BEA data on the foreign operations of U.S. multinational firms. A thorough regression analysis of the impact of U.S. investment in China on total U.S. export and import flows with China will be undertaken. This analysis will focus on uncovering the role of U.S. foreign direct investment in developing the capacity and infrastructure in China to support a growth

in either U.S. exports to China or U.S. imports from that country. For both of these projects, a request for a special compilation of BEA data on the operations of U.S. multinational firms will be made to overcome some of the data limitations of the publicly available data.

- *Compare U.S. economic relationship with China to U.S. relationship with other Asian developing countries.* Compare U.S. trade and investment patterns with China to those of other Asian developing countries to highlight differences and similarities in market access, trade strategies, and the behavior of U.S. multinational firms in China and other countries.

- *Compare Chinese economic relationship with the United States with other industrialized countries.* Compare China's trade and investment patterns with the U.S. to those with Europe and Japan to highlight differences and similarities in market access, trade strategies, and the treatment of foreign investment in the U.S., Europe and Japan.

- *Forecast the future effects of US-China trade on U.S. economy under different scenarios.* Making use of the research results attained, develop a forecasting model that allows a range of potential effects on U.S. employment and wages from the economic relationship with China given different policy and economic scenarios.

Conclusion

In closing, it is important that we remember that trade policies such as PNTR have had a much broader ripple effect on workers and communities than simply lost jobs and closed plants. Yes, many Americans are doing better economically than in the recent past. Yet, in the context of corporate mergers, leveraged buyouts, contracting out, and capital flight, there remains a great sense of economic insecurity among American workers today that has been only heightened by the recent downturn in U.S. economic indicators. Our media research captures one major source of that economic insecurity and the harsh economic reality that it represents – the hundreds of media stories that come out each week in our nation’s newspapers and magazines reporting on plants that have closed and work that has moved to China, Mexico and around the globe and the tens of thousands of manufacturing and export related jobs that are lost.

The U.S. and other nations have embarked on a quest for global economic integration that is filled with the promise of worldwide improvements in standards of living. Much, too, has been promised about the impact of new U.S. trade relations with China, including U.S. job creation to meet an expanding export market, access to lower-priced imports for U.S. consumers, and, for Chinese workers, the promise that free markets will not only result in dramatic improvements in their standard of living, but political and social freedoms as well. But the promises of economic and social benefits of global economic integration have yet to be fulfilled in Mexico, in China, or in any other part of the world. As Dani Rodrik argues, the "utopian vision of prosperity that developing countries will reap if they open their borders to commerce and capital" is a hollow promise that "diverts poor nations attention and resources from the key domestic innovations needed to spur economic growth" (Rodrik 2001: 55).

That is not to say that there have not been those who have benefited from global integration. As our media-tracking data showed again and again, multinational corporations, many of them U.S. based, are winning the race to the bottom that worldwide production shifts represent. Money saved by cutting labor costs and outsourcing production has resulted in enormous profit margins and even just the announcement of a planned production shift to China, Mexico, or other countries can cause stock prices to soar.

The question remains, for our nation and the world, whether policies that benefit so few at the expense of so many are worth the costs in lost jobs, devastated communities, and broken dreams -- or, whether we can develop alternative policies that expand economic opportunity for the many, while protecting labor, social, environmental rights, not just in one country but around the globe. What our research shows is that the U.S. and other countries have moved ahead with trade policies and global economic integration based on faulty arguments and incomplete

information. We believe that this pilot study is a first step in informing that process, and urge the U.S. government to more carefully analyze the full costs and benefits of trade policy with China and other nations before it moves forward.

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PART VII: APPENDICES

Appendix 1: Industry Tables for the Media-tracking Data

Table A1a: Proportion of production shifts by industrial sector out of the U.S: October 1, 2000 - April 30, 2001

Industrial Sector	China	Other Asian	Mexico	Other LA
Aerospace	--	--	.01	--
Apparel	--	--	.06	.20
Appliances	.02	--	.03	--
Automobiles	--	--	.04	--
Auto Parts	.01	--	.10	--
Call Centers/Banking Services	.01	--	--	--
Chemicals	.17	.03	.12	--
Electronics and Electrical Equipment	.37	.65	.28	.47
Fabricated Metal	--	--	.03	--
Footwear	.01	.10	--	--
Household Goods	.11	.05	.09	.27
Machinery	–	.03	.03	–
Plastics	.06	.08	.07	.07
Sporting Goods	.05	.03	.01	--
Textiles	.06	--	.08	--
Toys	.08	.03	.01	--
Wood and Paper Products	.05	.03	.04	--

Table A1b: Proportion of production shifts by industrial sector from Asian countries and Mexico to China: October 1, 2000 - April 30, 2001

Industrial Sector	Taiwan	Korea	Japan	Other Asian countries	Mexico
Aerospace	--	--	--	--	--
Apparel	.02	--	.15	--	--
Appliances	.08	--	--	--	.14
Automobiles	--	.10	.03	--	--
Auto Parts	--	--	.04	--	--
Call Centers/Banking Services	--	--	.01	.12	--
Chemicals	.03	.10	.03	.04	.14
Electronics and Electrical Equipment	.67	.55	.52	.77	.57
Fabricated Metal	.02	.10	--	--	--
Footwear	--	--	--	--	--
Household Goods	.02	.--	.04	--	--
Machinery	--	.05	.06	.04	--
Plastics	.03	--	.01	.04	--
Sporting Goods	--	--	.01	--	--
Textiles	.13	.10	.07	--	--
Toys	--	--	.01	--	.14
Wood and Paper Products	--	--	--	--	--7

Appendix 2: A Brief Review of Research on Trade's Effect on Employment

The two most popular frameworks used by economists for evaluating the impact of increased trade on employment are the product price approach and the factor content approach. The product price studies are based on the Heckscher-Ohlin model of international trade, which offers testable implications for the effects of increased trade on the prices of goods and the wages of workers in the economy.[52] The main claim of the Hecksher-Ohlin model is that countries will tend to concentrate on producing (and exporting) goods that use the factors that the country possesses in abundance compared to its trading partners. The country will import goods that use the factors that it possesses in relatively less abundance. For the United States, the Hecksher-Ohlin model implies that export goods will be produced by intensely using more skilled labor and import goods will be produced using less skilled labor. Studies of the factor content of U.S. goods confirm that import-intensive industries employ proportionately more lower-skilled workers relative to export-intensive industries.[53]

The price product studies rely on one of the relationships that follow from the Hecksher-Ohlin model – that for an industrialized country an increased openness to world trade causes an unambiguous reduction in the real wage of less skilled workers.[54] This reduction in the wages of less skilled workers in industrialized countries results from falling prices for goods produced with a high proportion of less skilled labor as trade becomes freer. Prices for these goods fall in industrialized countries as trade expands because of rising import competition from production in

[52] The Heckscher-Ohlin model of international trade is named for two Swedish economists and is perhaps the most prominent economic model of trade.

[53] See Krugman and Obstfeld (1999) for a textbook presentation of the Heckscher-Ohlin model of international trade.

[54] This result draws on the Stolper-Samuelson theorem which states that a decrease in the price of a good will lower the prices (wages) of factors (workers) which are used relatively intensely in the production of that good.

developing countries with large pools of low paid, less skilled workers. One of the testable implications of these assumptions is that, for trade to have caused the fall in relative wages for less skilled workers, we should observe a fall in the relative prices of the goods produced relatively intensely with less skilled labor. A second testable implication of this model of trade is that the production of all goods should become more intensive in the use of less skilled workers (that is, increase the ratio of less skilled to more skilled workers). This is because all sectors should substitute away from relatively expensive factors of production and toward the now relatively cheap labor that is less skilled.

The evidence from studies using the product price approach has been mixed in regard to the key question of whether increased international integration is a major cause of the worsening position of less skilled U.S. workers. Most of the studies following this approach examine whether the prices of less skill-intensive goods have fallen relative to the prices of other goods. Among the studies that have found price changes that are consistent with trade playing a role in depressing wages for less skilled workers are Sachs and Schatz (1998) and Leamer (1993, 1998). Studies finding that product price changes do not support a large role for trade in lowering the wages of the less skilled are Bhagwati and Dehijia (1994), Lawrence and Slaughter (1993), Krugman and Lawrence (1994), and Sachs and Schatz (1994). Several studies have examined evidence to determine if U.S. producers have come to use less skilled workers more intensely as the Hecksher-Ohlin model implies would occur if trade was putting downward pressure on the wages of less skilled U.S. workers (Berman, Bound and Griliches 1994; Lawrence 1996). These studies have generally concluded that the opposite has happened: U.S. producers seem to be increasingly shifting toward making use of more skill-intensive labor.

The factor content approach to evaluating the effects of trade on employment and wages draws on a straightforward framework of relative supply and demand in the labor market. In this approach, changes in trade levels imply shifts in relative labor supply that then determine wage levels in the economy. An increase in U.S. imports of goods produced using relatively high amounts of less skilled labor is seen as effectively raising the relative supply of less skilled workers used to produce goods for use in the U.S. economy. That is, imported goods are thought of as embodying the foreign workers and other factors used to produce them. Likewise, U.S. exports are thought of as embodying the American workers and other factors used in their production. An increase in exports produced using relatively high levels of more skilled workers, then, is seen as effectively reducing the domestic supply of these workers to produce goods for use in the U.S. economy.

Carrying out factor content analysis requires two steps. First, the shift in the effective relative supply of labor must be estimated. Most researchers use some measure of the amounts of less skilled and more skilled labor used by producers in U.S. manufacturing industries to estimate the quantity of each type of labor embodied in trade flows. The pattern of changes in trade across industries then determines the changes in the effective relative supply of workers. The second step is to use some measure of the sensitivity of wages to changes in effective relative supply in the labor market (what economists refer to as the wage 'elasticity'). Dividing the estimated trade-induced change in the effective relative supply of workers by the estimated elasticity yields an estimate of the relative wage change. Clearly, the estimated size of trade-induced wage effects arrived at using this methodology depends very much on the assumptions used by the researcher concerning the amount of labor embodied in exports and imports and the sensitivity of relative wage levels to shifts in the relative effective supply of labor. Studies

utilizing the factor content method that have found trade to play a modest role in the falling relative wages of less skilled workers include Borjas, Freeman and Katz (1997) and Sachs and Schatz (1998). In contrast, Wood (1994, 1995) finds changes in trade accounting for all of the fall in the relative wages of less skilled U.S. workers. He presents a factor content analysis that utilizes a high estimate of embodied labor in U.S. imports as well as a high estimate for the sensitivity of wages to changes in effective labor supply.

The factor content approach has been incorporated by some researchers into a general equilibrium model in which changes in individual markets are allowed to influence outcomes in other markets in the economy. Krugman (1995) presents such a model and finds that about 10 percent of the increase in the wage gap between less skilled and more skilled workers is due to increases in trade with developing countries. Overall, studies of the effect of rising trade openness on wages have clustered around finding trade accountable for about 15 percent to 25 percent of the increase in the wage gap between less skilled and more skilled workers in recent decades.[55]

[55] See Cline (1997) for a review of studies on the effect of international integration on the U.S. income distribution.

Appendix 3: Job Loss from U.S.-China Trade

This report makes a preliminary estimate of job loss due to the growing trade deficit with China using a factor content analysis of changes in imports and exports between 1992 and 2000. As described in Appendix 2, factor content analysis assigns a figure for the number of jobs embodied in both imported goods and exported goods to track changes in employment demand as the trade balance changes. In our analysis, we look at the change in the value of exports and imports between the U.S. and China between 1992 and 2000. The increase in U.S. exports to China in that time period is then assigned a figure for jobs created while the increase in U.S. imports from China is assigned a figure for jobs lost. Adding these figures together yields an estimate for the total job gain or loss due to the change in the U.S.-China trade balance. As noted in the report, an estimated job loss due to the growing U.S.-China trade deficit between 1992 and 2000 does not necessarily manifest itself as unemployment or joblessness. In the context of a near full-employment national economy (such as the U.S. economy in 2000), the job loss from trade show itself as a fall in labor demand resulting in lower wage levels for workers.

Using employment requirement tables made available by the U.S. Bureau of Labor Statistics, Scott (2000) estimated the employment supported by $1 billion of exports and the employment displaced by $1 billion of imported goods. The BLS employment requirement tables indicate the direct and indirect employment supported by $1 million of sales and goods to final users for each of 183 industries. Combining the employment requirements and the composition of trade flows with China across the 183 industries allowed Scott to calculate figures for the job content of $1 billion of U.S. exports and $1 billion dollars of U.S. imports in 1999.

In calculating an estimate of job loss due to trade with China, we use the figures provided by Scott for jobs gained due to exports and jobs loss due to imports. However, our analysis makes use of somewhat different figures for U.S. trade with China in arriving at our job loss estimate. First, we extend our analysis to 2000, adding one year to Scott's time period of 1992-99. Ideally, we would recalculate the job changes attached to given values of exports and imports by taking into account any changes in the composition of U.S.-China trade between 1999 and 2000. Also, to more closely follow Scott's methodology, we would deflate the 2000 trade flows in each industry by industry-specific producer price indexes to yield a common constant dollar measure for trade values over the whole 1992-2000 period. However, in this preliminary estimation we have deflated the total export and import values by a common economy-wide U.S. producer price index. Given only a one-year extension in the period examined, however, we believe that significant problems do not arise from assuming a constant composition of U.S.-China trade and using an economy-wide price index.

We also adjust the official U.S. trade data used in the analysis to account for the under-valuation of exports to China in 2000 due to re-exporting through Hong Kong, and the under-valuation of imports from China in 2000 due to transshipments. We draw on the estimates presented in Fung and Lau (1999) for the value of re-exported U.S. goods to China that are miscounted as exports to Hong Kong in official U.S. trade figures. Fung and Lau give an estimate of about $5 billion for these undercounted exports to China for 1998. Based on this figure for 1998, and assuming the same ratio of under-valuation, we estimate the under-valuation of U.S. exports to China in 2000 to be about $5.5 billion (in 2000 dollars). Next, in estimating the under-valuation of U.S. imports we look to estimated values for transshipments of Chinese textiles to the United States of about $2 billion by the U.S. Customs. (Barton, 2000) We

conservatively assume approximately $1.5 billion in additional transshipments of Chinese goods to the United States in industries other than textiles. Taken together, we estimate that transshipments of Chinese goods to the U.S. result in an under-valuation of U.S. imports of $3.5 billion in 2000. Table A:3 below shows our adjusted trade figures and estimated job gains and losses from the change in the trade balance with China between 1992 and 2000.

Table A3: Estimated job loss from growing U.S. trade deficits with China, 1992-2000
(Millions of constant 2000 dollars)

	1992	**2000**	**Change 92-00**	**Jobs lost or gained**
Exports	8,183	21,685	13,502	121,365
Imports	28,378	103,518	75,140	- 879,664
Trade balance	-20,195	-81,833	-61,638	-758,299

Data: U.S. Census Bureau for official U.S. trade data; adjusted by authors.
Factor content of trade (from Scott 2000): $1 billion exports = 8,890 jobs; $1 billion of imports = 11,707 jobs.

Appendix 4: Regression Analysis

This report uses a regression analysis to examine the relationship between the surge of U.S. direct investment into China and the growth of U.S. exports and imports with China in recent years. Export and import equations for China were estimated using standard gravity equations in which U.S. direct investment in China was added as an independent variable. In estimating bilateral trade flows, gravity equations typically include characteristics of each country, the distance between trading partners, other factors that may inhibit or promote trade, and price variables such as exchange rates (Bergstrand 1985). T he method of analysis used here is similar to one developed in Goldberg and Klein (1997) on trade-direct investment linkages between the United States and Japan, on one side, and a number of countries in Asia and Latin America on the other.

The trade and direct investment variables are annual and on the manufacturing industry level; the data include a panel of seven industry groups from 1994 to 1999. The seven manufacturing industry groups are food and kindred products; chemical and allied products; primary and fabricated metals; machinery except electrical; electronic and electrical equipment; transportation equipment; and "Other manufacturing." The six years from 1994 to 1999 were chosen because the U.S. direct investment position in China was not at substantial levels prior to 1994 and the relevant data are not available later than 1999. With seven manufacturing groups and six years, the total possible number of observations is forty-two. However, because nine observations of industry direct investment data are suppressed to maintain firm confidentiality, there are thirty-three observations in the sample.

The model is estimated with fixed effects for each industry group. A fixed-effects model is chosen over a random-effects model because the data represent the universe – not just a sample – of the population (U.S. manufacturing firms investing in China) that we were interested in studying. The equations are log-linear (a standard form for estimating trade equations). Because each variable enters the equation as a logarithm, the estimated coefficients can be interpreted as elasticities.

The export equation is shown below:

$$USEXP_{it} = CONSTANT + INDFIX_i + USDIA_{it} + CGDP_t + RER_t + e_{it},$$

Where $USEXP_{it}$ = U.S. exports to industry i in year t in 1990 dollars;

CONSTANT = constant term;

$INDFIX_i$ = industry intercepts (or dummy);

$USDIA_{it}$ = U.S. direct investment position in industry i in year t in 1990 dollars;

RER_t = the real U.S.-China exchange rate in year t;

[RER = (E x P*)/P where E is the dollar-yuan exchange rate, P* is the consumer price index in China, and P is the consumer price index in the U.S.]

$CGDP_t$ = gross national product for China in year t in 1990 dollars.

And e_{it} = error term for observation I, t.

The import equation is in the same form except that U.S. imports replaces U.S. exports as the dependent variable and U.S. GDP replaces Chinese GDP as an independent variable. The trade data are from the U.S. Census Bureau; the direct investment data are from the U.S. Bureau of Economic Analysis; GDP, exchange rates, and price levels are from the International Monetary Fund.

Table 1 shows the regression results from the two trade equations. The standard gravity model variables (the GNP and real exchange rate variables) are significant in the export equation but not in the import equation. For rapidly growing U.S. imports from China, changes in the volume of imports in recent years is apparently not driven by exchange rate changes or macroeconomic conditions in the U.S. The F-statistics and adjusted-R^2 statistic indicate that the equations have significant explanatory power.

The import equation results in Table A-2 show that a 1% increase in U.S. direct investment into China expands the volume of imports back to the United States by 0.63 percent. On the other hand, the export equation results show that an increase in U.S. direct investment in China has no significant effect on the volume of U.S. exports to China.

The estimation results are consistent with direct investment in China by U.S. firms serving to boost China's exports to the United States while, on net, not affecting the export of goods to China by firms based in the United States.

Table A4: U.S.-China trade equations

	U.S. Imports from China	**U.S. Exports to China**
Constant	8.61 (0.70)	4.68* (1.985)
U.S. FDI position	0.628*** (4.37)	-0.020 (-0.28)
U.S. GDP	-0.500 (-0.35)	-
China GDP	-	0.866** (2.63)
Real exchange rate ($/Yuan)	-0.047 (-0.04)	1.384** (2.49)
Adjusted R^2	0.93	0.92
F statistic	54.75***	44.2***
Number of observations	33	33

t-scores in parentheses
Significance: * 10% level; ** 5% level; *** 1% level