

China's Emergence as a Manufacturing Juggernaut: Is It Overstated?*

BEHZAD KIANIAN AND KEI-MU YI

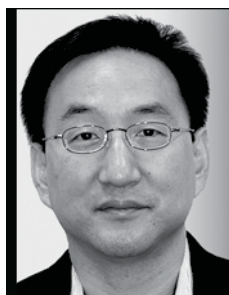
China's emergence as a manufacturing juggernaut selling so many goods to so many countries has attracted enormous attention from academics, policymakers, and the media. In this article, Behzad Kianian and Kei-Mu Yi put China's manufacturing performance into a broader context. They emphasize two key themes: The wages of China's manufacturing workers are rising rapidly; and China's production of export goods relies heavily on imported inputs and the final exported goods face large mark-ups in their destination markets. The first theme implies that China will lose global market share in some categories of goods. The second implies that China's trading relationship with many countries is complementary, not competitive, and that the omnipresence of China's goods exaggerates the extent of its manufacturing performance. The authors conclude that China's emergence as a global manufacturing power should not be overstated, and concerns that China will "take over" all manufacturing markets are unfounded.

conditioners, and from telephones to personal computers. China's emergence as a manufacturing juggernaut selling so many goods to so many countries has, of course, attracted enormous attention from academics, policymakers, and the media. Much of the media coverage conveys a tone of concern and consternation at this rapid emergence.

The purpose of this article is to put China's manufacturing performance into a broader context. The key themes we emphasize are that the wages of China's manufacturing workers are rising rapidly and that China's production of export goods relies heavily on imported inputs; these goods also face large mark-ups in their destination markets. The first theme implies that China will – and, in fact, has already begun to – lose global market share in some categories of goods. The second theme implies two important points. First, China's trading relationship with many countries is a complementary one, as opposed to a competitive one. Second, the omnipresence of China's goods exaggerates the extent of its manufacturing performance. Hence, we conclude that China's emergence as a global manufacturing power should not be overstated, and concerns

These days it's difficult to think of manufactured goods that are not made in China. If a product is smaller than

an automobile, it seems, it must have been made there. China has indeed become an important, if not dominant, supplier in global markets for literally thousands of goods, ranging from dolls to athletic shoes, from bicycles to furniture, from steel to air



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*The views expressed here are those of the authors and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

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that China will “take over” all manufacturing markets are unfounded.

OVERVIEW OF CHINA'S ECONOMIC PERFORMANCE

Before delving into our two primary themes, we believe it is useful to review China's economic performance overall and in manufacturing, including production and exports, during the past three decades. We will *not* discuss the theories and hypotheses for China's

performance; an explanation for China's success is a very important but as yet unanswered question. However, see *Three Important Policy Reforms*, for a brief description of three key reforms that facilitated the rapid development of China's manufacturing sector.

GDP and Manufacturing Production and Exports. The broadest measure of a nation's economic performance is its gross domestic product (GDP). GDP can be measured in three ways. We find

it useful to mention the “product” approach to GDP, which defines GDP as the sum of each firm's “value-added” – the market value of production minus the cost of materials and inputs – in a country in a particular time period, such as a quarter or year.¹ A

¹ GDP also includes the economic “output” of local, state, and federal government. For the alternative accounting of GDP, it is useful to think of the government as a large firm that produces services, such as education, police and fire protection, and so forth.

Three Important Policy Reforms

C

hina has implemented numerous economic policy reforms since 1978. We give a brief overview of three important trade and foreign direct investment reforms that have been the most relevant for China's manufacturing production

and trade. Much of the description below is from the study by Nicholas Lardy and another by Lee Branstetter and Lardy.

Probably the single most important trade policy reform was the establishment of an export processing regime. In an export processing regime, raw materials, parts and components, and other intermediate goods can be imported duty-free as long as they are used to produce export goods. According to Lardy, this regime was developed between the late 1970s and the late 1980s. This regime greatly facilitated the ability of China's domestic and foreign-owned firms to compete in world markets.

Second, China has reduced its tariff barriers, and it has become integrated into the official world trading system. During the 1980s, official tariff rates were as high as 56 percent, but because of the export processing regimes, actual tariff collections fell sharply. By 1992, actual tariffs collected represented less than 5 percent of total imports. China began sharply reducing its official tariff barriers during the 1990s. They fell to 15 percent by 2001.

In addition, the U.S. granted China “most favored nation” status in 1980. This was important because most favored nation status meant that China had the same access to U.S. markets as Canada, Mexico, Europe, Japan, and other countries that were signatories to the General Agreement on Tariffs and Trade (GATT).^a China officially joined the World Trade Organization (WTO) in 2001. Hence, China lowered its own tariffs, and its most favored nation status and entry into the WTO meant that its goods faced lower tariffs.

Third, China implemented policies to encourage foreign direct investment beginning in 1979. That year, a legal framework for joint ventures was established, along with four special economic zones in which “foreign firms were offered preferential tax and administrative treatment.”^b In 1984, the number of special economic zones was expanded by 14. In 1986, foreign direct investment that was export-oriented and technologically advanced became eligible for additional special benefits.

A key feature of these reforms is that machinery and equipment could be imported duty-free, as well. These policies facilitated a surge in inflows of both financial capital and physical capital so that in recent years China received more foreign direct investment than the United States. Importantly, the influx of technology associated with this foreign direct investment allowed China to produce more sophisticated products more rapidly than otherwise.

^a The General Agreement on Tariffs and Trade was the precursor to the World Trade Organization.

^b See the article by Lee Branstetter and Nicholas Lardy, p. 11.

second way to measure GDP is the more familiar – to anyone who has taken a course in macroeconomics – expenditure approach, which measures GDP as the sum of four major categories of spending on final goods: consumption (C), investment (I), government purchases (G), and net exports, or exports – imports (X-M). These two ways are related in that the market value of goods and services produced in a given period must equal the amount that is spent on those goods. The measurement of China's GDP has sometimes generated controversy. (See *Measurement of China's Real GDP*, for a discussion of some of the issues.)

With this caveat in mind, we will proceed. The growth rate of a country's GDP is a simple way to measure how rapidly a country is developing. Also, the growth rate of a country's GDP per capita is a simple way to measure how rapidly a country's living standards are rising.²

Since 1978, when major economic reforms were first introduced, China has experienced very high growth rates of its GDP. In at least 14 of these years, annual GDP growth exceeded 10 percent. Since 1980, China's economy has increased more than 10-fold and more than 400 percent since 1987 alone. By comparison, from 1987 to 2006, the economies of the United States and Japan grew only 76 percent and 46 percent, respectively.

How large a share of the world economic pie does China produce? When converted to dollars at current exchange rates, China's GDP as a

²Both growth rates are important and useful indicators. However, they are imperfect indicators of a country's overall development, which would also include indicators of health, poverty, and education, for example. For more on China's contribution to global economic inequality, see the article by Keith Sill.

Measurement of China's Real GDP

I

n emerging market economies, the prices of many goods and services tend to be lower than in the United States, for example, when the prices are converted at current exchange rates into dollars. To appropriately compare standards of living across countries, we must compute an alternative measure of GDP — a purchasing power parity (PPP) measure. The PPP measure of GDP adjusts for the price differences across countries. Because prices tend to rise with income, so that high-income countries also have high prices, PPP measures have the effect of raising the GDP estimate for countries not as rich as the United States. For example, using the yuan/dollar exchange rate in 2005, China's GDP that year was about 5 percent of global GDP. Measured in PPP terms, it was 14 percent of global GDP.

Recently, the World Bank issued revised PPP estimates of national GDPs for more than 100 countries for 2005. The revised estimates were based on more complete data on prices of goods and services. A key result of these revisions was that China (and India) had its PPP estimates of GDP revised considerably downward; China's share of global GDP is now estimated to be 10 percent.

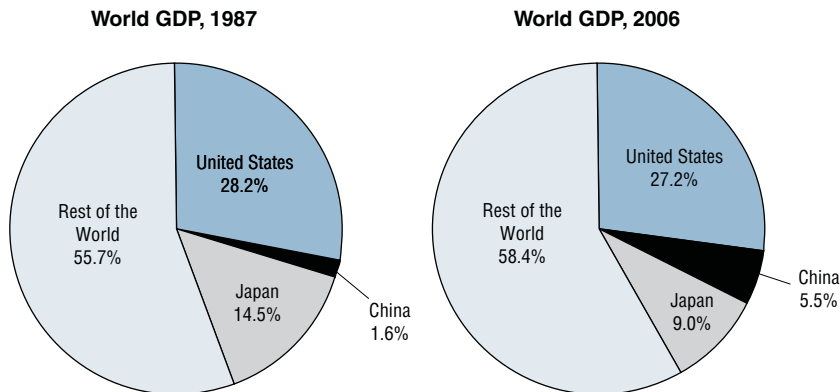
To the extent that prices and changes in prices are understated, this will overstate the level and growth rate of China's real GDP. However, mismeasurement of prices is unlikely to be occurring in the manufacturing sector because a large fraction of manufactured goods are goods sold on world markets. The possibility that prices are not measured correctly would presumably be less than for goods or services that are sold only in China.

share of world GDP has more than tripled since 1987, reaching 5.5 percent in 2006 (Figure 1). This made it the fourth largest economy in the world, after the United States, Japan, and Germany. Note, however, that China's economy is still considerably smaller than that of the United States. Also, the increase in China's share of world GDP is not unprecedented, as Japan experienced a similar jump between 1960 and 1979.

Fueling much of China's growth performance has been its manufacturing sector. As with countries like Japan, Taiwan, South Korea, Singapore, and Ireland before it, China's rapid economic development has gone hand-in-

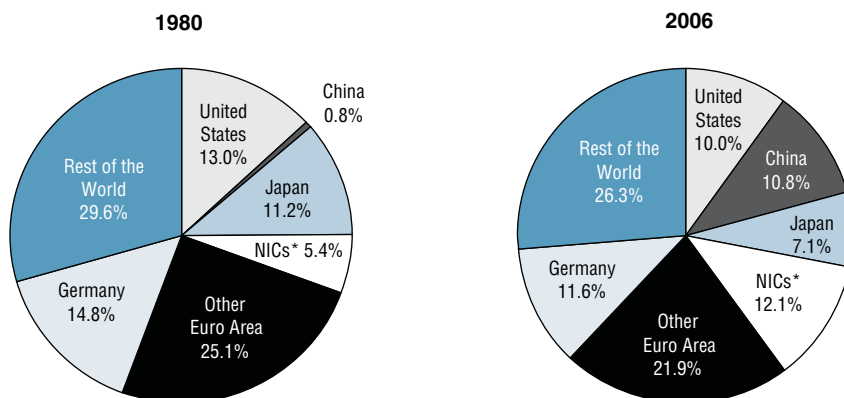
hand with extraordinary growth in manufacturing. According to the World Bank's World Development Indicator (WDI) database, China's share of the world's manufacturing value-added increased from 2.8 percent to 9.9 percent between 1991 and 2005.³ The United States remains the world's largest producer of manufactured goods, but the data suggest that China will surpass the United States by 2009 or 2010. Moreover, China is exporting an increasingly large share

³To put this large growth in perspective, consider another large emerging country, India. During the same period, India's share of world manufacturing value-added rose slightly, from 0.9 percent to 1.6 percent.

FIGURE 1**China's Share of World GDP**

Current Exchange Rates

Source: World Development Indicators

FIGURE 2**China's Share of World Manufacturing Exports**

Note: NICs = China, Hong Kong, Singapore, S. Korea, Taiwan

Source: World Trade Organization

of its manufacturing production. Manufacturing exports as a share of GDP have more than doubled: from 14.5 percent in 1991 to 33.8 percent in 2006.

On the world market for manufactured goods, Germany, the United States, and Japan have long been the dominant exporters of the

world's manufactured goods. Figure 2 shows how much the make-up of the world's manufactured exports has changed in the past quarter century. In 1980, China accounted for less than 1 percent of the world's manufactured exports, ranking 21st in the world, according to the World Trade Organization. In 2006, China exported

almost \$900 billion of manufactured goods, more than Japan and the United States, and 10.8 percent of the world total. Only Germany exported more.

Composition of China's Exports.

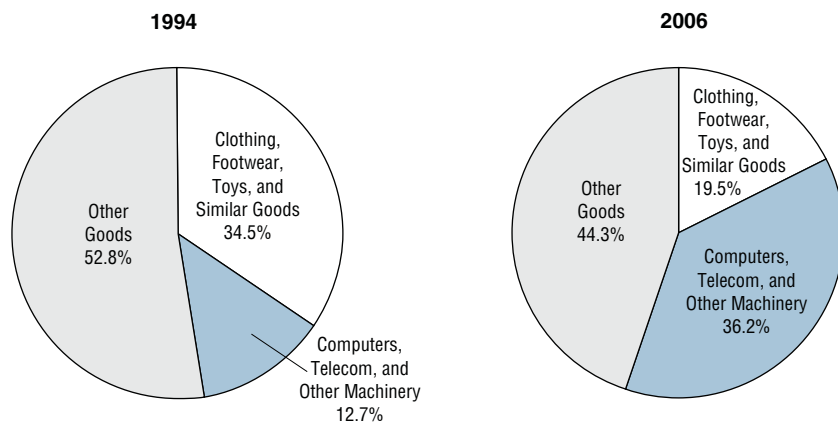
Moving beyond the aggregate picture, it is useful to present the evolution of the composition of China's manufacturing exports over time. China's abundance of labor has made it an appealing country for the production and export of labor-intensive goods such as footwear, toys, and apparel. In 1994, exports of these and similar goods accounted for over one-third of China's total exports and were almost three times the amount of China's exports of computers, telecommunications equipment, and other electric machinery (Figure 3). Over the next 12 years, exports of the traditional labor-intensive goods grew rapidly – China continues to be the world's leading exporter of many of these goods – but exports of the more high-tech goods grew even more rapidly — so much so, that by 2006, exports of the high-tech goods were almost twice as large as exports of traditional goods.

Tables 1, 2, and 3 present China's top 10 exports for three years: 1992, 1999, and 2006.⁴ They clearly show the evolution of China's exports from toys, footwear, and clothing to electronics and other telecommunication devices, including cell phones and computers. Thus, China's manufacturing performance of the past 15 years has been characterized not only by an enormous increase in exports and in

⁴These data come from the United Nations Comtrade database. They are categorized under the Standard International Trade Classification (SITC) system, Revision 3. We use the four-digit level of categorization, which contains approximately 600 categories.

FIGURE 3

China's Exports Shifting from Traditional Goods to Machinery



Source: UN Comtrade, SITC, Rev. 3

TABLE 1

China's Top Exports, 1992

Top Chinese Exports to World, 1992	% of Exports
Petroleum oils, crude oil	3.3%
Toys	2.8%
Jerseys & similar articles	1.9%
Footwear, leather uppers	1.6%
Pants, men's	1.5%
Other maize, unmilled	1.4%
Other radio-broadcast receivers	1.4%
Bed, table, toilet, and kitchen linen	1.3%
T-shirts & vests	1.3%
Dress shirts, men's	1.2%
Other footwear	1.1%

Source: UN, SITC, Rev. 3

world market share but also by a steady shift toward exporting more high-tech goods in the realm of electronics and telecommunications equipment.

There have been more formal and in-depth analyses of the

transformation of China's exports over time. In his article, Peter K. Schott uses highly disaggregated U.S. import data to examine the "sophistication" of China's export bundle and how it has changed over time. Schott compares

the Chinese export bundle to the U.S. with that of the Organization for Economic Cooperation and Development (OECD), a group of developed economies. Schott's measure of sophistication is an export similarity index, which is equal to 1 if two countries in a given year have the same set of export goods and each good's share of total exports is the same across the two countries. At the other extreme, the index is 0 if the two countries have no export goods in common. China's index number quadrupled between 1972 and 2005, rising from 0.05 to 0.21. Moreover, China's rank in sophistication among developing countries rose from 19th in 1972 to fourth in 2005. Schott finds that while China's sophistication is consistent with a country of its size, it is unexpected given China's level of development.

Dani Rodrik finds equally compelling results about the relative sophistication of China's exports. Rodrik uses an indicator that "measures the productivity level associated with a country's export basket." Rodrik finds that compared to other countries, China is a major outlier. In 1992, for example, the productivity level associated with China's export basket corresponded to countries with six times the per capita income of China. Though the number has shrunk over time, to three times the per capita income of China in 2003, Rodrik finds that the initial high level has been fundamentally important to China's enormous growth.

The common thread in both Schott's and Rodrik's work is that the story of China's emergence as a manufacturing juggernaut is more than just an enormous increase in exports. Just as important, if not more so, is the increasing sophistication of China's exports. We now turn to

TABLE 2**China's Top Exports, 1999**

Top Chinese Exports to World, 1999	% of Exports
Children's toys	2.6%
Input or output units for computers	2.5%
Jerseys, pullovers, cardigans, waistcoats	2.0%
Parts, data processing machines	2.0%
Parts, telecommunications equip.	1.9%
Footwear, leather uppers	1.4%
Footwear, rubber/plastic soles/uppers	1.3%
Trunks, suitcases, etc.	1.2%
Plastic articles	1.1%
Storage units, data processing	1.1%
Pants, men's	1.1%

Source: UN, SITC, Rev. 3

TABLE 3**China's Top Exports, 2006**

Top Chinese Exports to World, 2006	% of Exports
Computers, etc.	4.5%
TV, radio transmitters, etc.	3.7%
Parts, data processing machines	3.4%
Parts, telecommunications equip.	3.2%
Input or output units for computers	2.7%
Electronic microcircuits	2.2%
Sound, video recording, etc.	2.2%
Liquid crystal devices; lasers	1.4%
Jerseys, pullovers, cardigans, waistcoats	1.3%
Television receivers, color	1.3%
Storage units, data processing	1.2%

Source: UN, SITC, Rev. 3

population means there is an almost limitless supply of labor available to work in factories. According to this story, the large labor force holds down wages and allows China to extend its manufacturing tentacles into ever more categories of goods – from the most labor-intensive to the most high tech – and ever more markets abroad. Figure 4 illustrates the flaw in this argument because, measured in dollars, China's manufacturing wage has risen at an extremely rapid rate since 1983. For example, it has increased by 232 percent between 1996 and 2006. By contrast the manufacturing wage in the United States rose by only 36 percent in the same period; wages in two countries competing more directly with China, Mexico and South Korea, rose by 60 and 81 percent, respectively.⁵

While this trend may be surprising to some, it is, in fact, a natural outcome of a rapidly growing economy supported by strong manufacturing. A hallmark of such economies is increased labor productivity, that is, output per worker. Increased labor productivity at the national level can arise from two broad channels. First, existing goods can be manufactured in a more efficient manner, or existing goods can be manufactured with more capital per worker. Second, there can be an increase in the production of "new" goods – goods that have not been manufactured by the country before – whose production makes very effective use of labor, so that labor productivity is high. These two channels result

⁵The source for the U.S., Mexico, and South Korea wage data is the Bureau of Labor Statistics' hourly compensation costs in U.S. dollars in manufacturing: www.bls.gov/news.release/ichcc.t02.htm. To facilitate a comparison with Chinese wages, these wages are not adjusted for inflation.

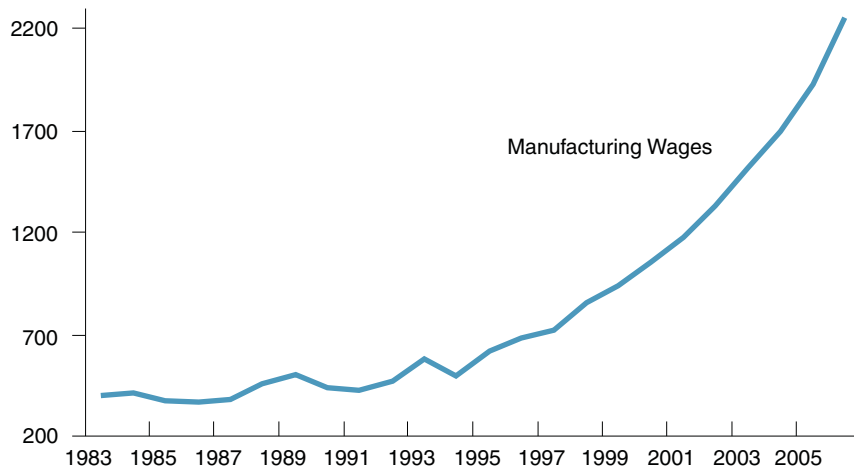
our first theme in putting China's manufacturing performance in context.

MANUFACTURING WAGES

One of the concerns expressed in the media is that China's huge

FIGURE 4**China's Manufacturing Wages Rising Rapidly**

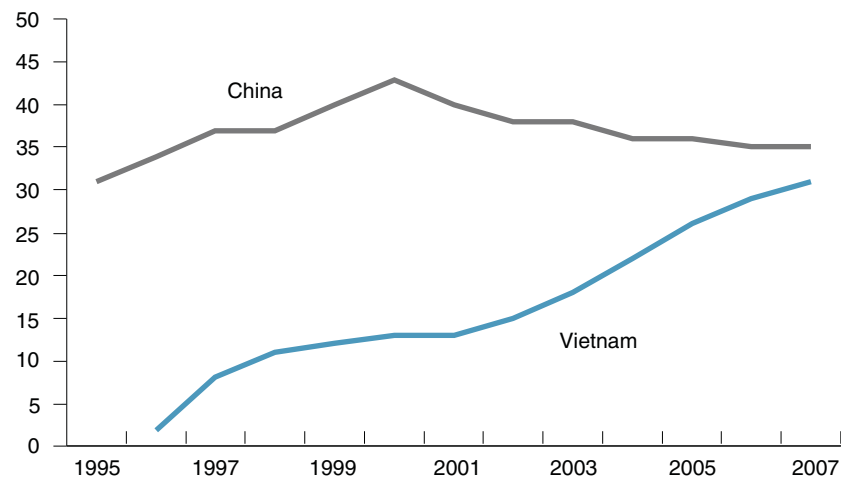
U.S. \$ (annual)



Source: CEIC, IMF

FIGURE 5**Share of Nike Footwear Production**

Percent



Source: Nike Annual Reports

in higher wages for workers in most market-oriented economies. China's manufacturing sector tends to be more market-oriented than other sectors of its economy because a large fraction of its production is sold in world markets.

What does the trend of rising manufacturing wages imply for China's

manufacturing performance? The primary consequence is that China is becoming less competitive at producing goods that other countries, such as Vietnam or Bangladesh, are also producing. This would apply, in particular, to clothing, footwear, and toys, and similar types of goods.

To illustrate this phenomenon, consider one of the most prominent athletic shoe companies, Nike. During the 1980s a large share of Nike's production took place in countries such as South Korea. However, as South Korean wages rose, Nike sought other countries in which to produce its products. In the 1990s, Nike increasingly located its production in China (Figure 5). However, after 2000 – likely owing to China's rising wages – this share has declined. Meanwhile, Nike has found Vietnam increasingly attractive. From 1995 to 2007, the share of Nike's production in Vietnam rose from less than 1 percent to 31 percent; its current share is now second to China's.

Looking at footwear more broadly, we see a similar pattern. While China's share of total U.S. imports of footwear continues to grow, it is at a slower rate than before. On the other hand, U.S. imports of Vietnamese-made footwear are growing rapidly. Between 2002 and 2006, for example, China's share of U.S. imports rose from 67 percent to 73 percent, while Vietnam's share more than tripled from 1.5 percent to 5.1 percent. The evolution of both China's share of Nike's production and of China's overall footwear share is illustrative of a larger phenomenon in which rapidly growing economies like China are also experiencing rapidly growing wages.

To summarize, the picture we want to paint in this section has two brush strokes. The first is that a key effect of China's increasing manufacturing prowess is that manufacturing wages are rising rapidly. The second is that rising manufacturing wages are leading China to lose market share for some types of manufactured goods (and also likely leading China to develop the ability to produce and export more sophisticated goods). To be sure, the

types of goods for which China is losing market share are not the areas in which the U.S. competes with China. Our main point is that the gains in manufacturing prowess overall lead almost inevitably to declines in some types of manufactured goods.

CHINA'S IMPORTED INPUTS AND EXPORT MARK-UPS

We begin by first providing two examples of China's market penetration that some commentators find worrisome. The total number of goods that the United States imported from China doubled between 1989 and 2001, and the share of the total number of goods increased from 40 percent to 62 percent.⁶ In other words, China had a presence in more than

⁶ A "good" is defined as a Harmonized Tariff Schedule (HTS) 10-digit good. See www.usitc.gov. We thank Christian Broda for providing these data to us. See the article by Broda and David Weinstein.

three-fifths of all U.S. markets for goods by 2001. Only three countries had a larger presence in U.S. markets. To be sure, a presence in a large number of markets does not necessarily mean that China is exporting a large dollar amount in each market. However, in dollar terms, only three countries exported more to the United States in 2001, suggesting that China's presence in many or most markets is comparable to that of the other major countries exporting to the United States.

Tables 4, 5, and 6 show the top 10 exports by China and South Korea for 1992, 1999, and 2006.⁷ They have become more similar over time. In 1992, only one industry was a top 10 export industry in both countries. In

⁷ As with the earlier top 10 export data on China, these data are from the United Nations Comtrade database and follow the SITC, Rev. 3 categorization.

1999, there were three industries, and in 2006, there were six industries that were in the top 10 in both countries.

China's Imported Inputs. The above examples suggest that China is increasingly competitive with countries such as the U.S. and South Korea, as well as other countries such as Japan and Germany. However, a key feature of Chinese production of its export goods is that the production relies heavily on imported intermediate goods, such as parts and components. We present two pieces of data on this issue. Data from the CEIC database indicates that in recent years, about 40 percent of China's imports are intermediate goods that are used directly to produce China's exports.⁸ In addition, a study by Robert Koopman,

⁸ This is a comprehensive database of national accounts, trade, industry, financial, employment, and other data for many countries. See www.ceicdata.com.

TABLE 4

China and South Korea in 1992

Top S.K. Exports to World, 1992	% of Exports	Top Chinese Exports to World, 1992	% of Exports
Electronic microcircuits	8.1%	Petroleum oils, crude oil	3.3%
Ships, boats, etc.	5.4%	Toys	2.8%
Fabric, synthetic yarn	4.1%	Jerseys & similar articles	1.9%
Motor vehicles	3.3%	Footwear, leather uppers	1.6%
Footwear, leather uppers	2.4%	Pants, men's	1.5%
Input or output units for computers	2.1%	Other maize, unmilled	1.4%
Television receivers, color	1.9%	Other radio-broadcast receivers	1.4%
Sound, video recording, etc.	1.8%	Bed, table, toilet, and kitchen linen	1.3%
Leather apparel, accessories	1.7%	T-shirts & vests	1.3%
Flat-rolled products of iron and steel	1.7%	Dress shirts, men's	1.2%
Containers	1.5%	Other footwear	1.1%

Source: UN, SITC, Rev. 3

TABLE 5**China and South Korea in 1999**

Top S.K. Exports to World, 1999	% of Exports	Top Chinese Exports to World, 1999	% of Exports
Electronic microcircuits	12.4%	Children's toys	2.6%
Motor vehicles	6.9%	Input or output units for computers	2.5%
Ships, boats, etc.	4.6%	Jerseys, pullovers, cardigans, waistcoats	2.0%
TV, radio transmitters, etc.	2.6%	Parts, data proc. machines	2.0%
Input or output units for computers	2.6%	Parts, telecommun. equip.	1.9%
Fabric, synthetic yarn	2.3%	Footwear, leather uppers	1.4%
Parts, data proc. machines	2.2%	Footwear, rubber/plastic soles/uppers	1.3%
Gas oils	2.1%	Trunks, suitcases, etc.	1.2%
Gold, nonmonetary excl. ores	2.1%	Plastic articles	1.1%
Parts, telecommun. equip.	1.8%	Storage units, data processing	1.1%
Liquid crystal devices; lasers	1.7%	Pants, men's	1.1%

Source: UN, SITC, Rev. 3

TABLE 6**China and South Korea in 2006**

Top S.K. Exports to World, 2006	% of Exports	Top Chinese Exports to World, 2006	% of Exports
Motor vehicles	9.4%	Computers, etc.	4.5%
Electronic microcircuits	7.8%	TV, radio transmitters, etc.	3.7%
Ships, boats, etc.	6.1%	Parts, data proc. machines	3.4%
TV, radio transmitters, etc.	5.3%	Parts, telecommun. equip.	3.2%
Parts, telecommun. equip.	4.5%	Input or output units for computers	2.7%
Liquid crystal devices; lasers	4.5%	Electronic microcircuits	2.2%
Parts of motor vehicles	2.9%	Sound, video recording, etc.	2.2%
Parts, data proc. machines	2.7%	Liquid crystal devices; lasers	1.4%
Input or output units for computers	1.8%	Jerseys, pullovers, cardigans, waistcoats	1.3%
Cyclic hydrocarbons	1.5%	Television receivers, color	1.3%
Electrical machines and apparatus	1.4%	Storage units, data proc.	1.2%

Source: UN, SITC, Rev. 3

Zhi Wang, and Shang-Jin Wei develops a methodology to accurately compute the value of imported intermediate goods directly and indirectly embodied in exports. Indirect embodiment occurs if, for example, an imported intermediate is used to produce another intermediate good, which is then used as an input to produce the exported good. Koopman, Wang, and Wei report two interesting findings. First, up to 50 percent of the value of China's exports consists of imported intermediates. Second, the imported intermediate content is higher for more sophisticated products, such as computers and telecommunication equipment.

These data suggest the following interpretation. Because China's production of its export goods relies so heavily on imported intermediate goods, the economic relationship between China and many of its trading partners may be more complementary than competitive. Indeed, in recent years, the export data suggest the development of an East Asian trading network in which intermediate goods are produced and exported from "emerging Asia" and Japan to China, where they are used to make final goods; the final goods are then exported to the United States.⁹ Between 1994 and 2006, emerging Asia's and Japan's exports to China rose 389 percent and 191 percent, respectively (Figure 6). In addition, China's exports to the United States rose 345 percent. By contrast, exports shipped directly from emerging Asia and Japan to the United States increased by far smaller percentages. These increases are so large that emerging Asia now exports

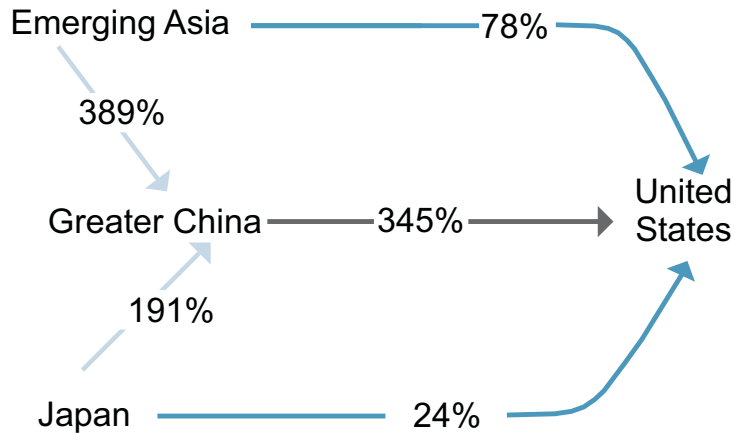
⁹ Emerging Asia includes South Korea, Taiwan, the Philippines, Singapore, Indonesia, Malaysia, and Thailand.

FIGURE 6

China Integrating into Asian Trading Network

Geography of Asian Trade

percent change, 1994 - 2006



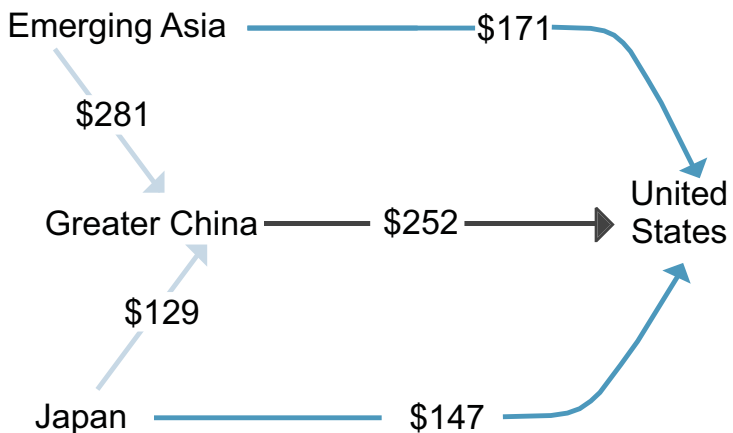
Source: IMF Direction of Trade Statistics, National Statistics (Taiwan)

FIGURE 7

China Integrating into Asian Trading Network

Geography of Asian Trade

\$U.S. billions, 2006



Note: Emerging Asia = S. Korea, Indonesia, Malaysia, the Philippines, Singapore, Taiwan, and Thailand

Source: IMF Direction of Trade Statistics, National Statistics (Taiwan)

almost twice as much to China as it does to the United States (Figure 7). For example, China has replaced the United States as South Korea's largest trading partner.

This network interpretation suggests that even though Table 6 suggests that South Korea and China are now heavily in competition with each other, the two countries are, in

fact, exporting different goods; that is, South Korea exports computer chips to China, which then uses them to produce computers. Furthering the complementary nature of its trade with other countries, China has also required capital goods such as machinery and equipment to fuel its growth in manufacturing. A large fraction of these goods are imported from its richer trading partners.

Mark-Ups on China's Export Goods. In addition to their high content of imported inputs, Chinese exports often have large mark-ups once they arrive in their destination country. Mark-ups include wholesale distribution costs, retailing costs, and profit margins. Each of these mark-ups is an essential part in the process of coordinating the delivery and ensuring the quality of a manufactured good to a consumer. The profit margins can be thought of as the return to investment in the good's intangible asset capital. The investment could be the costs associated with developing a new type of shoe, for example, and the intangible asset capital would be the shoe's brand name. Many Chinese-made goods carry U.S. brands.

Footwear is an excellent example of this. In 2007, U.S. consumers spent \$59.2 billion on shoes. Close to 100 percent of U.S. expenditure was on imports.¹⁰ As discussed above, about three-fourths of the imports are from China. But U.S. imports of shoes in 2007 were about \$20.4 billion. The difference between the U.S. consumer expenditure value and the value of imports is the retail and wholesale costs, transportation costs, and profit

¹⁰ In 2003, 99 percent of all footwear purchased in the U.S. was imported. In 2002, it was 98 percent. In 2004, the U.S. Census Bureau discontinued its surveys of U.S. footwear production.

margins. The numbers indicate that these costs and margins are about twice as large as the value of the imported shoes!

Putting the imported input content and large mark-up forces together suggests that Chinese "value-added" – the value of production less the cost of inputs, that is, wages to workers plus the rents paid to capital – in "made in China" goods is not large. For footwear, Chinese value-added on the roughly \$45 billion of expenditure on Chinese-made shoes was on the order of \$7.5 billion or less, or about 17 percent of the expenditure.

It is likely that the retail, wholesale, and transportation costs and profit margins are not as high for other U.S. imports from China as they are for footwear. Consider a hypothetical case in which these costs and margins are the same as – rather than twice as large as – the value of the imported goods. In 2007, the U.S. imported \$322 billion worth of goods from China. Hence, in this hypothetical case, U.S. consumers spent \$644 billion on "made in China"

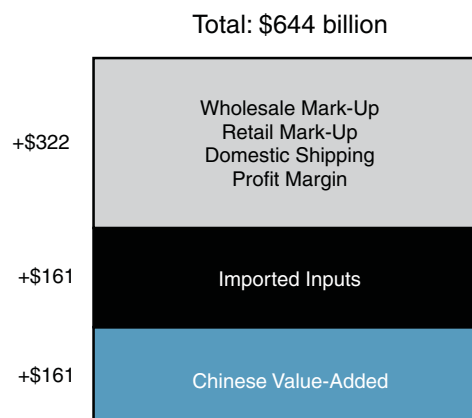
goods, equivalent to 36 percent of all U.S. consumer expenditure on merchandise other than food, fuel, and automobiles. However, only about \$160 billion of this expenditure represents Chinese value-added (Figure 8).

CONCLUSION

Our main theme is that while China's manufacturing growth has been spectacular – China will undoubtedly become the largest manufacturing nation in the world within a few years – some of the existing data on its performance overstate the extent of China's current importance in the world economy. We demonstrated this by showing that China's manufacturing wages are rising rapidly, both in absolute terms, and relative to other nations, which means it is losing its status as the preferred location of production for some categories of goods, such as Nike shoes. Moreover, as wages continue to rise, China will need to continually produce more sophisticated goods that require the use of highly productive labor. We also showed that Chinese

FIGURE 8

U.S. Consumer Expenditure on Made in China Goods, 2007




Source: BEA, Authors' Calculations

export goods rely heavily on imported inputs and that these goods may have large mark-ups added on, so that the final sale price to the consumer of a “made in China” good exaggerates by several times the Chinese value-added to that price. Our conclusion is that the extent of the manufacturing juggernaut is overstated.

Our conclusion does not in any way diminish the current and growing importance of China in global markets. To give one example, between 2002 and 2007, the demand for oil in China – fueled by China’s high GDP growth rates – rose by two-and-one-half times more than it did in the United

States. This contributed to the global increase in the price of oil during this period. Moreover, China’s wages are not rising by accident. They are rising because the country is becoming more productive, as well as more capable of producing a wider range of goods, as well as higher quality goods.

If China follows the pattern of many other countries, eventually the manufacturing juggernaut may actually diminish in size. Many countries go through a “structural transformation” as they develop, in which large numbers of workers leave the agricultural sector and the share of agriculture in GDP falls. In addition,

the services sector grows as a share of total employment and GDP. Finally, the manufacturing sector typically increases in importance during the high growth years, but then falls in importance when the economy matures. For example, in the United States, manufacturing’s share in GDP has fallen steadily during the post-World War II period. In Japan, the manufacturing share of GDP peaked in the early 1970s and has fallen steadily since then. It is likely, then, that as China’s per capita income and wages rise to developed-country status, manufacturing will decrease in importance. 

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