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Offshoring: Challenges and Opportunities for U.S. Manufacturing

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Offshoring: Challenges and Opportunities for U.S. Manufacturing

Executive Summary

Offshoring has become a politically charged term that is associated with, among other things, exporting American jobs, the decline of U.S. manufacturing, and the erosion of household incomes.

The absence of data directly measuring the phenomenon, along with anecdotal evidence of large investments by U.S. firms in China, has fueled a perception that U.S. manufacturing is rapidly losing its competitive edge to countries with labor costs that are a fraction of what they are in the United States. This report draws on a number of data sources that indirectly measure offshoring and concludes that its threat to U.S. economic strength is not as grave as is widely believed, though there are areas of concern:

- U.S. multinational corporations are not creating overseas employment at the expense of domestic jobs; in fact, they have created substantially more domestic than foreign jobs over the past 15 years.
- Foreign-owned multinationals have created 70 percent as many new jobs in the United States as U.S.-based companies have created overseas.
- Import penetration of U.S. manufacturing markets has increased markedly in the past 15 years, but only a small proportion is due to re-exports from U.S.-owned foreign operations.
- Until 1997, increases in import penetration were shared fairly evenly across our major trading partners: Canada, Western Europe, Mexico, and Japan. Since then, they have been almost completely driven by imports (in large part advanced technology products) from China.
- The surplus in tradable business services has increased, not decreased, in recent years.
- China's advantage in labor costs will diminish over time, both because of double-digit annual wage growth and the fact that labor is a small and declining share of costs in many manufacturing industries.
- Much of the U.S. cost disadvantage relative to China is due to nonwage costs (such as health benefit costs, excessive taxes, tort litigation, and regulatory compliance) that can be reduced via changes in U.S. public policy.

- Today's manufacturing puts a premium on short lead times, slim inventories, and ability to react rapidly to changes in demand. Industries whose products are bulky in relation to their market value (and thus cannot be profitably shipped by air) have strong incentives to be geographically proximate to end-user markets, of which the United States is a large one.

What Is Offshoring?

While there is no generally agreed upon definition of this term, offshoring in its broadest sense refers to the replacement of domestically provided service or production facilities with equivalent facilities in another country. More recently, the offshoring debate has concentrated on specific business services (such as software programming and design, call centers, and accounting and payroll activities) that are possible to relocate abroad thanks to advances in communication and information management technologies.

Offshoring can take two distinct forms. The most visible is when a company creates a foreign wholly or jointly owned subsidiary with production or service facilities (or increases investment and employment in an existing foreign subsidiary). If these facilities serve U.S. markets (or existing foreign markets previously served by U.S. exports), then the company will typically reduce domestic capacity and cut U.S. production jobs (although the company's total domestic employment may in fact rise, as will be discussed in a later section). A more common, though less visible, form of offshoring is to source materials from a foreign supplier. This will increase the import penetration rate and may cause job losses at the original domestic supplier.

Just as important as the definition of offshoring is the motivation behind it. Those who blame offshoring for the loss of manufacturing jobs implicitly assume that it is solely motivated by a desire to take advantage of low production costs. This is certainly one motivation, but examination of data in subsequent sections strongly suggests that the primary reason U.S. companies establish offshore manufacturing operations is to access new foreign markets that are not reachable with domestic production.

A final, but critically important, element of offshoring is that it is a two-way street. Just as U.S.

Table 1
U.S. Import Penetration Rates for Manufactured Goods, Selected Years
 (billions of dollars)

	1987	1992	1997	2002	2004 (est.)
Total U.S. demand for manufactured goods	1,745.2	2,014.0	2,617.0	3,059.7	3,602.4
U.S.-produced	1,368.2	1,528.4	1,851.6	2,043.4	2,352.2
Imported (foreign-produced)	377.0	485.6	765.5	1,016.3	1,250.2
From China	N/A	25.7	62.6	125.2	195.4
Import penetration rate	21.6%	24.1%	29.2%	33.2%	34.7%
China import penetration rate	N/A	1.3%	2.4%	4.1%	5.4%

Source: U.S. Bureau of the Census, U.S. Bureau of Economic Analysis and author's calculations

Note: To avoid double counting, total U.S. manufacturing demand excludes sales of intermediate goods from one U.S. manufacturer to another.

companies offshore production, sourcing, and services to other countries, other countries "inshore" activities to the United States for many of the same reasons.

How Widespread Is Offshoring?

Because offshoring includes a wide variety of business activities, it is not possible to measure directly. Nevertheless, there are several data sources that can be pieced together to synthesize a reasonably detailed picture of recent trends.

Imports and Exports of Goods and Services

Offshoring, by definition, has an impact on U.S. imports and exports of goods and services because it involves moving production or service facilities to other countries. Indeed, many observers point to the ballooning trade deficit as proof that offshoring has reached epic proportions.

However, the trade deficit is driven by many factors, of which offshoring is in fact a relatively small one. For instance, part of the reason for the exploding trade deficit is slow growth in the European economies relative to the United States, which dampened U.S. exports to that region and boosted imports. The strong dollar is also a factor.

Goods.—When a company offshores production to serve domestic markets or increases materials sourcing from foreign companies, that change will show up as an increase in manufactured imports as a share of domestic manufacturing demand, irrespective of the overall trade deficit. Table 1 above shows trends in import penetration for selected years since 1987.

The import penetration rate has risen steadily from 21.6 percent in 1987 to an estimated 34.7 per-

cent in 2004, clearly illustrating the stiffening competition from foreign companies in domestic markets.

The increase in imports is nearly evenly shared between reexports by foreign affiliates of U.S. companies and imports from foreign-owned companies.¹ Driven by the North American Free Trade Agreement (NAFTA), most growth in reexports over the past decade has originated in Canada and Mexico. Those two countries now account for nearly 60 percent of reexports by U.S. foreign affiliates to domestic markets. In contrast, reexports from China and Eastern Europe—two regions often targeted for offshoring—amounted to less than 2 percent total reexports in 2002.

The influence of China in recent import penetration is striking. From 1992 to 1997, China was responsible for only one-fifth of the 5.1 percentage point increase. Since 1997, its importance has grown immensely and, from 2002 to 2004, was responsible for nearly all the increase in import penetration.

More worrying than the raw numbers is the composition of Chinese imports. Historically, imports from China have been concentrated in low-tech goods with high labor content—apparel, footwear, and toys are typical examples. However, advanced technology products—concentrated in information and communications technologies—will reach nearly \$50 billion in 2004, or 40 percent of total imports from China.²

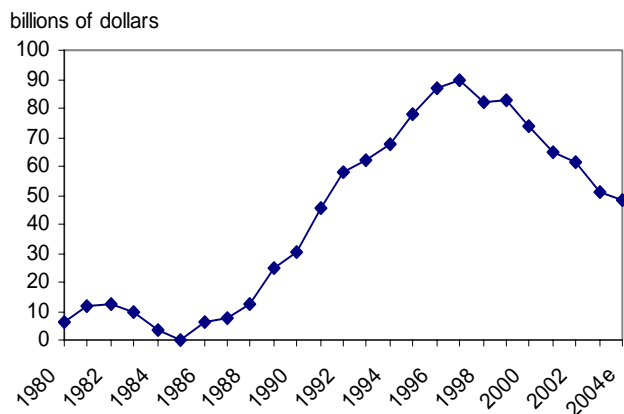
¹ This conclusion can be inferred from the fact that reexports' share of total U.S. imports has remained unchanged at about 38 percent since at least 1994.

² See Ernest H. Preeg, "The Surging U.S. Trade Deficit With China in Advanced Technology Products (ATP)," Manufacturers Alliance/MAPI, E-287, June 15, 2004. The growing ATP deficit with China is the subject of a forthcoming study by Dr. Preeg tentatively entitled *The Emerging Chinese Advanced Technology Superstate*.

Thus, the trade data show us that *import penetration into U.S. markets has risen considerably, but only a tiny part of the increase is due to U.S. offshoring to Asia and Eastern Europe. Most is due to large increases in high-tech imports from Chinese suppliers.*

Services.—As Chart 1 demonstrates, the United States continues to run a large surplus in tradable services, despite rising concern about relocation of service jobs, such as computer programming, call-centers, accounting, financial, and other professional services.

Chart 1
U.S. Trade Surplus in Services, 1980-2004



Source: U.S. Department of Commerce, Bureau of the Census

Trade in services comprises a wide variety of activities, including travel and related expenditures by foreign visitors (exports) and U.S. residents traveling abroad (imports), royalty and licensing fees received from abroad by U.S. companies (exports) or paid by U.S.-based firms to foreign entities (imports), government and military services, and “other services” that include business and professional services, financial and insurance services, and education.

These “other services,” so often associated with offshoring, have nothing to do with the recent decline in the surplus of tradable services. Most of the decline in the surplus in services is due to increased military purchases related to operations in Afghanistan and Iraq and the post-9/11 recession in international travel.³ Table 2 shows trends in the

surplus for services most associated with offshoring. The aggregate surplus increased by 70 percent from 1993 to 1998 and then a further 9 percent from 1998 to 2003. The table also directly contradicts assertions that net offshoring of business service jobs has reached epic proportions: the surplus in business, professional, and technical services increased more than the overall surplus.

Table 2
Surplus in Tradable Services Associated
With Offshoring, 1993-2003
(millions of dollars)

	1993	1998	2003
Education	5,881	7,450	10,704
Financial services	N/A	6,237	12,901
Insurance	-3,408	-4,955	-21,825
Telecommunications	-3,580	-2,115	678
Business, professional and technical services	N/A	23,027	28,863
Other	8,835	14,278	16,670
TOTAL	25,865	43,921	47,990

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

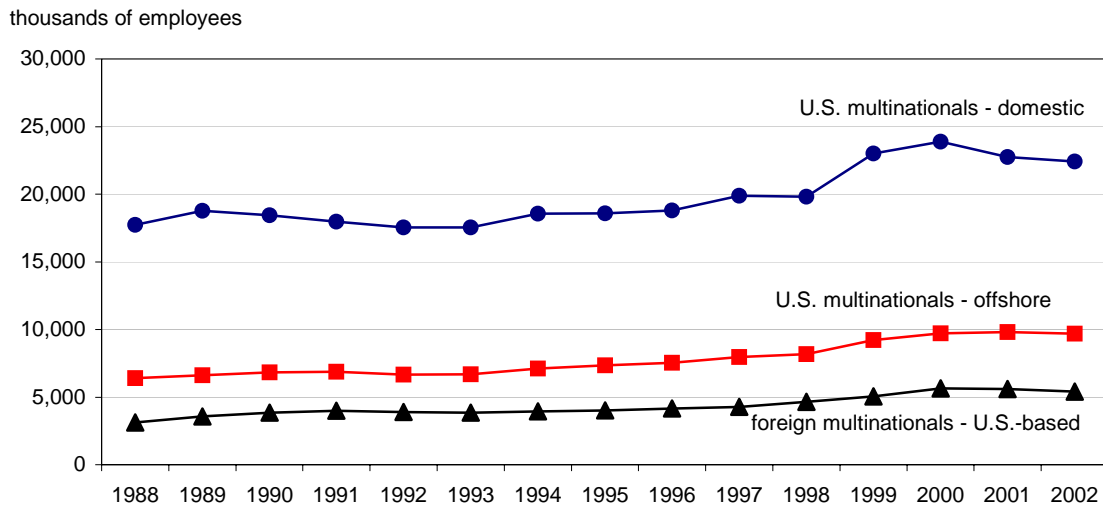
Activities of U.S. Multinational Companies and U.S. Affiliates of Foreign Companies

A major element of offshoring is the relocation of production or service facilities to a wholly or jointly owned subsidiary. The Bureau of Economic Analysis regularly surveys the business activities of U.S. and foreign multinational companies (MNCs). These data capture employment changes within U.S.-owned multinational companies and their foreign affiliates, but they do not capture outsourcing of business activities to foreign companies. In terms of employment, manufacturers account for about 38 percent of all U.S. MNCs.

Chart 2 shows that, for the period 1988-2002, domestic employment at U.S. MNCs increased by 26 percent, or 4.7 million jobs. Over the same period, their foreign employment increased by 51 percent, or 3.3 million jobs. These trends provide a direct answer to the question of exporting jobs: *Multinational companies are NOT creating jobs abroad at the expense of domestic employment.* In contrast, for every job created overseas, nearly 1.5 jobs were created at home. However, the difference in growth rates implies that the percent of employment of U.S. multinationals at home declined slightly from 73.4 percent in 1988 to 69.8 percent in 2002.

³ For a detailed description of the causes of the recent decline in the surplus in tradable services, see Daniel J. Meckstroth, “The Other Side of Offshoring,” Manufacturers Alliance/MAPI, E-283, May 11, 2004.

Chart 2
Employment Trends of U.S. and Foreign Multinational Corporations, 1988-2002



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

The complementarity of foreign and domestic employment illustrates the fact that expansion overseas entails commensurate changes at home.⁴ For example, a firm that wants to serve foreign markets must hire additional researchers and engineers to tailor products to those markets, marketers to sell the products, and logistics personnel to coordinate supply chains and delivery. The data in Chart 2 show that such jobs (which generally pay high wages) are predominantly created at home.

Chart 2 also shows that *“inshoring” of employment in the United States by foreign-owned multinationals increased by 74 percent, or 2.3 million jobs from 1988 to 2002.*

The 2000-2002 period merits a closer look, because domestic employment by U.S. multinationals declined while foreign affiliate employment held steady. Are these domestic job losses due primarily to offshoring or to the U.S. manufacturing recession? Table 3 on page 5 provides evidence that the

recession played a larger role. Total U.S. manufacturing employment decreased by 11.6 percent from 2000 to 2002, but these job losses were disproportionately concentrated in non-MNC manufacturers—companies with no foreign affiliates. U.S. multinational manufacturers shed substantially fewer domestic jobs.

This contrast reinforces the notion that domestic and foreign employment at MNCs are complementary: demand in foreign markets helped cushion multinational manufacturers from the prolonged decline in U.S. manufacturing demand, and the resulting complementary domestic employment helped cushion job losses at home.

The survey of MNC activities also provides indirect evidence on the motivation for creating and expanding foreign affiliates. Four countries—Mexico, China, Poland, and India—accounted for 800,000 new “offshored” jobs from 1988 to 2001. As Table 4 shows, all of them have high rates of gross domestic product (GDP) growth, which provides a strong incentive for U.S. companies to penetrate their product markets, and that is primarily what they have done. As a result, only a small percentage of sales are destined to U.S. customers. The only outlier of the group is Mexico, which enjoys membership in NAFTA and close geographic proximity to the United States.

⁴ For a fuller discussion of this phenomenon, see Gordon H. Hanson, Raymond J. Mataloni, and Matthew J. Slaughter, “Expansion Abroad and the Domestic Operation of U.S. Multinational Firms,” working paper presented at the AEI International Tax Policy Forum seminar “Domestic Effects of Foreign Investment,” December 2, 2004.

Table 3
**Manufacturing Employment by MNC
 Status, 2000-2002**

	2000	2002	Percent Change 2000-2002
Total manufacturing employment	17,263	15,259	-11.6
Multinational manufacturers	8,070	7,367	-8.7
Non-Multinational manufacturers	9,385	7,892	-14.2

Source: U.S. Department of Commerce, Bureau of Economic Analysis and author's calculations

Table 4
**Characteristics of Four Largest Developing
 Country Markets for U.S. Multinational Corporations**

Country	Increase in Foreign-Affiliate Employment, 1989-2001 (thousands)	Average Annual GDP Growth, 1995-2001 (percent)	Percent of Sales to Local Customers	Percent of Sales to U.S. Customers
Mexico	474.8	4.5	64	28
China	269.2	8.3	71	11
Poland	68.5	6.3	76	1
India	66.6	5.7	92	4

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

In each country, there is a small percentage that is destined to neither local nor U.S. markets, and these tend to be to countries within close geographic proximity. For instance, some investments in Poland serve markets in Western Europe and some in China serve Japan. That this geographic proximity to markets continues to be important for the majority of industries is no accident, as we shall see in a later section.

Layoffs Caused by Offshoring and Import Competition

A further source of information about offshoring is the Mass Layoff Survey, which reports quarterly on layoff events that are expected to last longer than 30 days. That survey asks employers to identify the primary cause of the layoff event. Among the possible responses are "import competition" and "movement of work to a foreign location."

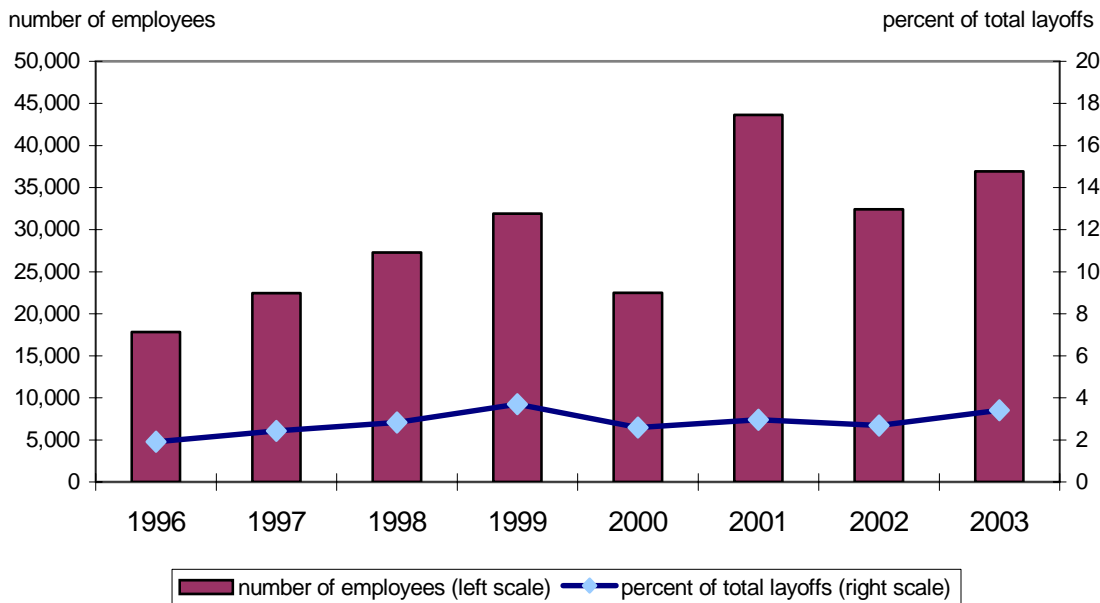
Chart 3 on page 6 shows trends in extended mass layoffs due to import competition and offshoring since 1996, the first full year for which data are available. It reveals two significant facts.

First, there has been an upward trend in the absolute number of layoffs attributable to these factors: since 1996, they have essentially doubled. Nevertheless, there has been no acceleration of the trend in more recent years. At the same time, the percentage of layoffs attributable to import competition and offshoring has risen much more modestly and currently represents only 3.4 percent of total mass layoffs. Contrary to popular perception, *offshoring has not been a major factor in large layoffs of recent years.*

There are several important caveats to this analysis.⁵ Respondents to the survey have the option of not responding to the question concerning

⁵ The Bureau of Labor Statistics attempted to redefine layoffs attributable to overseas relocation to better capture trends in offshoring in 2004. However, difficulties in quantifying the proportion of job losses associated with a single layoff have led the BLS to temporarily suspend publication of such data until a tractable solution is developed. Because of these difficulties, the data reported here must be read with considerable caution.

Chart 3
**Extended Mass Layoffs Due to Offshoring or
 Import Competition, 1996-2003**



Source: U.S. Department of Labor, Bureau of Labor Statistics

the reason for an extended mass layoff, and Chart 3 includes only those layoffs where a reason was specified. In 2003, the number of layoffs for which the reason was not reported more than doubled to 134,000. Because of the negative political connotations of offshoring, companies that did in fact offshore may have chosen to withhold the reason, and one might reasonably conjecture that a large number of such layoffs are in fact due to offshoring. If this is the case, offshoring and import competition may account for 10 percent or more of all mass layoffs rather than the 3.4 percent shown in Chart 3.

A second caveat is that this survey is limited to business establishments employing 50 or more workers, which account for only about 65 percent of total U.S. employment. One may speculate about the degree to which small businesses are engaging in offshoring or being threatened by import competition, but there exist no reliable data to confirm or deny such speculation.

Industry-Specific Employment Effects

It is clear from the preceding analysis that offshoring is and will likely remain a small phenomenon in the context of the overall economy. This,

however, does not mean that specific industries and occupations will not be put at risk. Part of the recent worries stem from the fact that communication technologies have exposed a large group of service industries—notably financial services, data processing, and computer programming.

Several private consulting firms have undertaken studies that attempt to quantify the number of information technology jobs that would move offshore.⁶ The most widely cited of them, published by Forrester Research in November 2002 and revised in May 2004, estimated that 3.4 million jobs in 18 occupational groups would move offshore to lower-cost jurisdictions like India, Russia, China, and the Philippines by 2015.

If these predictions prove to be accurate, large shares of jobs in selected occupations once thought to be immune from international competition may in fact migrate overseas. However, it is important to remember that such long-run predictions are very sensitive to initial assumptions, which are often based on a relatively small universe of experience.

⁶ For a summary of their findings, see “Current Government Data Provide Limited Insight Into Offshoring of Services,” Government Accountability Office, #GAO-04-932, September 2004, pp.42-45.

As a point of comparison, Forrester Research predicted in 1998 that Web-based business-to-business e-commerce would grow from \$43 billion to \$1.3 trillion by 2003,⁷ putting bricks-and-mortar distributors at great risk. This estimate proved far too optimistic: by 2002, the actual value of Web-based B-to-B e-commerce was on the order of \$350 billion.⁸

Offshoring, China, and Future Prospects for U.S. Manufacturing

The preceding analysis has shown that offshoring today, whether in manufacturing or related services, is not nearly as widespread as some observers have asserted. Nevertheless, there are certainly many reasons to believe that pressures to source or move production and services outside of the United States will continue to mount, for three interrelated reasons:

- Increasingly business-friendly environments in developing countries with relatively well-educated populations (notably China, but also India and Eastern Europe) that facilitate foreign investment.
- High nonproduction costs in the United States (such as health benefits, taxes, regulatory and litigation, and energy) relative to both industrial and developing nations.
- High labor costs in the United States relative to developing nations.

The Chinese economy strikes fear into the heart of U.S. manufacturers.⁹ Home to one-sixth of the world's population, China is experiencing an economic transformation that has produced 9 percent growth rates for a decade. If these rates continue, China may account for 20 percent of global GDP by 2015, eclipsing the United States.

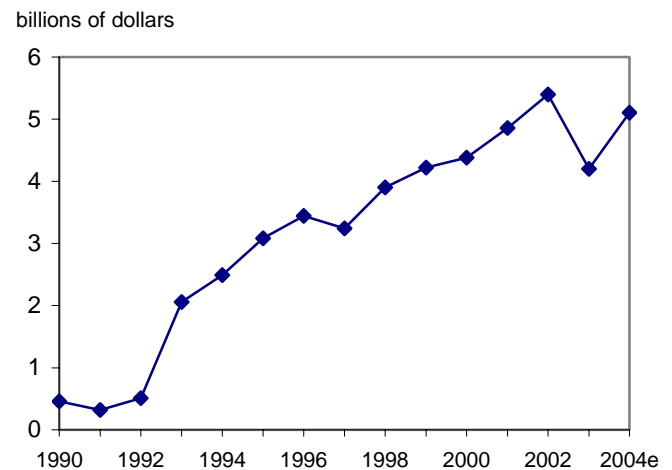
These industry shifts brought about by changing dynamics of international competition, while new to many service industries, are not new to manufacturing. China has long been a competitor to the United States in low-skilled, labor-intensive

industries. Apparel and consumer electronics are just two of many examples of industries that have had to adapt—and in some cases shrink—due to increasing competition from China. In the past, U.S. manufacturing has tended to evolve away from low-skilled, labor-intensive industries to higher value-added, precision-product industries in which China was uncompetitive in recent years, but China has been taking steps to develop those capabilities

Foreign Direct Investment

U.S. foreign direct investment (FDI) in China has exploded. From 1990 to 2004, it increased elevenfold (from \$460 million to an estimated \$5.1 billion). However, as Chart 4 shows, this growth trend stopped in 2002. The sharp decline in 2003 is explained in part by the SARS outbreak, but it is somewhat surprising that FDI in 2004 is likely to be below 2002 levels. Some observers speculate that rising land and labor costs in popular coastal destinations have led companies to look further inland, creating a pause in overall FDI growth.

Chart 4
U.S. Foreign Direct Investment in China, 1990-2004



Source: Chinese Ministry of Commerce (MOFCOM)

In the perspective of total U.S. FDI, the share going into China and Hong Kong is minuscule. The U.S. direct investment position in China and Hong Kong increased from \$32 billion in 1999 to \$56 billion in 2003. Over the same period, however, U.S. positions in Canada and Europe increased from \$700 billion to \$1.2 trillion—two-thirds of total cumulative FDI.

Even in China, the United States is a relatively minor player with regard to investment. As Table 5

⁷ “U.S. online business trade will soar to \$1.3 trillion by 2003,” Forrester Research press release, December 17, 1998.

⁸ Author’s estimate based on data published by the U.S. Economic and Statistics Administration’s E-Stats division. The total amount of B-to-B e-commerce—\$1 trillion—includes non-Internet EDI-based transactions, which were widely used in manufacturing well before the Internet revolution.

⁹ See, for instance, “The China Price,” *Business Week*, December 6, 2004, pp. 102-124.

shows, the large majority of FDI originates in geographically proximate jurisdictions: Hong Kong, Japan, South Korea, Taiwan, and Singapore together accounted for over 60 percent of inward FDI to China.

Table 5
Geographic Distribution of Foreign Direct Investment to China, 2003

	Billions of dollars	Percent of total
Hong Kong	17,700	33.1
Virgin Islands*	5,777	10.8
Japan	5,054	9.4
South Korea	4,489	8.4
United States	4,199	7.8
European Union	3,930	7.3
Taiwan	3,377	6.3
Singapore	2,058	3.8
Other	6,926	12.9
TOTAL	53,510	100.0
Geographically proximate	32,678	61.1

*The large share of investment originating in the Virgin Islands is reflective of companies (chiefly British) that route foreign investment through this nation for tax purposes.

Source: Chinese Ministry of Commerce (MOFCOM)

There is no denying that China will continue to grow in importance as a destination for U.S. foreign direct investment, but this growth must be put in context. Investment opportunities for U.S. companies are growing around the globe (including in the mature industrial democracies), and geographic and historical links will continue to have a considerable influence on U.S. decisions on where to locate production facilities.

Labor Costs and Nonproduction Costs

The large gap in labor costs between China and the United States is well-known, but its magnitude is difficult to gauge accurately. Reliable data on manufacturing wages in China by occupation or skill level are virtually nonexistent. Based on an exhaustive analysis of Chinese data, a researcher at the Bureau of Labor Statistics recently concluded that, as of 2002, compensation of Chinese unskilled factory workers ranged from \$0.45 in suburban and rural regions to \$1.06 in cities, far below the comparable figure of over \$21 in the United States.¹⁰ Average wages for higher-skilled occupa-

tions such as engineers are thought to be in the range of \$5 to \$8 per hour, compared to almost \$30 per hour in the United States.

With a twentyfold advantage in unskilled labor costs and a fivefold advantage in higher-skilled labor costs, China's manufacturing sector may seem unbeatable. But it is important to remember that wages and salaries are a small and declining share of manufacturing costs; in 2001, they accounted for just 22 percent (with considerable variability by industry). Further improvements in productivity virtually assure that this share has dropped since and will continue to drop in the future.

In this context, it is useful to compare a stylized hypothetical cost structure of a U.S.-located plant and an identical plant located in China, which is shown in Chart 5 on page 9. To simplify the analysis, it is assumed that direct nonlabor costs (which include materials, capital equipment, and energy costs) are identical, labor costs in China are one-tenth the U.S. level (reflecting a reasonable mix of skilled and unskilled labor), and that the quality of the Chinese labor force is equivalent to that in the United States (meaning that productivity levels of the two plants are the same).

The chart shows that replacing a U.S. manufacturing plant with an identical one in China would reduce direct production costs by about 25 percent. If productivity levels of the Chinese factory were equal to its U.S. counterpart (a debatable assumption) then the Chinese factory could reduce its price by 25 percent without a decline in profitability—a large, but not insurmountable, advantage. If we remove the effect of nonwage compensation (which includes employer-paid health insurance and pensions), the U.S. cost disadvantage shrinks to less than 20 percent.

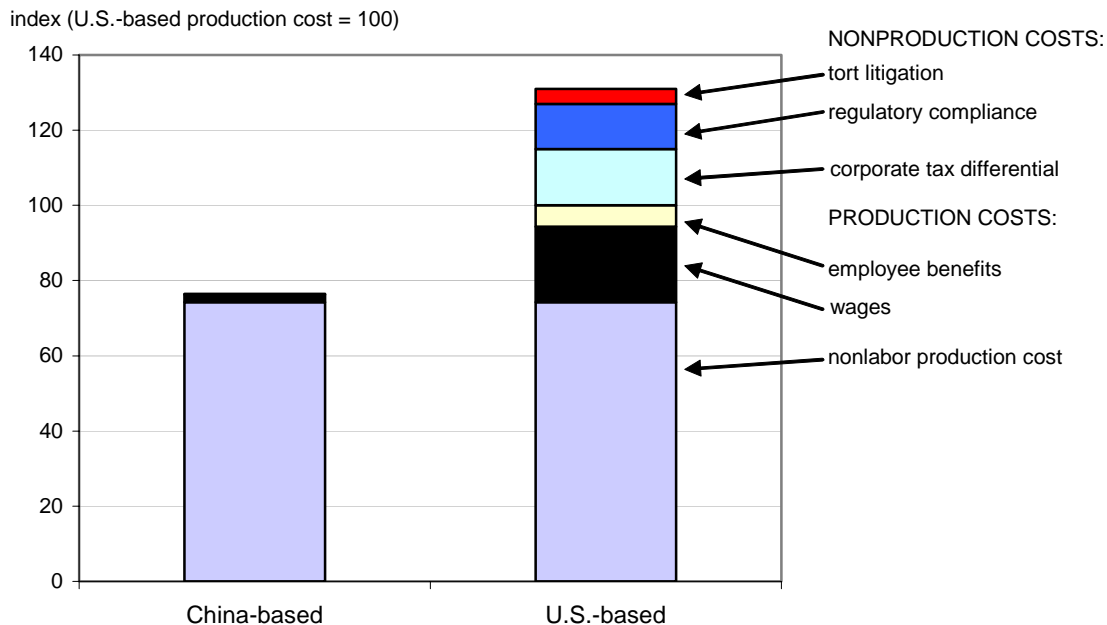
The more important conclusion of Chart 5 is that indirect nonproduction costs—such as excessive corporate taxes, actual or threatened tort litigation, and regulatory compliance—are a much larger burden than wage costs in U.S.-based production facilities. These factors, unlike wage differentials, are in part the result of U.S. policies affecting manufacturing and can be addressed.¹¹

With regard to the current U.S. labor cost disadvantage, economic history suggests that there is a silver lining. As countries industrialize, labor compensation tends to grow. The text box below

¹⁰ Reported in Peter Coy, "Just How Cheap Is Chinese Labor?" *Business Week*, December 13, 2004, p. 46.

¹¹ For a more complete discussion, see Jeremy A. Leonard, *How Structural Costs Imposed on U.S. Manufacturers Harm Workers and Threaten Competitiveness*, Manufacturers Alliance/MAPI and National Association of Manufacturers, December 2003.

Chart 5
**Comparative Cost Structure of Identical Plants
 in the United States and China**



Source: Author's calculations based on data from U.S. Bureau of Economic Analysis and cost estimates in Jeremy A. Leonard, *How Structural Costs Imposed on U.S. Manufacturers Harm Workers and Threaten Competitiveness*, Manufacturers Alliance/MAPI and National Association of Manufacturers, December 2003

discusses the case of South Korea, which transformed itself into an industrial powerhouse over the course of just a few decades. Labor compensation,

once nearly as low as it is in China now, has risen to the point where it is on a par with Japan measured at exchange rates prior to the 1997 financial crisis.

Wage Growth and Industrial Development: The Case of South Korea

South Korea provides a striking example of how rapid industrial development is accompanied by rising labor compensation. In 1960, its per-capita GDP was just 12 percent of the U.S. level, and much of the population was employed in agriculture. Today, it is a global industrial economy. Its per capita GDP has rocketed to over 50 percent of the U.S. level (compared to 73 percent for Japan) and companies like Hyundai and Samsung have become large players in the global economy.

Parallel to this economic development was a steady increase in labor compensation costs. From 1975 to 2003, average compensation for Korean manufacturing production workers increased from 5 percent of the U.S. level to nearly 50 percent, and the gap continues to close.

South Korea's experience simply illustrates a rule that to date has known no exceptions: rapid industrial development is accompanied by commensurate rises in labor compensation growth. Part of this is due to tighter labor markets as demand for manufacturing workers grows, but most of it is explained by increasing productivity. Industrialization results in a wider variety of goods and services available for domestic consumption, stimulating demands for wage increases, which strong productivity growth can deliver.

China is no exception to this rule. Despite having a large pool of unskilled and semi-skilled workers to fill jobs in both domestic- and foreign-owned manufacturing operations (which might otherwise suggest sluggish wage growth), average manufacturing wages have grown on the order of 16 percent annually since 1991 in China, suggesting a cumulative growth rate of well above 100 percent.*

*Yiping Huang, "How Cheap Is Chinese Labour," Citigroup Current Economics, June 2003.

There is mounting evidence that growth in skilled manufacturing wages in China will accelerate over the next decade, substantially narrowing the current gap with the United States.¹²

Transportation and Logistics Costs

Another important dynamic that may work to the advantage of U.S. manufacturing is the push for manufacturing practices that shorten and/or streamline supply chains, allowing companies to respond rapidly to changes in product demand and move to a make to order model of “mass customization.” Speed to market has become an important competitive weapon and geographic distance can conspire to offset the benefits of lower production costs.¹³

Most manufacturers that have extensively offshored operations to China to supply U.S. markets produce goods whose value is large relative to their weight or volume. Because air transportation costs relative to the value of the product are small, many IT manufacturers—such as IBM and Dell—assemble personal computers in China for distribution to the United States and elsewhere. In this case, air transport shortens the supply chain sufficiently to exploit the advantages of low labor costs in China, while offering build-to-order capability to their customers. If those products were shipped by sea, the logistics costs of maintaining inventory in the domestic distribution network would not allow personal computer manufacturers to meet customers’ demands for timely build-to-order capability.

The apparel industry, long dominated by low-cost Chinese manufacturers, provides another case study of the advantages of a short supply chain. Fashion apparel is notorious for its fad-driven spikes in demand that often disappear as quickly as they arrive. This dynamic has led a California maker of casual wear to locate all of its manufacturing facilities—from weaving to dyeing to sewing—in downtown Los Angeles. As a result, it can fill orders for up to 160,000 units in 24 hours and carry less than 30 days’ inventory. The same general logic has governed behavior in the automobile industry for years and explains why almost

all cars sold in North America (whether domestic or foreign nameplate) are manufactured here as well.

Transaction costs associated with freight forwarding and customs clearance also add to the direct cash cost of sourcing or manufacturing from abroad. A cost analysis by Ingersoll-Rand Company found that up to 25 percent of the cost of a commodity shipped from abroad is due to duties, taxes, freight, and related fees.¹⁴

There is thus a fundamental tension between production costs (which tend to favor low-cost, geographically far-flung suppliers like China) and logistics and transportation costs (which tend to favor geographic proximity). While information technologies have provided the infrastructure to lower the cost of a globally sourced supply chain, they cannot change the fact that China is 10 days from the West Coast of the United States by ship, nor reduce the inherent uncertainty associated with moving goods across national frontiers.

Conclusion: Prospects for U.S. Manufacturing

From the preceding analysis, several themes stand out. The most important is that, contrary to a widespread perception, offshoring—defined broadly as the relocation of manufacturing and service facilities to lower-cost overseas locations—is a relatively small phenomenon when measured against the size of either the U.S. manufacturing sector or the economy as a whole. If we define offshoring more narrowly to include only those relocations that serve U.S. markets (leaving out offshore activities that serve to open new overseas markets), the impact is even smaller.

The second is that the flip side of offshoring—foreign companies locating operations in the United States—is as strong as ever. Job growth of U.S.-based foreign multinationals has increased faster than foreign job growth of U.S. multinationals for the past 15 years, and the U.S. trade surplus in business services has increased, not decreased, in recent years.

The third is that labor costs are growing rapidly in China (and all countries that have been targeted by U.S. companies for offshore operations), confirming what economists have long known to be

¹² See, for instance, Clifford Waldman, “The Labor Market in Post-Reform China: History, Evidence, and Implications,” *Business Economics*, Volume 39, No. 4, October 2004, pp. 50-62.

¹³ This section draws on Robert Sternfels and Ronald Ritter, “When Offshore Manufacturing Doesn’t Make Sense,” *McKinsey Quarterly*, 2004, No. 4.

¹⁴ Quoted in W. Costello, K. McCone-Sweet and A. Rao, “Offshoring/Outsourcing: Fragile—Handle With Care,” *Babson Insight*, <http://www.babsoninsight.com/contentmgr/showdetails.php/id/701>.

true: strong wage growth goes hand in hand with rapid industrial development. In sharp contrast, unit labor costs have been flat for more than a decade in the United States, thanks to rapid productivity growth. With labor cost a small and declining proportion of total manufacturing costs, advantages in China and elsewhere will diminish over time.

The fourth is that efforts to streamline supply chains, such as mass customization, lean manufacturing, and just-in-time inventory management, may provide some disincentive to offshore. These all place a high value on timely access to parts and materials (often on a made-to-order basis), placing a premium on geographic proximity that will offset to varying degree the raw labor cost advantages offered by geographically distant nations like China. In this regard, the large U.S. consumer market will continue to attract foreign investment operations and help keep domestic operations in the United States.

These trends, although they are certain to change the nature and industrial structure of U.S. manufacturing, are not a long-term threat to the sector itself. Industries for which labor is a large part of the cost structure, or for which geographic proximity to customers and suppliers is not essential for cost-effectiveness, will indeed have large incentives to move offshore, taking jobs with them. At the same time, the dynamism, innovation, and entrepreneurial spirit of the U.S. manufacturing sector will open up new industries that will assure its strength in the global economy well into the future.¹⁵

¹⁵ See Thomas J. Dueterberg and Ernest H. Preeg, *U.S. Manufacturing: The Engine for Growth in a Global Economy*, Praeger Publishers, October 2003.