

Southwest Economy



China: Awakening Giant

China has had four distinct periods in its 4,000-year history. Until the 16th century, China's economy performed on par with countries elsewhere in the world. As shown in Chart 1, which plots gross domestic product (GDP) per capita, China's economy outperformed that of Western Europe for more than 1,000 years. Toward the end of the Ming Dynasty (1368–1644), however, and throughout the Ching dynasty (1644–1912), China stagnated, its GDP per capita rising virtually zero for more than 300 years.

During the same period, Western Europe enjoyed rapid economic development, riding the scientific revolution that began in the 11th century. After the 18th century, growth in Western Europe skyrocketed, while China slipped into decline as it shunned progress and closed its doors to the outside world. China's isolationism eventually led to invasion from Western and Japanese forces, driving the nation's GDP per capita back down to levels seen 2,000 years earlier. Just a quarter century ago, China began to awaken from its 500-year sleep, and today it is rapidly catching up with the Western world.

The year 1978 marks a turning point in China's modern history. That's when Deng Xiaoping began to remake the economy around market principles.

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INSIDE:
*Social Security
 Restructuring:
 Tough Decisions Ahead*

*(Mis)reporting Mexico's
 Gross Domestic Product*

U.S. Natural Gas Prices Heat Up

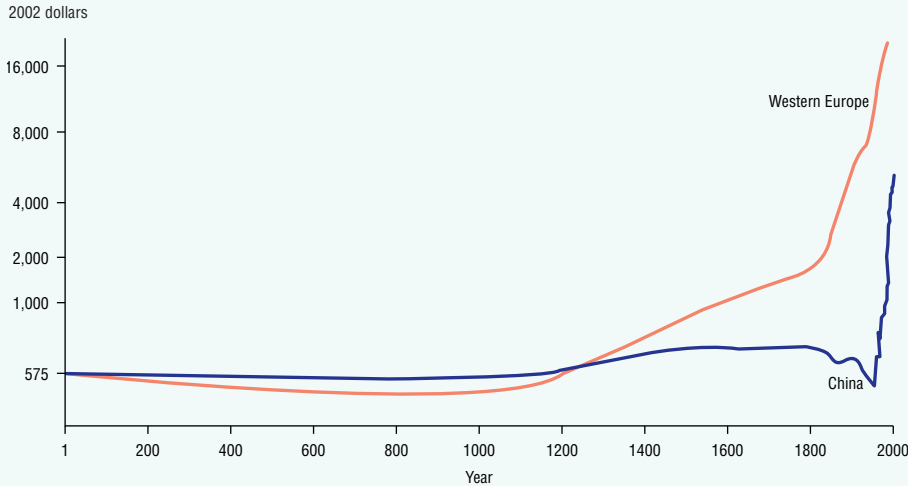
Although the United States is thought to have plentiful natural gas resources, the price of gas has more than doubled in the past year (*Chart 1*). During 2003 the amount of natural gas supplied was insufficient to satisfy demand without sharply higher prices. Futures prices suggest relatively high natural gas prices will be sustained for the next few years.

In fact, the outlook for natural gas prices depends on a number of factors. Over the next few years, the prospects for lower prices depend largely on an unseasonably cool summer or an unseasonably warm winter. A lack of shut-downs in offshore production in the Gulf of Mexico during the fall hurricane season could also soften prices. Over the longer run, further development of domestic resources, pipelines and import facilities for liquified natural gas

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Chart 1

GDP per Capita: China and Western Europe, 1–1998 A.D.



SOURCES: Maddison, Angus (2001), *The World Economy: A Millennial Perspective*, Organization for Economic Cooperation and Development, p. 42; authors' calculations.

In 1978, China had the world's ninth largest economy, with a GDP just one-eighth that of the United States and a third that of Japan. But by 2001, China had grown to the world's second largest economy, with a national output over half that of the United States and 60 percent larger than Japan's.

China's growth rate has slowed somewhat from its torrid double-digit pace of the mid-1980s and early 1990s, but still its GDP is expanding at roughly 8 percent per year (*Chart 2*). At this rate, and assuming, say, a 3 percent average annual growth rate for the United States, China will ascend to the world's largest economy in just 12 years.¹

Whether or not China continues to grow at such a rapid pace remains to be seen. But with its large population and labor force, China's preeminence is inevitable if its modernization continues. At 1.3 billion, China's population is 4.5 times that of the United States. The labor force comparisons are astounding. The United States has roughly 130 million workers. China has 760 million—six times more than the United States. It is truly a giant.

In many ways, China's emergence into the world economy is like the grand "exogenous" shock economists might conceive in a mathematical model, a change so large that, as economist Joseph Schumpeter wrote, "hardly any 'ways of doing things' which have been optimal before remain so afterward."²

This article investigates the effects of China's awakening on the world economy in five major areas—employment, production, trade, capital flows and inflation—and concludes with a look into education and technology—what China must do next to continue down the road of economic development.

Employment and Production

China is a nation in transition from an agricultural economy to an industrial one. Fifty percent of China's labor force still works in agriculture, compared with

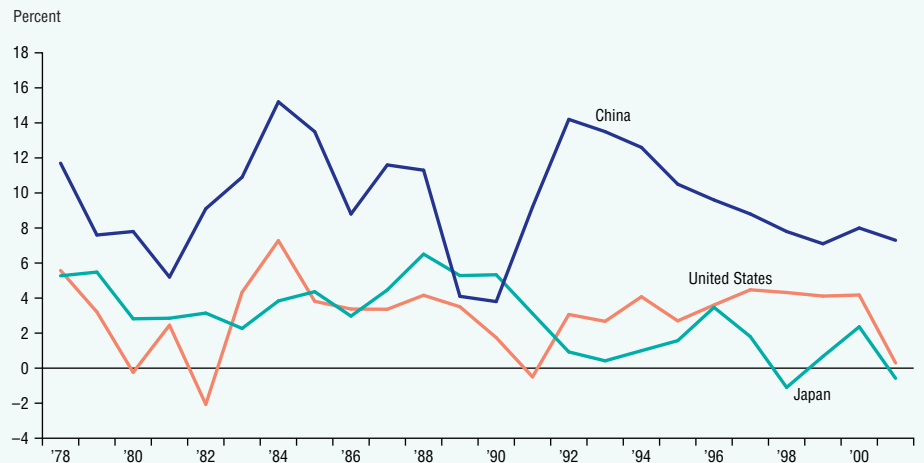
just 2 percent of U.S. workers. Roughly the same fraction in each nation works in industry—the combination of manufacturing, mining and construction.³ The industry figure is 22 percent in China and 19 percent in the United States. Just 28 percent of Chinese work in the services sector, whereas 79 percent do so in the United States. China will surely outgrow manufacturing and transition one day to a largely services economy, as did the United States in gaining its wealth, education and human capital. But right now, China is following the footsteps of early 20th century America and mid-20th century Japan, that is, developing its industrial base.

China's transition from agriculture to industry and services is epitomized by the nearly 100 million migrant laborers who work in a city factory or office, often living in a company dormitory and returning to the country once or twice a year to visit their family. Labor is moving to the city because wages there are much higher than in the country. Urban workers in 2001 earned an average of 6,860 yuan, whereas rural workers made just 2,366.

Chinese factory workers earn more than those in agriculture for two (not unrelated) reasons. First, factory goods are readily traded in the world. China's top exports in 2001 were all industrial goods—textiles, fabric, footwear, furniture, electronics and so on. Second, fac-

Chart 2

GDP Growth Rates



SOURCE: *International Financial Statistics*, International Monetary Fund.

Table 1

Four Tiers of Wages*Hourly Pay in Manufacturing, 2001*

Country	Dollars per hour
Japan	16.46
United States	16.14
Europe	14.13
Singapore	6.72
Korea	5.69
Taiwan	5.18
Mexico	2.08
Brazil	2.04
China	.61

SOURCES: Bureau of Labor Statistics; *China Statistical Yearbook*, National Bureau of Statistics.

tory workers are generally more productive than those in agriculture because they have more capital with which to work. Chinese factory workers may not have a lot of machinery and equipment compared with U.S. factory workers. But it's a lot more than what's found in Chinese agriculture, where workers still toil mainly with their hands and with little of the technology used on U.S. farms.

Productivity in China's agricultural sector—measured as output per worker—averages just 3.2 percent of that on U.S. farms. One U.S. farm worker produces more output than 31 Chinese farm workers; one U.S. factory worker produces more output than five Chinese factory workers. Employment in China is shifting to manufacturing because productivity and wages there are higher than in agriculture.

But manufacturing jobs are also shifting to China from other parts of the world because of China's cheaper labor. You might say there are four tiers of manufacturing wages in the world: high wages, like those found in Japan, the United States and most of Europe; second-tier wages, such as those of other Asian economies; substantially lower wages in less-developed countries, such as Mexico and Brazil; and wages in China, which are lower still (*Table 1*).

Averaging 61 cents, China's hourly manufacturing wages are just 4 percent of U.S. wages (\$16.14) and 29 percent of Mexico's (\$2.08).⁴ Even adjusting for the higher productivity levels in the United

States and Mexico, as well as other factors (shipping cost, product quality and so on), it is easy to see why manufacturing companies might consider shifting operations to China.⁵ And the lure will likely continue for quite some time. Economists estimate that over the next decade or so, China's industrial sector will have to create jobs for more than 150 million workers, as it did for nearly 100 million workers during the 1978–2001 period. Such massive labor flows should continue to hold down China's manufacturing wages, affecting the global mix of who produces what and where for years to come.

Trade and Capital Flows

China continues to ramp up into a largely manufacturing-for-export nation. It exported 25 percent of its GDP in 2001, up from less than 5 percent in 1978. China has overtaken Japan as the leading Asian exporter to the United States (*Chart 3*). The huge seasonal pattern of toys and other festive items imported from China each Christmas is distinctive, but the more significant phenomenon is the long-term trend. China is methodically gaining U.S. import market share from all its neighbors.

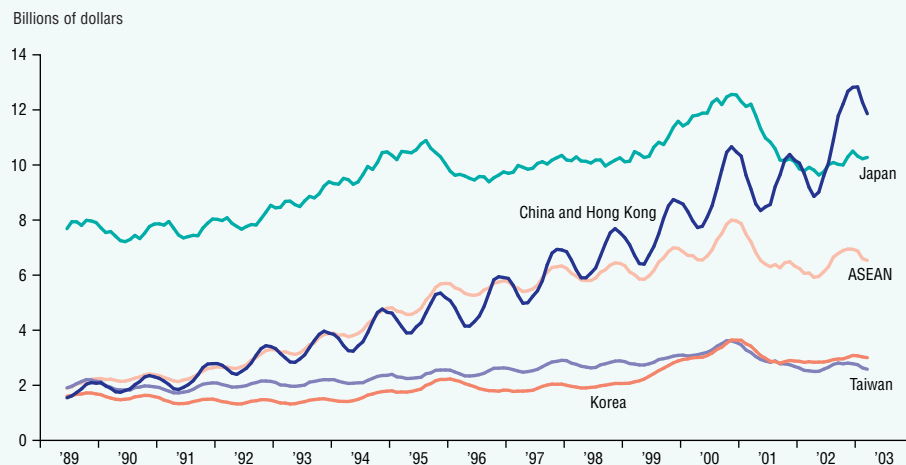
China's awakening is, of course, already affecting industry in other nations. Consider, for example, Japan and Mexico. From 1978 to 1999, both China and Mexico gained market share in clothing, textiles and related industries at

the expense of other producers, such as Japan. China's market share in this industry increased from 2.4 percent to 15.4 percent and Mexico's from 0.6 percent to 4.5 percent, while Japan's declined from 20.5 percent to 13.2 percent. More recent data are not available at the specific industry level, but the overall export numbers indicate that even Mexico is now having trouble keeping up with China's export push. Over the period from 1980 to 1999, Mexico's exports rose by \$121 billion, while China's rose by \$177 billion. But in the past three years, China's exports have shot up by \$188 billion—more than the previous two decades—while Mexico's inched up by just \$13 billion.

China's growing production is no doubt affecting competitors, but clearly the impact of China's emergence on overall foreign production isn't bad. Just as you're better off when your neighbors are rich than when they're poor, China's growth will come with a mostly positive upside, especially for savvy world suppliers who tune in to China's needs.

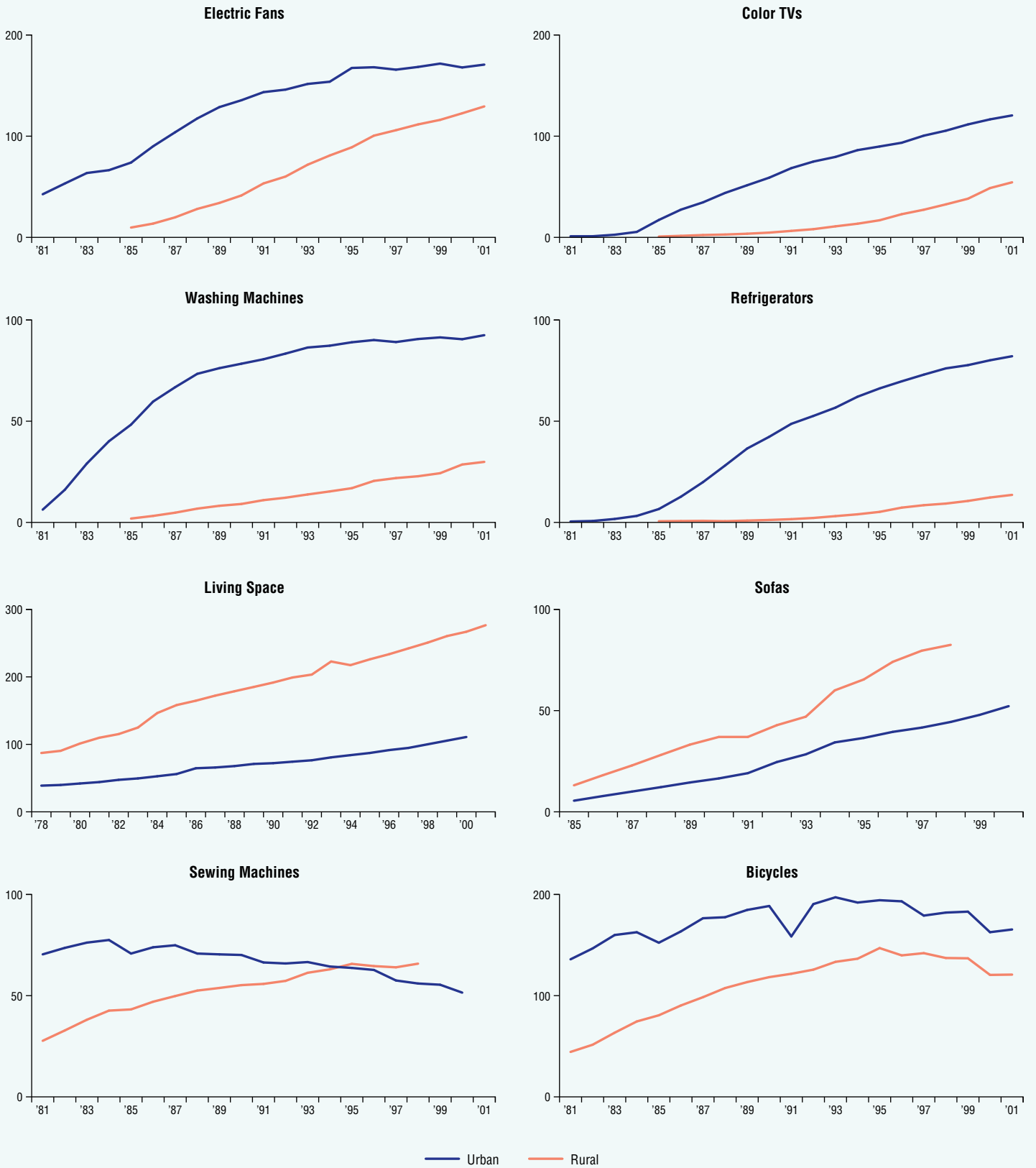
As China exports more of what it produces, it will import more of what it consumes, creating a huge market for foreign producers. Indeed, China's imports as a share of GDP grew from 2 percent in 1970 to 23 percent in 2002. The data clearly show that as China produces more, it is consuming more as well. Chinese households—in both the country-

Chart 3

China: Leading Asian Exporter to the United States

SOURCE: *Direction of Trade Statistics*, International Monetary Fund.

Consumer Goods per 100 Households in China



NOTE: Data are in number of items except for living space, which is square feet per capita.
 SOURCE: China Statistical Yearbook, National Bureau of Statistics.

Table 2

A Burgeoning Consumer Market

Item	Per 1,000 people*	
	China	United States
Bicycles	583	361
Motorcycles	22	15
Autos	6	475
Telephone main lines	137	667
Mobile phones	110	451
Radios	339	2,117
Televisions	304	835
Cable TV subscribers	69	257
Living space (square feet per capita)	66	718
Electric power consumption (kilowatt-hours per capita)	827	12,322

* Unless noted.

SOURCES: China: Bicycle, autos, *China Statistical Yearbook*, National Bureau of Statistics; living space, *The Housing Indicators Program*, vol. 2, United Nations Centre for Human Settlements and the World Bank. United States: Bicycle, www.bikelink.com; living space, *Housing Characteristics, 1993*, U.S. Department of Energy, Energy Information Administration. All other data are from *World Development Indicators*, World Bank.

side and the city—increasingly own electric fans, color TVs, washing machines and refrigerators (*Chart 4*). City dwellers tend to have more of most things. But with less living space than country folks, they tend to own a foldout bed rather than the standard couch.

As China's population gains wealth, it is buying more of most things but less of others, such as sewing machines and bicycles. The bicycle has been the main means of transportation in China for over half a century. It's affordable and versatile. Nearly 100 people in China own a bike for every person who owns an automobile (*Table 2*). China has 583 bikes, 22 motorcycles and just six cars for every 1,000 people. The United States has not six, but 475, cars per 1,000 people. Raising China's auto-ownership rate to, say, just a fifth of U.S. levels would require production of 114 million more vehicles—nearly as many as are already operating in the United States. There's still a lot of room to go in selling many such consumer staples—radios and TVs, electricity and much, much more.

China is a burgeoning consumer market, but it also needs many of the intermediate products and physical capital—machinery, equipment, software and the like—that go into production. Largely on the basis of these types of sales, China's neighbors (excluding Japan)—Korea, Russia, Malaysia, Thailand, Taiwan, Philippines, Singapore, Indonesia and

Vietnam—have seen their trade balances with China improve from a combined surplus of \$500 million in 1992 to \$26.5 billion today. With the exception of Vietnam, every one of these nations now has a trade surplus with China.

World capital flows into China also reflect the nation's growing purchases of investment-type goods. As late as 1980, virtually no capital flowed into China from the rest of the world. Last year, though, the figure approached \$50 billion—more than capital flows into the United States (*Chart 5*). The money

appears to be coming from all over the globe and includes what might otherwise have been invested in the United States and China's Asian neighbors.

China clearly has been getting a lot of investors' attention worldwide, and interest intensified with the anticipation of China's 2002 entrance into the World Trade Organization. Capital seeks labor, and China's massive shift from farm to factory will likely offer world capitalists the labor with which to earn good rates of return for decades.⁶

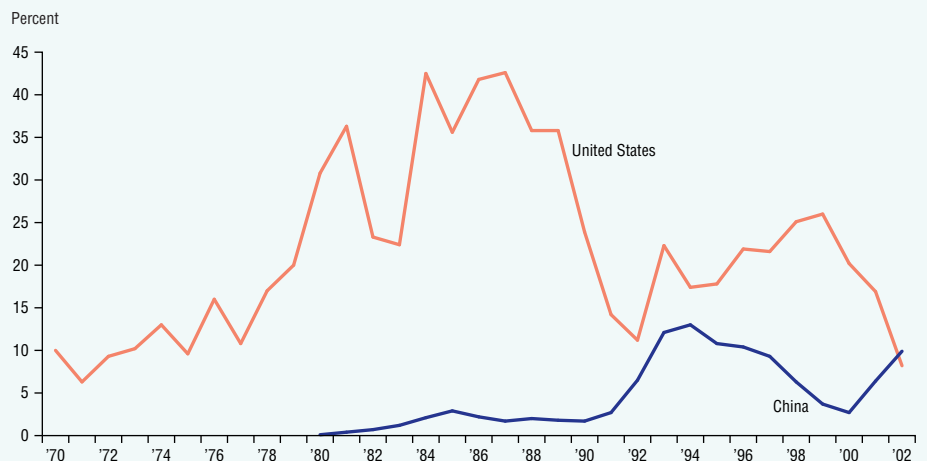
Inflation

China's burgeoning industrial output has almost surely been restraining world and U.S. inflation. In effect, China's emergence into world production and trade has acted like rapid technological progress or a massive supply shock. By importing Chinese goods, nations have been able to replace higher-cost suppliers with lower-cost ones, much the same as they could if production technology were to advance in their home industry.⁷

U.S. imports from China have grown from nil in the late 1970s to 10 percent of GDP today, putting China just below Mexico in terms of U.S. imports from nonindustrialized nations. Roughly half of all U.S. imports today are from nonindustrialized nations—Mexico, China, the Association of Southeast Asian Nations (ASEAN), Korea, Taiwan, Brazil, Venezuela and so on. This is China's peer group in

Chart 5

Foreign Direct Investment as a Percentage of World Total

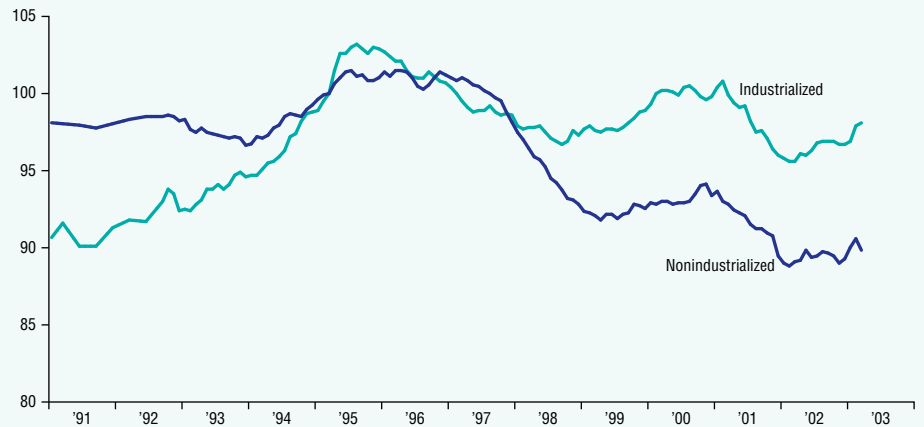


SOURCE: *World Investment Report*, United Nations Conference on Trade and Development.

Chart 6

U.S. Import Price Index for Manufacturing Goods

Index, March 1995 = 100



NOTE: Industrialized countries include Western Europe, Canada, Japan, Australia, New Zealand and South Africa.
SOURCE: Bureau of Labor Statistics.

Our growing imports from China appear to be putting downward pressure on U.S. inflation.

terms of the products it produces and the direct competition it exerts. In 2002, roughly 20 percent of U.S. imports from nonindustrialized nations were from China. But just as a large, growing retailer like Wal-Mart can exert price pressure on its market well beyond its market share, China's influence over its competitors' pricing power likely extends far beyond its current market share.⁸ This is important because the price index for manufactured goods from nonindustrialized nations has been falling for the past six years (*Chart 6*).

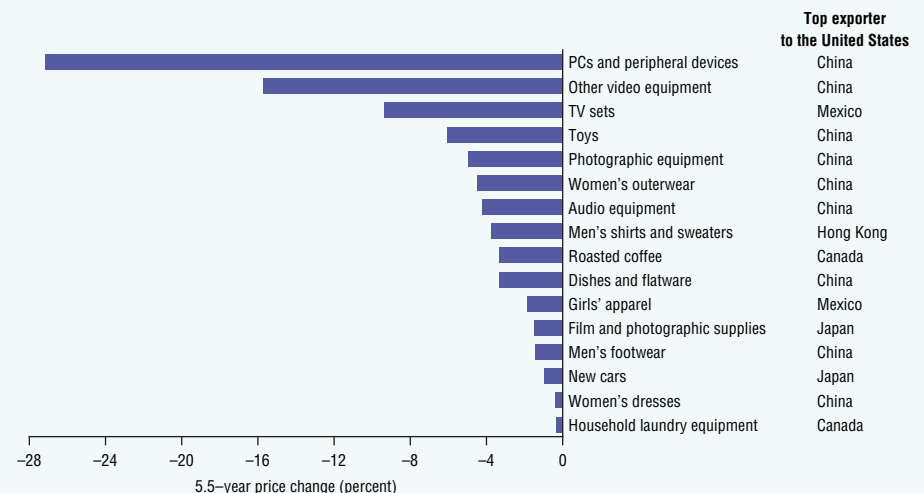
Our growing imports from China appear to be putting downward pressure on U.S. inflation. China is the leading exporter to the United States of PCs, video, audio and photographic equipment, toys, dishes and flatware, numerous clothing items and more, all of whose prices have fallen over the past five and a half years (*Chart 7*).⁹

What's Ahead for China: Building Education and Technology

China is now a low-wage nation, abundant in unskilled labor. If China is

Chart 7

China: Bringing the U.S. Cheaper Products



SOURCES: Bureau of Labor Statistics; U.S. International Trade Commission.

to improve its living standard substantially, it will have to produce and export more knowledge-intensive products. Indeed, China is already doing so. High-tech products make up 23 percent of China's exports today, compared with less than 1 percent in 1985. In its early years of industrialization, Japan mass-produced relatively unsophisticated electronics—such as transistor radios—and progressively upgraded production to more sophisticated, higher-dollar exports, typified by the Lexus automobile. This development model has been observed by most other modern wealthy nations, including the United States, and it's one that can work for China, too. But it requires building education and technology far above current levels.

China today has six times the university population it did in 1978—56 students per 10,000 population, compared with just nine back then. But that's still just about a tenth of U.S. levels (541 students per 10,000 population), not enough to sustain growth. So Chinese students are leaving in droves to get advanced degrees elsewhere. 1999 is the latest year for which data are available on the number of Chinese students going abroad to study, but even back then the data showed a huge jump. Interestingly also—and exactly what one would expect—more Chinese students today are returning to China once they complete their education. This is probably just the beginning of a trend, where more and more students return home as China's economy develops and becomes more privatized.

Nearly 40 percent of China's workers today are employed in private or foreign-funded enterprises. That's up from zero in 1978, and it means they can now run a business for profit. Economic theory suggests that as market principles take greater and greater hold in China, its population will earn a better rate of return on education; thus, more people will get an education, and more will remain in China. As this happens, China will be able to transition to the next phase—a high-tech and services economy.

But China will also have to develop its information-age infrastructure. The United States has 625 personal computers per 1,000 people; China has 19. The United States spends \$2,924 per capita on information and communications

Table 3

Education, Science and Technology

	China	United States
Literacy rate	85.8%	97.0%
High school graduates aged 25+	18.0%	84.1%
College graduates aged 25+	5.2%	25.6%
University students (per 10,000 population)	56	541
Personal computers (per 1,000 population)	19	625
Information and communication technology expenditure per capita (\$U.S.)	\$53	\$2,924
Scientists and engineers in R&D (per million people)	473	4,099
Scientific and technical journal articles	11,675	163,526
Secure Internet servers	184	78,126
Internet users (per 1,000 people)	26	501

SOURCES: China: High school graduate, college graduate: National Bureau of Statistics; university students: *China Statistical Yearbook*, National Bureau of Statistics. U.S.: Literacy rate: *The World Factbook*, U.S. Central Intelligence Agency; high school graduate, college graduate, university students: U.S. Bureau of the Census. All other data are from *World Development Indicators*, World Bank.

technology annually; China spends \$53. The United States has nine times the scientists and engineers engaged in research and development. China has 184 secure Internet servers; the United States, 78,126. The United States has 20 times as many Internet users per capita (*Table 3*).

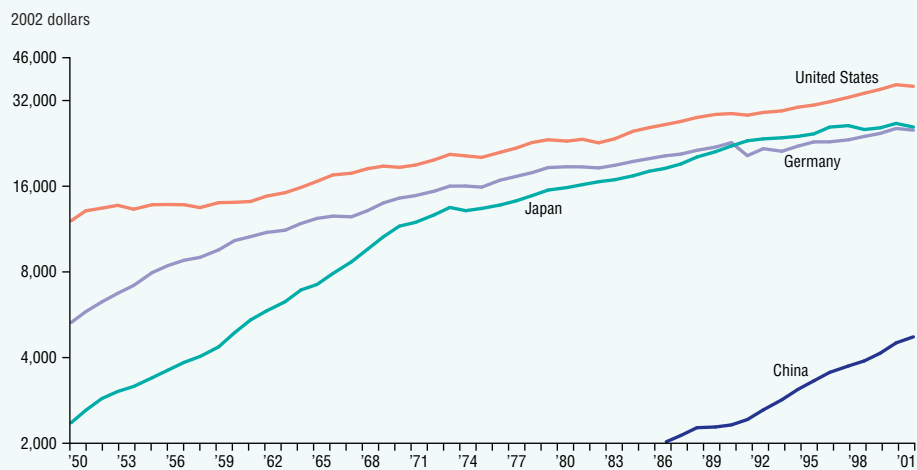
Right now, China's labor force is allocated between agriculture, industry and services roughly as America's was in 1882. This does not mean, though, that it will take China 120 years to reach current U.S. living standards. Just as it's easier

to walk through a jungle on a path others have already cut, followers can grow faster than leaders through technology transfer.

Currently, China's per capita GDP (purchasing-power-parity-adjusted) is roughly \$4,800—about one-eighth that of U.S. levels (*Chart 8*). That's an income roughly equal to 1901 America's. But regardless of whether China's living standards ever fully catch up with the United States', the massive change that's occurring in China will have profound

Chart 8

Catch Us If You Can Per Capita GDP, 1950–2001*



* Purchasing-power-parity-adjusted.

SOURCES: Maddison, Angus (2001), *The World Economy: A Millennial Perspective*, Organization for Economic Cooperation and Development, Table C; *World Development Indicators*, World Bank.

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effects on the world economy for decades. Certainly the post-World War II development of Japan and Germany greatly affected other nations, even though Japan and Germany never fully converged to our living standards and even though the two countries' combined labor force is only 110 million—one-seventh the size of China's. One would expect the magnitude of China's influence on the world to be much greater.

Conclusion

China is at an intersection of yesterday and tomorrow. Just a quarter century ago, China was a largely agricultural nation—isolated, less educated and stagnant. But today, China is rapidly transforming itself into an industrial nation and thereby raising its population's living standards. To progress much further beyond this stage and toward the heights of modern nations, China must develop its knowledge and service base—which it is doing. China's full transformation can happen; it probably will happen; indeed, it already is happening in China's modern cities—Shanghai, Beijing, Qingdao, Guangzhou, Nanjing, Shenzhen and so on.

The lifestyle China's youth will grow to enjoy will be far above what previous generations have ever known. And as China grows, the world will be a richer place as well.

—W. Michael Cox
Jahyeong Koo

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Notes

The authors wish to thank Dong Fu, Fanying Kong and Julia Kedrova for their excellent comments and assistance with data. We also received helpful comments from Evan Koenig and Mark Wynne.

¹ There is an ongoing debate regarding the reliability of China's GDP data. However, even skeptics of China's high GDP growth rates do not deny that China has had markedly higher growth following the reforms of 1978.

² Joseph Schumpeter (1939), *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*, vol. 1, p. 101. Schumpeter also recognized the power of emerging markets to create a new economic order when he wrote, "The opening up of new markets, foreign or domestic... revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist

concern has got to live in" (*Capitalism, Socialism, and Democracy*, orig. pub. 1942, 1950 ed., p. 83).

³ Manufacturing is by far the largest industrial component. In the United States, roughly 68 percent of industry workers are in manufacturing, 2 percent in mining and 30 percent in construction. In China, the manufacturing figure is 66 percent; in Mexico, 80 percent.

⁴ Figures are in current U.S. dollars.

⁵ Using labor force and purchasing-power-parity-adjusted output statistics from combined industry (manufacturing, mining and construction) as reported by the World Bank, productivity in Chinese industry is 19.2 percent that of U.S. industry and 78 percent of Mexican industry.

⁶ In 2001, the market capitalization of China's 1,154 companies listed on its domestic stock exchanges was just \$542 billion, whereas the 6,355 domestically listed U.S. companies were valued at \$13,984 trillion, according to the World Bank.

⁷ Many economic models would yield the result that world prices would fall as a large country like China comes on the economic scene. One simple such model is comparative advantage, as illustrated in "The Fruits of Free Trade," Federal Reserve Bank of Dallas *2002 Annual Report*, exhibit 2, p. 7. In this model, world production of shoes and soybeans (the two goods used for illustration) rises by 150 percent and 43 percent, respectively, as China and the United States move from autarky to free trade. The overall dollar price index (the monetary cost of the base-year consumption bundle) falls by 30 percent in the United States, and the yuan price index falls by 60 percent in China.

In general, extending specialization and trade creates both relative and absolute price effects, but absolute prices tend to fall, which lowers the overall price index. The lower prices in each country are accomplished not just through added production, but through trade—each country importing the good that its trading partner produces most efficiently. It is in this context that we treat the import of Chinese goods as lowering U.S. prices—that is, reflecting not merely a relative price effect (the price of imports versus domestically produced goods) but an increase in world output and consumption as production shifts to lower-cost producers.

⁸ Wal-Mart's share of 2002 sales among the 100 leading retailers was 20 percent (\$246.5 billion of \$1,236.2 billion). Few, though, would doubt Wal-Mart's ability to exert downward pressure on its competitors' prices by making those suppliers more efficient as well.

⁹ The five and one-half year time horizon is chosen because of data availability. Price statistics on all the products in Chart 7 are available beginning in January 1998.