Why Is China So Competitive?

Measuring and Explaining China's Competitiveness

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Abstract

This paper evaluates factors responsible for the competitiveness of China in the world economy and relative to its East Asian rivals. China has been highly successful in capturing world export markets. Chinese competitiveness is not just a matter of an undervalued exchange and extremely low labor costs. It reflects primarily the coincidence of favorable cost conditions with improvements in China's ability to produce products that meet world market specifications. These improvements are closely related to foreign participation in China's economy through foreign direct investment and joint venture enterprises.

Keywords: China exports, comparative advantage, competitiveness, purchasing power parity, exchange rate, undervaluation, international comparisons, foreign direct investment, joint ventures.

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In the past decade, the export performance of the Chinese economy has been phenomenal. The issue of Chinese competitiveness has expanded in scope from a regional question—"Why is China so competitive with respect to other East Asian exporters?"—to a worldwide question—"Why are Chinese goods so competitive in the world market? "

Some observers have expressed concern about the growing centralization of the world's manufacturing production in East Asia, and particularly in China. At issue are the implications for manufacturing employment and wages in the United States, Europe, and Japan where a large fraction of Chinese exports is directed. There has also been worry about the deflationary implications of cheap Chinese exports on the advanced countries? For example, a recent Japanese comment: "A situation, largely without precedent in the industrialization of other nations, is thus unfolding in China where there has been long-term economic growth without rising wages. Judging from the large surplus [of] labor in the hinterland, this situation could continue for about another decade. If so, the deflationary pressure on the global economy from China will continue. " (Kojima, 2002, p.22.) In the United States, China's exchange rate and its implications for (unfair?) competition have become a political issue as the US trade deficit with China has risen above $100 billion. In East Asia, China's competitiveness is being seen as responsible for shifts in production and foreign investment that have impeded growth in other countries in the region.

The present debate over Chinese competitiveness is reminiscent of 1980s worries about the American competitive losses to Japan. Yet, there are some important differences. In the 1980s, American concerns were of an increasingly wealthy Japanese economy that appeared poised to overtake the US as a leader in key technologies and in overall wealth and prestige (Prestowitz, 1988). In the current situation, it is instead the multinational corporations of the United States, Japan, and other advanced economies who are shifting their own production into China either through foreign direct investment or outsourcing. The issues are less about technological supremacy than they are about the implications for developed country economies of a continuing outflow of investment and labor market displacements from the associated shifts in production and trade.

Our primary concern will be about whether the phenomenon of Chinese competitiveness is primarily one of exchange rate undervaluation—that can presumably be remedied by appreciation of the Chinese exchange rate. Or, alternatively, does Chinese competitiveness reflect more fundamental changes in the production possibilities of a "new" Chinese economy?

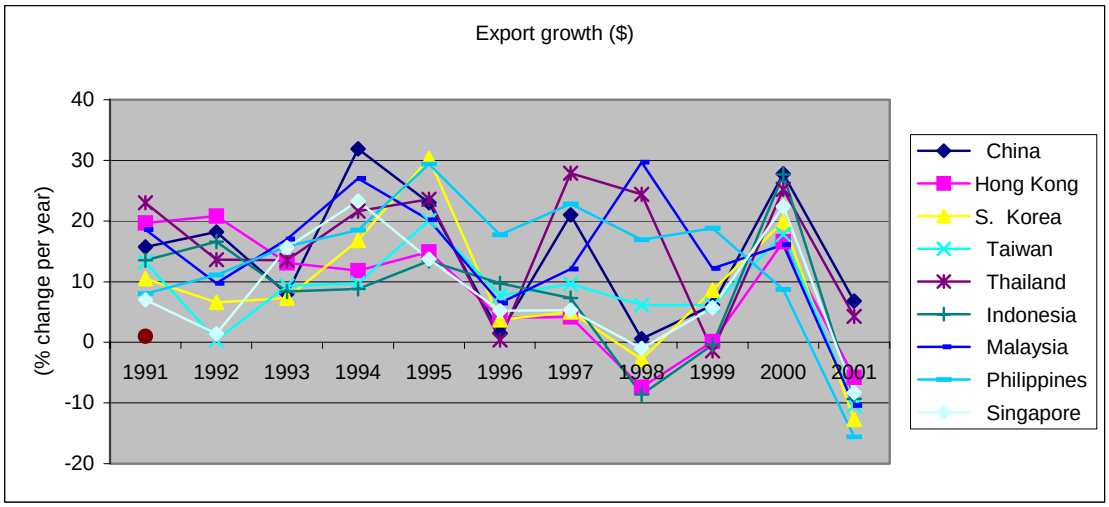
This paper considers China's competitiveness, its definition and measurement. In the next section we look at China's success in capturing world export markets. We then turn to a conceptual discussion of competitiveness and the practical challenges involved in its measurement. The following section looks at empirical indicators of Chinese competitiveness. An evaluation section summarizes findings and draws some tentative conclusions.

Chinese Export Performance

We begin by asking whether China has indeed been successful in its pursuit of international markets. In recent years, the record of Chinese exports has been spectacular, though cyclical. (Figure 1) Chinese exports have expanded in some years by 20 to 30 percent. Other East Asian countries have also shown rapid export growth but, despite substantial devaluations, in recent years many have lagged behind China (Table 1) In 2002, China accounted for $326 billion of exports, about 5 percent of world exports.

More recently Chinese exports have grown exceptionally rapidly, by 22.3% in 2002 and, apparently, at an even faster rate in 2003. Chinese exports were destined particularly to the United States,

growing at 15.6% per year from 1992 to 2001 While growth of Chinese exports to the European Union was slower, growth of exports to Japan was also rapid, 10.6% per year in the 1992-2001 period.



Chinese imports have also grown rapidly, but the Chinese trade balance has been substantially positive, amounting to approximately 10% of China's trade since 1994.

An alternative way to evaluate the development of exports is to see them as a share of world trade (Table 3). The results are striking. China has shown a steadily increasing share of world exports.[2] Other East Asian countries show steady increases in their shares of world trade until 1995 and stable or slightly declining shares thereafter. Japan shows a growing market share until 1990, but loses share thereafter, presumably to East Asian competition. The United States shows substantial declines in market share (except in 1995-2000), and, in relative terms, now plays a considerably smaller role in world export markets than in 1970.

[2] Together China and Hong Kong account for 8.1% of world exports and 41 % of East Asian exports (except Japan) However, an important part of Hong Kong's exports represent re-exports of products produced in China.

Table 1: Exports 1970-2002 (billions of US $)

	1970	1980	1990	1995	2000	2002
◆World	298.4	1921.8	3377.6	5079.1	6387.5	6478
◆China	2.3	18.1	62.1	148.8	249.2	326
◆Hong Kong	2.5	19.8	82.2	173.8	201.9	200.1
◆S. Korea	0.8	17.5	65	125.1	172.3	162.8
◆Malaysia	1.7	11.1	29.4	74.1	98.2	88
◆Philippines	1	5.7	8.1	17.5	39.8	32.7
◆Thailand	0.7	6.5	23.1	56.5	69.1	65.1
◆Singapore	1.6	19.4	52.8	118.3	137.8	125.2
◆Indonesia	1.1	25.2	25.7	45.5	62.1	57.4
◆Taiwan	1.4	19.8	76.1	111.6	147.8	124
◆Japan	19.3	130.4	287.6	443.1	479.2	417.4
◆US	42.7	225.6	393.6	584.7	781.1	693.9

Source: IMF, *International Financial Statistics*

Table 2: Export Growth 1970-2002

(percent change p.a.)

	1970-1980	1980-1990	1990-1995	1995-2000	2000-2002
◆World	18.63%	11.28%	8.16%	4.58%	0.70%
◆China	20.63%	12.33%	17.48%	10.31%	13.43%
◆Hong Kong	20.69%	14.23%	14.97%	3.00%	-0.45%
◆S. Korea	30.85%	13.12%	13.09%	6.40%	-2.84%
◆Malaysia	18.76%	9.74%	18.49%	5.63%	-5.48%
◆Philippines	17.40%	3.51%	15.41%	16.43%	-9.82%
◆Thailand	22.28%	12.68%	17.89%	4.03%	-2.98%
◆Singapore	24.95%	10.01%	16.13%	3.05%	-4.79%
◆Indonesia	31.32%	0.20%	11.42%	6.22%	-3.94%
◆Taiwan	26.49%	13.46%	7.66%	5.62%	-8.78%
◆Japan	19.11%	7.91%	8.64%	1.57%	-6.90%
◆US	16.65%	5.57%	7.92%	5.79%	-5.92%

Source: IMF, *International Financial Statistics*

Table 3: Shares of World Exports (percent)

	1970	1980	1990	1995	2000	2002
◆China	0.77%	0.94%	1.84%	2.93%	3.90%	5.03%
◆ Hong Kong	0.84%	1.03%	2.43%	3.42%	3.16%	3.09%
◆S. Korea	0.27%	0.91%	1.92%	2.46%	2.70%	2.51%
◆Malaysia	0.57%	0.58%	0.87%	1.46%	1.54%	1.36%
◆Philippines	0.34%	0.30%	0.24%	0.34%	0.62%	0.50%
◆Thailand	0.23%	0.34%	0.68%	1.11%	1.08%	1.00%
◆Singapore	0.54%	1.01%	1.56%	2.33%	2.16%	1.93%
◆Indonesia	0.37%	1.31%	0.76%	0.90%	0.97%	0.89%
◆Taiwan	0.47%	1.03%	2.25%	2.20%	2.31%	1.91%
◆Japan	6.47%	6.79%	8.51%	8.72%	7.50%	6.44%
◆US	14.31%	11.74%	11.65%	11.51%	12.23%	10.71%

Computed from IMF, *International Financial Statistics*

The composition the exports of China and other East Asian countries (Table 4) provides some insight into the changing role of China in the world economy. Export composition reflects the traditional development ladder (Adams and Ichimura, 1998, Vernon, 1966) approach, starting with foodstuffs in the lowest income countries, then increasing strongly in the manufactured mass production products and finally turning to high tech and capital goods as the economy's productive power matures. Among the East Asian countries, China is the region's dominant exporter (China alone accounts for one third of the region's exports, over half if China and Hong Kong are combined.). While China's exports of manufactured mass production products continue to increase rapidly. 6.9 % per year in line with world market growth, more than in other East Asian countries, high technology exports were increasing at a rate of 15 % per year and already represented a 43% (China and Hong Kong) share of 2001 East Asian high tech exports even though China was not yet as technologically advanced as Korea or Singapore.[3] Since 2001 these patterns have continued.

3 Comparable statistics were not available for Taiwan.

Table 4 Growth of Exports 1995-2001 by merchandise class

		China		Hong Kong		Indonesia		Korea	
		Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01
1	Raw food	12,777	4.2%	2,304	-2.9%	3,252	-1.6%	2,204	-3.0%
2	Proc. Agric. Products	5,156	-3.0%	3,098	-9.5%	4,595	-6.1%	1,896	-0.5%
3	Fuels	8,405	7.6%	495	-20.4%	14,274	3.6%	8,038	19.6%
4	Industrial Materials	29,421	5.6%	15,724	-2.7%	4,630	7.1%	22,801	2.9%
5	Manufactures, mass production.	85,857	6.9%	56,566	-0.2%	17,164	1.8%	22,003	-2.0%
6	High Tech & Capital Goods	122,080	15.0%	112,944	4.1%	11,070	12.4%	93,492	3.9%
	Total	263,696	9.5%	191,131	1.6%	54,986	3.2%	148,316	3.2%
		Malaysia		**Philippines**		**Singapore**		**Thailand**	
		Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01
1	Raw food	1,734	-0.6%	1,302	-0.4%	1,547	-49.3%	9,712	-0.7%
2	Processed Agric. Products	5,571	-9.6%	889	-7.8%	2,093	-10.0%	2,670	-4.0%
3	Fuels	8,557	8.4%	272	-0.2%	9,243	2.2%	1,814	24.8%
4	Industrial Materials	6,124	6.1%	852	-0.9%	12,296	1.8%	5,757	8.2%
5	Manufactures, mass production	7,663	-0.6%	3,839	9.2%	4,082	-4.6%	11,555	-3.0%
6	High Tech & Capital Goods	58,355	4.5%	24,995	13.2%	91,919	0.9%	33,606	5.3%
	Total	88,004	2.9%	32,150	10.2%	121,179	-3.0%	62,204	2.8%

Source: United Nations Comtrade

A more detailed look is obtained by selecting sectors that can be called high tech and low tech at the "two digit" SITC level (Table 5). High tech exports from China like office machines, telecom, electric machinery and parts have been growing much more rapidly than traditional Chinese export products like clothing and footwear, though the latter remain quantitatively important. Hong Kong and Korea also show very rapid growth for telecom and Malaysia and Singapore for ADP. The growing high tech categories in China probably include a disproportionate share of relatively simple products, such as PCs and cell phones as well as parts, rather than highly sophisticated complex capital goods and chips.[4] Some of these exports represent a shift of production from neighboring countries, especially Taiwan and South Korea where costs have been rising. Growth in the traditional sectors is generally more modest, though China shows rapid growth in the clothing category.

[4] For example the 3-digit category 776 (Transistors and valves) accounts for $4.9 billion, though it too is growing rapidly at 22.3% per year.

Table 5 Growth of Exports 1995-2002, selected sectors

	China		Hong Kong		Indonesia		Korea	
High Tech Sectors	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01
SITC 75 Office machines, ADP	$23,572	26.5%	$17,747	10.0%	$2,063	23.6%	$28,534	-4.5%
SITC 76 Telecom	$16,770	14.1%	$7,041	46.1%	$27,230	-1.0%	$13,499	16.7%
SITC 77 Elec Machinery, Parts	$23,759	17.3%	$18,697	1.8%	$3,354	12.0%	$24,187	-2.6%
Low Tech Sectors								
SITC 83 Travel goods, handbags,	$12,170	-0.2%	$1,140	5.8%	$7,260	-9.7%	$15,944	9.8%
SITC 84 Clothing and accessories	$25,998	16.7%	$30,655	7.5%	$2,280	17.3%	$60,430	-3.4%
SITC 85 Footwear	$20,937	4.2%	$14,385	30.5%	$34,717	5.1%	$21,406	-4.8%
SITC 89 Misc. Manufactures	$4,378	-0.9%	$187	12.0%	$34	-2.1%	$19	-13.4%
	Malaysia		**Philippines**		**Singapore**		**Thailand**	
High Tech Sectors	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01	Mill of US $	%pa95-01
SITC 75 Office machines, ADP	$270	14.9%	$38	-8.0%	$233	-17.9%	$441	-0.4%
SITC 76 Telecom	$36,743	7.0%	$23,551	1.6%	$4,599	4.8%	$484	-2.1%
SITC 77 Elec Machinery, Parts	$2,071	-1.5%	$2,423	13.3%	$1,632	1.8%	$4,320	-2.4%
Low Tech Sectors								
SITC 83 Travel goods, handbags,	$9,676	7.2%	$5,575	-4.7%	$1,474	-5.1%	$29	-16.7%
SITC 84 Clothing and accessories	$84	-4.1%	$72	-12.6%	$112	-1.7%	$352	-21.1%
SITC 85 Footwear	$22,085	7.9%	$22,350	1.0%	$1,181	0.7%	$9,724	-0.8%
SITC 89 Misc. Manufactures	$2,014	1.1%	$514	-0.8%	$4,552	4.4%	$4,034	-0.3%

It is not possible statistically to measure the qualitative improvements that have increased the competitiveness of Chinese products. But, changes in the range of products being produced are suggestive of the developments that are taking place.[5]

To summarize, in comparison to other East Asian countries, China has become the dominant exporter and is increasingly shifting into the high tech sectors. It is important to note, however, that the high tech categories contain not only advanced technology but also simpler assembly activities required to build high tech products like telephones and PCs, an important part of Chinese export production.

Comparative Advantage and International Competitiveness

The explanation of international competitiveness by economists goes back many years to the theory of comparative advantage and factor pricing (Ricardo and Heckscher-Ohlin). While Ricardo focused on one

[5] Among recent articles that have documented China's export gains in capital-intensive and high tech export markets are Wong and Chan (2002), Chen (2001), and Voon and Yue (2003).

production factor and differences in technology (climate), Heckscher and Ohlin dealt with labor and capital inputs and justified comparative advantage on the basis of underlying differences in factor endowments and relative factor prices. This approach has been extended to many products and many factors (Dornbusch, Fisher, and Samuelson, 1977). In the modern theory of trade under imperfect competition, comparative advantage continues to play a central role in explaining trade patterns, although scale economies and strategic motives are also important (Helpman and Krugman, 1985). Ronald Jones (2000) has noted that absolute advantages may influence patterns of specialization if some inputs to production are mobile across borders.

Comparative advantage may lie at the heart of the theory of specialization and trade but it is not always closely related to real world discussions of competitiveness. First, comparative advantage is a microeconomic concept, focusing on industry-specific trade, explaining why one country might export labor-intensive products while another country might specialize in capital-intensive ones. By definition each country has a comparative advantage in the production of some products—those for which it has a lower relative (opportunity) cost than its competitors. Therefore, comparative advantage has little significance from a macroeconomic perspective. It is not meaningful to say that at any time country A in the aggregate has a comparative advantage over country B.

Second, comparative advantage is an equilibrium concept, predicting a pattern of trade when prices, trade flows and exchange rates are in equilibrium. Business decisions, in contrast, often must explicitly consider short-term developments as well as long term equilibrium outcomes. These will include current economic conditions, exchange rate fluctuations, and other factors that represent deviations from long-run equilibrium conditions.

Finally comparative advantage does not take specifically into account all the technological options available to the producers. At the microeconomic level, when dealing with specific products, it is not always clear from theory which country has the most favorable mix of resources and factor prices for various types of production. Depending on technology and infrastructure, a shortage of labor relative to capital which implies relatively high wage rates may be offset by differences in productivity. High wages may or may not translate into competitive disadvantage for labor-intensive products if alternative

technologies using less labor and more capital are available. For example, many products that are produced by hand in China are also produced, by machine, in the United States.

Competitiveness, a term used widely in the business administration literature (Porter, 1990), has been often been applied in Europe and the US to represent the failures or successes of the economy. By competitiveness we mean the ability under present conditions of a country's products to command world markets.

In contrast to comparative advantage, it is appropriate to talk meaningfully about international competitiveness both on the macro and micro level. International competitiveness is a matter largely of costs: which country is able to deliver the product to the market most cheaply. Contributing to costs are factors that directly affect input prices, such as exchange rates, domestic wages and material costs, and productivity, but also capabilities to produce goods of appropriate quality and meeting market specifications. Transportation and communication costs, and trade barriers and trade strategy may all play a role. Competitiveness is not an equilibrium concept. It represents a position at a point in time or its change over time. Since adjustment on the product supply side is likely to be very slow—it takes many years to establish production facilities and export markets—competitiveness typically refers to a time of disequilibrium when a country can increase its share of export markets. In other words, competitiveness often refers to dynamic rather than static perspectives.

Common usage of the term, competitiveness, is usually broader than would be implied by a formal definition. In particular, advocates for competitiveness often stress the role of sustained productivity growth in producing products that meet the test of international markets and that leads to higher living standards. (Porter 1990, Competitiveness Policy Council, 1992). It is in this context that the term has been embraced by politicians to represent the failures or successes of Western economies. But, the ability to command world markets (for a time) does not necessarily imply higher living standards. A country's products may be competitive because it has undervalued its currency. In that case, terms of trade may be unfavorable from a welfare point of view, goods may be exported cheaply in terms of the imports.

Nevertheless, the effects on trade and production are real, as are the necessary structural adjustments that go along with them.[6]

In contrast to comparative advantage, it is appropriate to talk meaningfully about international competitiveness both on the macro and micro level. At the macro level, a country's exports may be highly competitive in the destination countries or in comparison with products originating in other countries. That may reflect underlying factor cost and productivity considerations. It may also reflect the current exchange rate, undervaluation or overvaluation, as well as tariffs, transportation costs and trade restrictions as well as product quality and specifications. Competitiveness has dynamic attributes in the sense that, given resource environment, countries may become more competitive as a result of learning-by doing, assimilation of technology, capital accumulation, increasing scale of production, and policy intervention. Contrary to some thinking, it does make sense to think of a country's aggregate competitiveness and about policies intended to advance its competitiveness.

From a micro perspective as well, it is possible to ask whether certain industries are competitive in world markets. This calls for a cost comparison, at a prevailing exchange rate, involving such factors as wages and capital costs, scale of production, and, of course, productivity. As we have noted in the discussion of comparative advantage, some industries will be more suited to an economy's endowment of factors and skills than others. A dynamic improvement in competitiveness may mean that the competitiveness of currently exporting industries improves or that new products, perhaps technologically more advanced ones, become competitive.

Measurement of Competitiveness

The measurement of international competitiveness may be approached from a "results" or from a "causes" perspective. Results are basically export performance and the trade balance. These are *ex post*

[6] Paul Krugman (1994) criticizes the tendency to characterize competitiveness by imagining a nation "like a big corporation, competing in the world market place", a saying attributed to President Clinton. He argues that competitiveness is "a dangerous obsession" since it may lead to policy choices that are not clearly in the national interest—for example protectionism when foreign goods "threaten" local producers. He prefers an approach that looks only at productivity growth as a measure of national performance, but this ignores the key role that international trade (and competition) may play in driving productivity differences. (See Cohen, 1994.)

concepts and do not ask "why", though there is often an implied explanation. Growth of exports, particularly growth that is more rapid than in other countries, implies competitiveness. A positive trade balance is also frequently cited as a positive measure of competitiveness. Presumably, competitiveness reflects relative costs, but it may also be affected by product attributes and trade restrictions. This may lead to confusion. Thus, a country that is running a trade surplus, may be suffering outflows of capital and its undervalued exchange rate may make its exports competitive. It is not clear that this type of competitiveness is a good thing. Alternatively, a trade deficit may follow from a country's attractiveness to foreign investors whose capital inflow causes the exchange rate to be overvalued from the perspective of trade.

A classical results measure, focused on particular industries, was Balassa's "revealed comparative advantage" (RCA) (Balassa, 1965), the share of a country's exports of a specific product category (X_{ij}) to its total exports ($\Sigma_i X_{ij}$) as compared to the share of total world exports of the specific category ($\Sigma_j X_{ij}$) in world exports of all goods ($\Sigma_i \Sigma_j X_{ij}$),

(1) $RCA_{ij} = X_{ij/} /(\Sigma_i X_{ij})/ (\Sigma_j X_{ij})/ (\Sigma_i \Sigma_j X_{ij})$.

Balassa relates RCA measures to such underlying factors as capital intensity and human resource development (Balassa, 1979). The RCAs are sector specific and static. It is possible to make them dynamic by focusing on comparisons over time and in terms of rates of change. For example, growth of a specific export more rapidly than world wide growth of the specific product exports suggests competitiveness in the specific product.[7] Such a dynamic comparison is shown in Table 4, above.

One may want to measure international competitiveness directly, seeking the *causes* for of a country's or an industry's international trade success. The exchange rate is, of course, the most immediate measure of the terms of trade. However, the nominal exchange rate, though relevant to trade transactions, fails to take into account differences in domestic currency production costs. Comparisons of the temporal movement of real exchange rates can be computed by adjusting changes in nominal exchange rates for the underlying domestic price movements.

7 Other approaches to measure competitiveness, the Michaely index, a measure of relative net exports, or the X2 measure focus on somewhat different questions like trade balance and specialization (Laursen, 1998)

It is more difficult to establish comparisons of real competitiveness at a point in time in absolute terms, since they depend on the absolute levels of domestic input costs (or prices) and on productivity. Can the product be produced more cheaply in one country than in another? The basic ingredients for such a comparison need to be the exchange rate and the underlying costs in the trading countries. There are several possibilities:

- comparison of wage rates or capital costs,
- comparison of unit labor or unit capital costs, and
- comparison of unit total costs.

In each case, comparisons must be made in terms of currencies adjusted at nominal exchange rates since these rates apply to goods sold in international trade. Comparisons of wage rates or capital costs alone fail to allow for differences in productivity. And the differences due to production technology and its adaptation to local conditions are critical. Thus, factor cost computations call for unit cost comparisons. One may compare relative wages and relative productivities to ascertain competitiveness, for example:

(1) $(l/q) * w \; >< \; (l_f/q_f) * w_f / XR$

where (l/q) represents unit labor input, w represents the wage rate, the subscript f stands for the outside world and XR is the exchange rate (units of domestic currency per dollar). Given the exchange rate, one may determine labor competitiveness for individual industries on the basis of unit labor output statistics for separate industries.

Multifactor cost comparisons pose additional problems since the weights attached to the factor inputs are likely to differ between countries because of differences in relative factor cost. Production at different sites is likely to use different combinations of labor and capital: lots of labor where labor is cheap and capital expensive and capital intensive methods where capital is relatively cheap. That is, after all, what comparative advantage is all about. In that case, the total unit cost comparison should use the factor weights appropriate for each of the economies, i.e.

(2) $((l/q) * w) * W + ((k/q) * r) * (1 - W) \; >< \; (((l_f/q_f) * w_f) * W_f + (k_f/q_f) * r_f) * (1 - W_f)) / XR$

where k represents capital, r is the interest rate, and W stands for the labor share of inputs.[8] An added complication lies in the need to allow for intermediate inputs, sometimes coming from foreign sources.

The comparisons based on a single input, labor or capital, are feasible so long as appropriate data on wages or interest rates and data on output or on labor or capital productivity can be developed. Multi factor comparisons are more difficult because of the need for appropriate weights.

It is possible to approximate a multifactor comparison by making use of data from international comparison programs like the International Comparison Project (ICP) at the University of Pennsylvania and the International Comparisons of Output and Productivity (ICOP) of the Groningen Growth and Development Centre. The ICP work takes a final expenditure approach to purchasing power parity. It .has a long and distinguished history going back to Gilbert and Kravis (1954), Summers and Heston (1991) at the University of Pennsylvania, and more recently at the World Bank in association with other international organization. Survey-based prices for fully described comparable items in final demand, so-called specification pricing, are used to translate final demand components in the comparison country to US dollar values. The computation yields estimates for GDP in PPP $.

(3) $GDP_{PPP\$j} = \Sigma_i(Q_{io} * P_{ijPPP\$}) / Pop_j$

These can be compared with GDP on an exchange rate basis, sometimes called the Atlas method,

(4) $GDP_{XRj} = \Sigma_i(Q_{io} * P_{ij}) / Pop_j / XRj.$

The comparison between per capita GDP in PPP$ and on the basis of the exchange rate yields a measure of exchange rate over or undervaluation (U):

(5) $U_j = GDP_{XRj}/GDP_{ppp\$j} = \Sigma_i(Q_{io} * P_{ij}) / XR_j / Pop_j / \Sigma_i(Q_{io} * P_{ij} / PR_{iPPP\$}) / Pop_j = XR_{jPPP\$} / XR_j$

where $GDP_{ppp\$j}$ and GDP_{XRJ} are GDP per capita in purchasing power terms (prices are in PPP$) and in exchange rate terms (prices are in local currency but the total has been divided by the exchange rate), respectively. Pop_j represents population. The Q_{io}s are quantities. The quantity weights in this calculation differ greatly between the countries. It has been customary to use a Fisher average between estimates based on comparison country quantity weights and base country (usually the US) weights.

[8] Note that even though the weights (W) are country specific, there is no index number problem here. The comparison is between the cost of producing in one country and in another using the locally appropriate mix of labor and capital.

This approach provides a comprehensive measure of undervaluation based on a detailed appraisal of prices and on all inputs into the production process. However, for purposes of evaluating costs, a problem with this approach lies in the price measures. These are expenditure prices, since the purpose of the PPP comparison is to compare final output per capita. If PPP is to be used for productivity comparisons or production costs, the comparison should rather use input prices. Further difficulties are that the weights applied to the price measures may not be appropriate for production of traded commodities, and the quantity weights are not likely to be appropriate either for the base country or the comparison country. Indeed, one would like to use weights based on production inputs rather than on consumption.[9] Finally, detailed surveys have not available for some countries, including China! In this case, regression methods are used to estimate a statistic for China on the basis of related countries. This represents a serious shortcoming.

Nevertheless, in the absence of data on production structure and input prices, there is much to be said for such a measure. It represents a quick way to measure the undervaluation of a country's currency with respect to the nominal exchange rate, and it provides a rough benchmark for intertemporal studies on the movement of real exchange rates. Assuming that wages and GDP per capita are proportional, the measure may be thought of as single factor indicator of competitiveness. Alternatively, since it deals with a broad mix of products whose production calls for labor and capital and the resulting per capita income, it may also be seen as a multifactor comparison.

The sectoral value added approach also has a long history going back to Paige and Bombach (1959). The recent work under the auspices of ICOP has simplified the procedures and extended them to many country comparisons including ones for China (van Ark and Timmer, 2001, and Bai et al, 2001). This strategy is based on comparisons of producing sectors on the basis of industrial census data. Relative unit value indexes (UVR) by sector, computed by dividing sectoral value added by measures of quantity, are used to deflate sectoral output and to produce aggregates GDP in PPP terms for each sector, i.e..

$$(6)\quad GDP_{ppp\$j} = \Sigma_i \, (w_i VA_{ij} / (UV_{ij} / UV_{io})$$

[9] For a discussion see Kravis, Summers, and Heston (1978), and Summers and Heston (1996) and the many papers of the Penn International Comparison Project.

where the VA_{ij} are sectoral value addeds in the comparison country j, UV_{ij} and UV_{io} are the sectoral unit value indexes in country j and in the base country o respectively. The weights (w_i) are sectoral weights either for the comparison country or for the base country. These may be looked at separately or they are frequently combined with a Fisher index procedure. As in the expenditure based procedure, undervaluation can be computed by comparing the PPP based measure with the exchange rate based measure.

There are things to be said in favor and against the sectoral value added approach. The chief objections are that it makes use of unit values rather than prices for explicitly defined products and that in simplified procedures it uses sectoral ouputs rather than subtracting intermediate inputs, a likely source of errors. On the other hand, the sectoral approach has the advantage that it allows comparisons at the industry level. Moreover, these comparisons can be made directly between unit values in local currency and in US dollars, producing a sector specific implied exchange rate. This is a considerable advantage for evaluating competitiveness.

It is important also to note that there are important aspects of competitiveness that are not captured by either approach. These include costs of delivering products to world markets, including transportation, communication and coordination costs, as well as policy-related barriers or incentives to trade. In many countries government policy has favored export-oriented development, which may give a competitive edge to export enterprises. At the same time, market opening, for example the increasing presence of foreign firms in China that is set to take place now that China has been admitted to the WTO, gives extra incentives for foreign firms to set up production facilities in anticipation of greater market access in the future. Direct foreign investment is likely to be the most important contribution to competitiveness through the introduction of new production methods, world market product specifications, and advanced management procedures. These are measured only indirectly in the comparative price or unit value relatives data.

Determinants of Chinese Competitiveness

We apply the discussion above to measure the determinants of Chinese competitiveness. It is necessary to look at a variety of measures and to infer how they explain the competitiveness of Chinese products. As we have noted at issue is the role of the exchange rate versus other factors in explaining Chinese competitiveness.

Revealed Comparative Advantage

A picture of rapidly increasing Chinese competitiveness is apparent if we compute a dynamic form of revealed comparative advantage (RCA), comparing the growth rate of world trade of a specific country to the growth rate of world exports (Table 6). Note that an RCA in excess of one suggests that a country is competitive in world markets, i.e. that its share of world exports has been increasing. China is above 1, close to 2 in the 1980 to 1995 period. China's exports grew at a rate many times the global average growth during 2000-2002. Significantly, we can see a systematic decline in the RCAs of most East Asian countries (except Taiwan, which is heavily specialized in electronics,) beginning in 1995, with sharply negative numbers for all during 2000-2002, except of course for China. It is important to note, however, that revealed comparative advantage is an ex post measure, demonstrating but not explaining the underlying trends.

Table 6: Dynamic RCAs 1970-2002
(annual % change in country exports/annual % change in world exports)

	1970-1980	1980-1990	1990-1995	1995-2000	2000-2002
◆China	1.11	2.19	2.14	2.24	19.09
◆Hong Kong	1.11	2.57	1.84	0.65	-0.64
◆S. Korea	1.66	2.33	1.60	1.40	-4.03
◆Malaysia	1.01	1.73	2.27	1.23	-7.80
◆Philippines	0.93	0.62	1.89	3.58	-13.97
◆Thailand	1.20	2.25	2.19	0.88	-4.24
◆Singapore	1.34	1.78	1.98	0.67	-6.82
◆Indonesia	1.68	0.03	1.40	1.36	-5.59
◆Taiwan	1.42	2.39	0.94	1.23	-12.48
◆Japan	1.03	1.40	1.06	0.34	-9.81
◆US	0.89	0.99	0.97	1.26	-8.41

Computed from IMF, *International Financial Statistics*

The Exchange Rate

The nominal exchange rate is typically the rate relied on for evaluating trade transactions and is often the target for exchange rate pegging between different currencies, the RMB yuan to the dollar for example. But longer term decisions about importing and exporting, or about foreign sourcing of production, must be based on a real exchange rate that takes into account changes in domestic prices as well. Figure 2 shows real exchange rates adjusted for inflation differentials between East Asian countries and the United

States.[10] The graph shows the paths of real exchange rates from their initial levels normalized to 100 in l992.

The 1994 devaluation of the Chinese currency from 5.8 to 8.3 RMB yuan per US dollar is often seen as a critical factor responsible for the extraordinary growth of Chinese exports. Note how the decline of the Chinese exchange rate preceded the devaluations of other East Asian exchange rates in 1997-98. Some have argued that the Chinese devaluation reduced the competitiveness of other East Asian countries and precipitated the 1997 crisis. In fact the 1994 devaluation was principally an alignment of official rates to market rates at which most exports were already being priced. The mid 1990s, when Chinese exports grew so greatly, marks the time when factories in Shenzhen and Guangdong were being equipped to produce quality products for the world market. It is not possible to determine to what extent China's export record during this period represents the result of capital investments or management by foreign (often Hong Kong or Taiwanese) entrepreneurs or simply of assimilation of technology or learning-by-doing.

After the 1997 crisis other exchange rates in East Asia adjusted downward, and exchange rates throughout the region are now generally aligned with that of China as they were in 1992 before China's devaluation The exceptions are Hong Kong and Singapore, whose currencies have risen relative to 1992 parities, and Indonesia, which depreciated by a much greater extent than other regional currencies. For the region as a whole, the figures suggest that a decline in the exchange rate of some 40 to 50 percent. The result is striking in that for China and most other East Asian countries the real exchange rate in 2002 was about half its level of ten years earlier. In other words, Chinese and other East Asian exports have been supported by a substantial real depreciation of their currency exchange rates[11].

[10] For reasons of consistent coverage, deflation was done on the basis of the CPI. Alternative measures of prices, more appropriate in this case, gave approximately the same results. Comparison against the Japanese yen and the Euro would show even greater depreciation for the Chinese and East Asian currencies since the US dollar has depreciated relative to the yen and the Euro. These data show the same patterns as the nominal rates, though perhaps a little more strongly since the US inflation rate was higher on average than in most of the East Asian countries.

[11] Comparison against the Japanese yen and the Euro would show less depreciation until 2002 because the US dollar appreciated. But in the past year, the US dollar depreciation relative to the yen and the Euro means the RMB and other East Asian currencies have depreciated more against other world currencies..

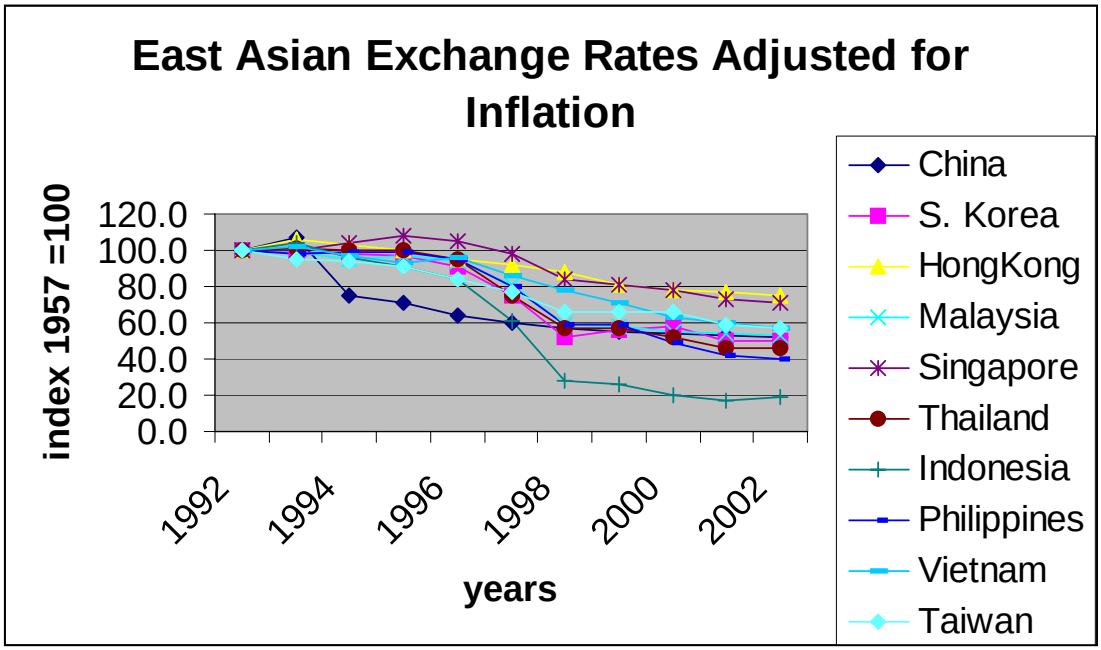
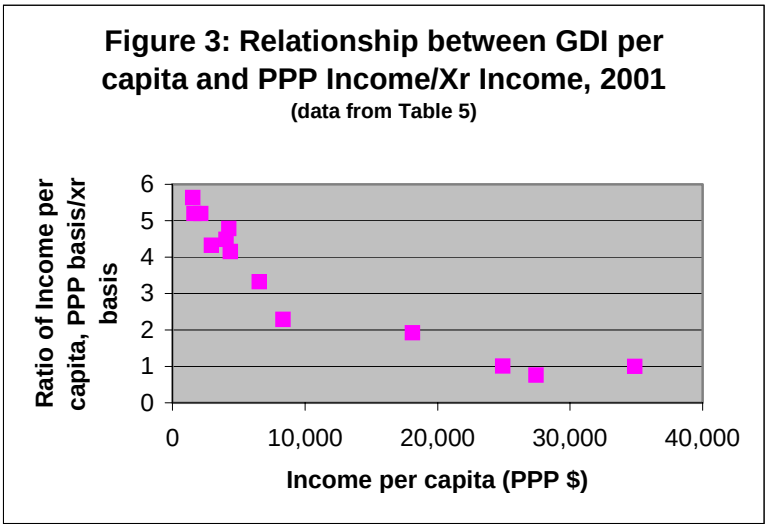


Figure 2

The discussion above deals with the changes in competitiveness over time. An important question is the level at a given point in time. In this sense, there is little disagreement that the RMB yuan is undervalued, the question is by how much. International comparisons of purchasing power have long indicated that for many developing countries per capita GDP on a purchasing power parity (PPP) basis yields much higher figures than the corresponding comparison based on nominal exchange rates (Summers and Heston, 1991). (Figure 3)



Though developing countries have very low incomes in comparison to the United States and other advanced countries when translated into dollars at market exchange rates, the disparity is not as large when adjusted for differences in local purchasing power. For China, the discrepancy between market and PPP-adjusted income is extreme—exchange rate-based GNI per capita is $890, compared with PPP-adjusted GNI per person of $4,260—a factor of 4.8 to 1. This represents an undervaluation of 79% (World Bank, 2001 figures). This implies an equilibrium rate of exchange of perhaps 2.7 renminbi per dollar rather than

Table 5: Income per Capita:
Exchange Rate and PPP Basis and Undervaluation

	$XRbasis	$PPPbasis	Undervaluation %
China	890	4,260	79%
S. Korea	9,400	18,110	48%
Malaysia	3,640	8,340	56%
Philippines	1,050	4,360	76%
Thailand	1,970	6,550	70%
Singapore	24,740	24,910	1%
Indonesia	680	2,940	77%
Vietnam	410	2,130	81%
Cambodia	270	1,520	82%
Laos	310	1,610	81%
Japan	35,990	27,430	-31%
US	34,870	34,870	0%

Source:World Bank data

8.3 RMB yuan per dollar, its recent pegged value. In other words, each RMB yuan is worth 58 cents rather than its pegged exchange rate of 12 cents. By this measure, China's undervaluation is considerably greater than in many other East Asian countries, although the poorest economies (Vietnam, Laos and Cambodia) and those at the heart of the 1997 Asian financial crisis show similar degrees of undervaluatuion.

Turning to the alternate unit value approach, sectoral unit value ratios (Table 6) compare the unit value of output in the total manufacturing and in major production sectors between China and the United States. The unit value ratios are simply the value per unit of sectoral real output in RMB yuan in China divided by the corresponding unit value per unit of real output in the US measured in US dollars.

Table 6 Unit Value Ratios by Manufacturing Branch China/US 1995[12]

	At Chinese weights	At US weights	Average	Undervaluation Relative Price Level (100 assuming 8.35y=US$)
Food and Kindred Products	5.8	5.8	5.8	69.9
Textile Mill Products	3.9	5.3	4.6	54.6
Wearing apparel	3.4	5.7	4.4	52.7
Leather Products and footwear	2.2	2.2	2.2	26.7
Wood products	2.3	3.7	2.9	34.5
Paper products, Printing & publ.	5.5	5.2	5.4	64.1
Chemicals and allied products	7.1	7.8	7.4	89.2
Petroleum and coal products	7.9	8.1	8	95.5
Rubber and plastic products	6.8	7	6.9	82.5
Non-metallic mineral products	2.4	1.7	2	23.9
Basic metal products	5.3	7.3	6.2	74.6
Fabricated metal products	2	6.4	3.6	43.3
Machinery and equipment	1.5	2.5	1.9	23.0
Transport equipment	1	1	1	11.8
Office, acct. computing machinery	2.5	6.6	4.1	48.5
Electrical machinery and equip.	3	3.3	3.2	37.8
Other manufacturing equipment	4.2	4.8	4.5	53.9
Total manufacturing	4.2	4.8	4.5	53.9

Source:Bai et al p.49

[12] It is unfortunate that the calculation is not more up to date. The authors indicate that they have not yet updated the information but relative values are not likely to be greatly changed.

That means, for example, that the unit value (approximately one could say price) of a unit of food and kindred products is 5.8 RMB yuan in China for every dollar in the United States. That figure can be compared to an exchange rate of 8.3 RMB yuan to the dollar to measure undervaluation, as in the last column of the table. As in the PPP comparison, substantial undervaluation of the yuan is apparent, though not as large in most industries as the PPP figures suggest. However, note that the results differ greatly by sector. The degree of undervaluation is greatest precisely in products that have heavy weights in Chinese export trade: leather goods, wood products, machinery and equipment. Textiles and wearing apparel show a unit value ratio indicating undervaluation near 50 percent. Not surprisingly, products where China is a net importer, petroleum and chemicals, for example, are almost fully valued according to the exchange rate.[13] Unfortunately, sectoral comparisons of unit value ratios with competing East Asian exporters are not available.

Labor Costs

As we suggested above, an advantage of the PPP exchange rate or unit value comparisons is that to provides a ready though approximate "multifactor" measure of currency under- or overvaluation. But since PPP or unit value comparisons are based on surveys of domestic prices, they are imperfect measures of costs of Chinese products actually delivered to world markets, where market prices in a world currency such as the U.S. dollar are relevant. While comparative information on production structures and input costs is not available, clearly wages represent a key cost ingredient. Chinese wages are extremely low by world standards and in comparison with most, but not all, East Asian countries.

Annual manufacturing earnings for China and several other developing Asian economies are shown in US dollars on an exchange rate basis in Figure 4. China's annual wages averaged in RMB 8750 in 2000, just over $US 1,000. Chinese wages in dollars have been increasing rapidly (15% per year in 2001 and 2002), and in some parts of China where exports originate—such as Shanghai, Fujian, and Guangdong provinces—they are higher than the national average, by a factor of 2. Still, overall manufacturing wages remain well below those in the Philippines and Thailand. Only post-crisis Indonesia and Vietnam have lower wages. Considering that United States manufacturing wages average over $25,000 on an annual

[13] According to the author, the statistic recorded for transport equipment is based on only one observation

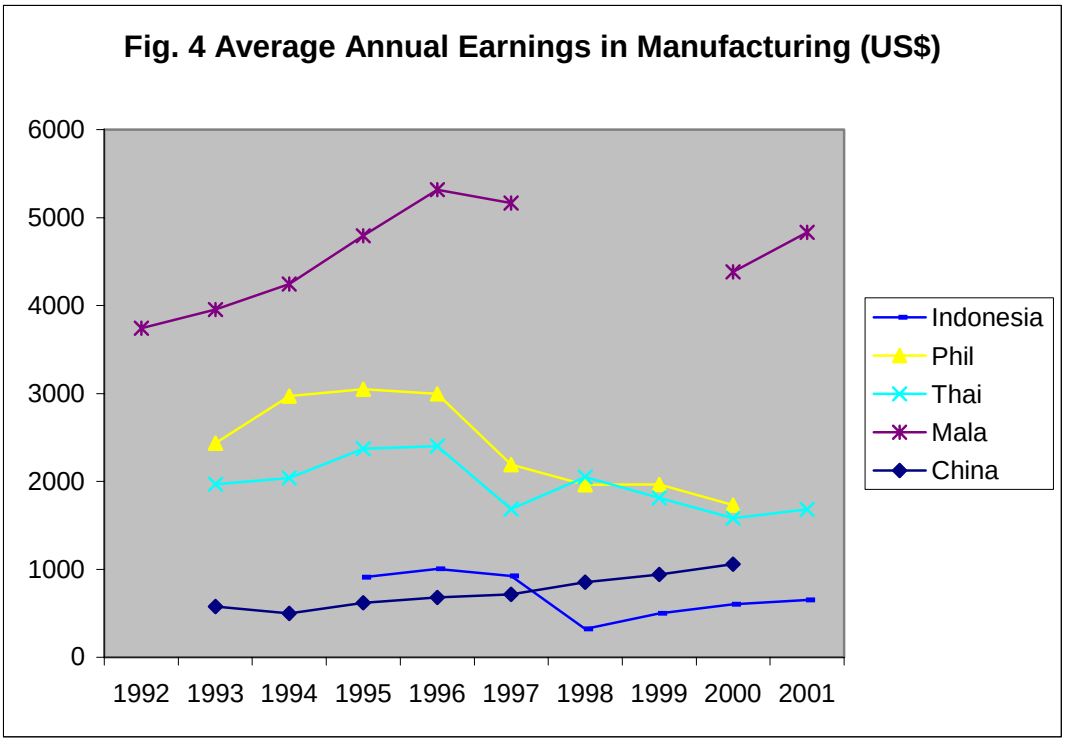
basis, it is not surprising that many products can be produced in China at much lower cost than in the United States.[14]

The wage differentials that favor production in East Asia, and specifically in China, have persisted for many years and, consequently, do not provide a single factor explanation for the recent upsurge of Chinese exports.. In recent years there has been rapid increase in wages, particularly of skilled workers and in the export-intensive provinces like Guangdong. However, China's enormous rural population and increasing numbers of "floating" urban workers suggest that it will be many years before the supply of low cost unskilled labor runs out.

Other cost considerations are more difficult to measure than wages. It is well known that transportation cost have been coming down for many years—air freight, for example—and trade barriers are set to be reduced with China's entry to the WTO.[15]

[14] Differences in productivity likely offset some, but not all, of these cost advantages. While aggregate labor productivity has been estimated at 3-7% of US levels, it is purportedly much higher in foreign-financed and joint venture enterprises that are important exporters. (See UNCTAD, 2002; Szirmai and Ruoen, 2000; Wu, 2001.) Sectoral level data is sketchy, but productivity also appears to be higher in key export industries, such as footwear, apparel and electrical machinery. Bai, Ren and Szirmai (2001) report 1995 estimates for these industries ranging from 6-13% of US levels.

[15] Hummels (1999) provides evidence that transportation costs overall have not declined in the post-war period, casting doubt on their role in explaining global trade growth. However, he does find sharp declines in air transport costs which helped to propel the strong growth in that sector.



Source: ILO and Chinese Statistical Yearbooks

Foreign Direct Investment as a Determinant of Competitiveness

A critical consideration for competitiveness is supplying products that meet world market specifications with respect to design, quality and technological content. This represented an important step in the growing competitiveness of Chinese industry. Prior to the 1990s, China was selling simple goods of relatively low quality. Since then, in part as a result of the intervention of foreign investors from Hong Kong and Taiwan and more recently from Europe, North America, and Japan, China has become a focus for foreign direct investment. China offers a special advantage over other East Asian countries in that many foreign producers view their entry as export producers in China only as first step, hoping ultimately also to sell in the huge and growing Chinese domestic market (Park and Lee, 2003). Others, like the automobile industry are producing for the domestic market, with the ultimate objective of also using China as an export platform.

Foreign firms begin by setting up subsidiaries or joint ventures in China to produce products for their home markets.[16] These have to meet world specifications and quality requirements. Increasingly, they are also raising the level of technology. As a result, Chinese goods have become highly competitive in Western markets and account for a growing market share. Frequently, the relationships within a geographic industrial cluster enable Chinese domestic firms to develop products comparable to those being sold in the world market, to apply internationally-used technologies, and to draw on experienced workers and suppliers. Learning to produce and economies of scale enable Chinese producers to improve their production efficiency.

Foreign direct investment has been a critical consideration in improving China's ability to produce goods for the world market. China has been the dominant recipient of foreign direct investment in East Asia receiving almost $50 billion of FDI annually (China and Hong Kong combined $74 billion in 2001), approximately 50 percent of FDI inflows into the East Asian region.. (Table 7)[17] an important factor not only for capital flows but also for flows of technology and management skills. The bulk of this FDI is going into export industries in the eastern seaboard of China, particularly Guangdong.

Table 7

Foreign Direct Investment in East Asia 1998-2001
(millions of US $)

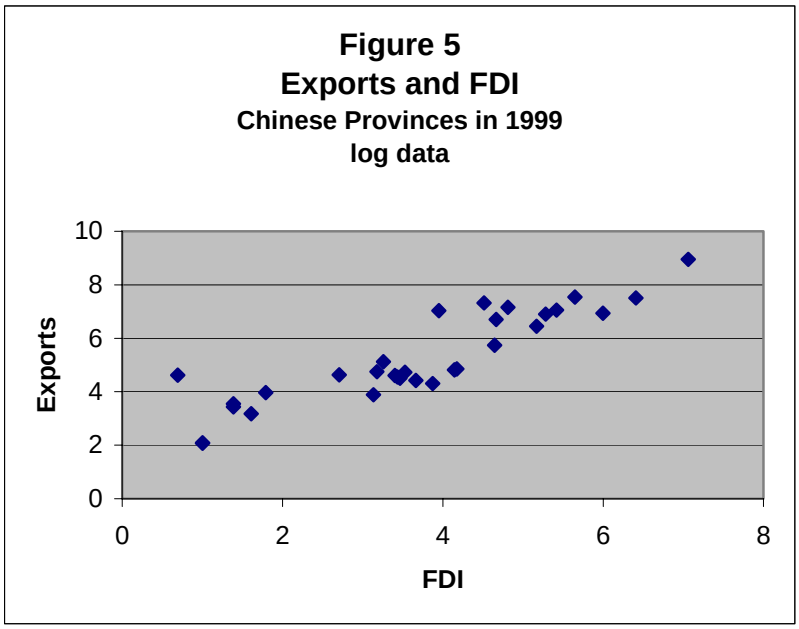
	1998	1999	2000	2001
China	43,751	38,753	38,399	52,344
Hong Kong	14,765	24,581	61,938	22,834
South Korea	5,412	9,333	9,283	8,893
Taiwan	222	2,926	4,928	4,109
Indonesia	-356	-2,745	-4,550	-1,446
Malaysia	2,163	3,895	3,788	3,549
Philippines	2,287	573	1,241	1,621
Singapore	6,389	11,803	5,407	8,609
Thailand	7,315	6,213	3,366	5,791
Viet Nam	1,671	1,412	1,298	2,191

Source: ADB

[16] For a contrary view of Chinese success in attracting FDI see Huang (2003), who argues that the surge in FDI reflects the barriers facing China's domestic private firms which make them uncompetitive compared with foreign multinationals.

[17] Next to the United States, China has become the world's largest FDI recipient.

It is possible to link statistically the relationship between direct foreign investment and China's export prowess. In Figure 5, data on FDI and exports by province of Chin (1999) show a remarkable relationship.[18] The role of Guangdong province is dominant with 30 percent of China's FDI imports and 40 percent of Chinese exports



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The geographic linkage between the level of foreign direct investment into the eastern provinces of China and these regions as a source of China's exports is unmistakable. Foreign investors not only provide capital. In most cases, they are responsible for technical and managerial skills and often they provide foreign markets as well. These firms integrate their Chinese operations into a value chain that extends into the world economy. (Ng and Yeats, 2003) Many of the foreign investment projects take the form of joint ventures with Chinese partners. The partner firms inform themselves of foreign technology and frequently take advantage of it to promote their own projects.[19]

[18] The estimated equation is Ln(ex) = 1.917 + .908 Ln(FDI) R^2 = .802. Similar results can be obtained from a cross country. (.08)
regression for East Asia.

[19] Correspondence with a Chinese business consultant. He points out that using world technology the Bird brand of telephone handsets has gained the number 1 position in China

Chinese products today meet world specifications and quality requirements. Increasingly, they are also raising their level of technology.

The changing nature of inward foreign direct investment points to China's evolving role as a high-tech producer. Table 7 shows the share of electronics-related FDI inflows of total FDI from three countries for which industrially-detailed data are available, US, Japan and Taiwan's approved FDI flows via Hong Kong. (Hong Kong itself is the single largest provider of FDI to mainland China, but detailed data are not available for these flows.) The data show a growing share of inward FDI in electronics and related components. For both Taiwan and the US, in particular, this share more than doubled in recent years.

Table 7 Electronics-Related Foreign Direct Investment Inflows to China (% of Total FDI)

	Taiwan's Hong Kong Indirect Mainland Investment	US Net FDI outflows to China	Japan Net FDI Outflows to China
YEAR	Electronics & electrical appliances % share	Electronics and electronic components % share	Electrical Equipment % share
1989-97	18.2*	31.1**	19.4*
1998	38.6	42.6	11.8
1999	42.9	33.2	9.7
2000	56.2	58.5	32.2
2001	45.1	82.9	35.3
2002	39.0		17.7

Notes: In Millions of US dollars. *1989-97 total, **1991-97 total.

Source: Computed: China inward FDI from UNCTAD

Hong Kong indirect mainland investment from HK report, "Statistics on Approved Indirect Mainland Investment by Year and Area"

US Net FDI outflows from US BEA.

Japan outward FDI from Ministry of Finance

As a result, Chinese goods have become more technically sophisticated and have increasingly been accepted in Western markets. Many of these products are made to specifications of developed country importers. Some goods are produced by subsidiaries of large multinational trade mark firms. Some Chinese firms have also begun to establish trade marks that are known and accepted in international markets (e.g. Haier, Konka, Huawei, and Legend).

It is not possible statistically to measure the qualitative improvements that have increased the competitiveness of Chinese products. But, changes in the range of products being produced are suggestive of the developments that are taking place.[20]

Other Factors Influencing Competitiveness

Some authors have put heavy emphasis on cultural factors as promoters of East Asian growth and competitiveness (Harrison and Huntington, 2000)..This type of explanation that might be termed the "Asian values, Asian success" paradigm lacks explicit linkages to the practices of Asian entrepreneurs. (Adams and Vernon, 2004). In the Chinese case, the cultural argument for relating Asian success to Asian values is complicated by the fact that China is a transitional economy in which national and provincial governments still maintain a substantial stake in industry. On the other hand, it may be argued that the turn toward the market economy has helped. Moreover, the entrepreneurs from Hong Kong, Taiwan, and elsewhere "overseas", who have motivated and directed many of the new Chinese export ventures, share language and culture with the Chinese Mainland.

Finally, there is a question of export promoting policies. The shift from a self-sufficiency to trade expansion was a central element of China's modernization policy in the late 1970s and early 1980s as has been the encouragement of FDI and private participation since then (Chow, 2002). There are numerous advantages and incentives for exporting firms, including foreign trade zones (now extended from the East Coast to all of China), retention of earned foreign exchange, special tax concessions, etc. Moreover, foreign firms are encouraged to establish joint ventures with Chinese firms in order to receive approval for producing for the Chinese market. These policies have undoubtedly encouraged FDI and have facilitated the development of export business. On the other hand, such policies are typical of the East Asian region as has been the opening of world trading potentials through reductions in tariffs and quantitative restrictions. These policy related developments are likely a factor but not a complete explanation for China's recent export competitiveness.

[20] Among recent articles that have documented China's export gains in capital-intensive and high tech export markets are Wong and Chan (2002), Chen (2001), and Voon and Yue (2003).

Evaluation

What do these informational elements suggest about the causes of China's competitiveness and export growth? The explanation clearly cannot be mono-causal. China's export competitiveness hinges on the coincidence of several factors: the favorable exchange rate, low wages and available supplies of unskilled labor, the reduced cost of communication and transportation, the flow of foreign direct investment and foreign management and its implications for China's productive abilities, the large scale of the potential Chinese domestic market, the opening of world markets, and the encouragement of Chinese foreign trade policy.

On the other hand, certain considerations have special importance. For example, Chinese export growth is more than a matter of low wages and an undervalued exchange rate. Appreciating the exchange rate, even by substantial amounts, is not likely to greatly diminish Chinese competitiveness. China's huge pool of cheap and increasingly mobile labor means that even with exchange rate readjustment, competitiveness based on low labor costs will be maintained for quite some time. Chinese competition may also further displace some low-cost export production in other parts of the world, East Asia or Mexico, for example, although in East Asia most regional exchange rates have adjusted back in line with that of China prevailing in the early 1990s.

Secondly, Chinese producers have become greatly more proficient at meeting world requirements for quality and product design. The large inflow of foreign direct investment and entrepreneurship, which is responsible for much of the export flow, has facilitated this process, and , in turn, reflects the favorable economics of export production in China. The shift of Chinese production toward more advanced products with technological content is also notable. On one hand, this represents competition with other East Asian countries. On the other, it reflects a collaborative symbiotic relationship with South Korea, Singapore, and Taiwan whose cost structure has outgrown the simpler high technology goods that supported earlier phases of their industrialization.

China's competitive ace in the hole continues to be its large and potentially mammoth domestic market. Foreign firms seek entry to China not only to take advantage of low cost export platforms, but also as a way to position themselves for future local sales. Aside perhaps for India, there is simply no other developing economy with such promise as a market.

What are the implications for the U.S. and China's competitors of China's growing international market prowess?

An artificially undervalued RMB yuan would be a serious matter. since the resulting adjustments in production and trade would not be consistent with long-term comparative advantage. Moreover, artificial undervaluation is likely not in China's best interests, since it increases the cost of imported goods in China and lessens competitive pressures from abroad that help to raise Chinese productivity..

On the other hand, Even if the RMB yuan were significantly appreciated, patterns of trade will continue change in favor of China. .For the U.S., specialization away from labor-intensive or low-technology products is inevitable and in the nation's overall interest. Structural adjustment among and within industries is painful and the impact on employment and wages represents an issue politically. For other East Asian countries, appreciation of China's RMB yuan would help competitively, but these countries too make their biggest gains up the development ladder by upgrading their production into more advanced products.

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