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Working Paper Series Vol. 2004-13
July 2004

The International Centre for the Study of East Asian Development, Kitakyushu

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Abstract

This paper discusses the basic trends in employment, output, and labor productivity during China's period of heavy industrial restructuring between 1995 and 2002. The analysis is based on a set of approximately 51,000 of China's largest industrial enterprises covering the mining, manufacturing and utility sectors. China's market reforms have been ongoing for a period of twenty-five years. As part of this process, China has undergone massive restructuring of its industrial enterprises and granted market access to foreign and private domestic firms. This has led to enormous gains in productivity and has made China a top exporter of goods to the developed world. With the formal sanctioning of private enterprise in 1999, WTO entry in 2001, and a constitutional guarantee of private property in 2004, China has reached a new level of openness and integration into the world economy. Concurrent with China's emergence in the global economy, the developed nations have seen a sharp reduction in manufacturing employment. In developed countries at the technological frontier, the loss of jobs in manufacturing generally can be traced to improvements in production technologies that make it possible to generate more output with fewer resources. Reinforcing this trend, lower communications and transportation costs coupled with more open markets in countries like China have made it easier to outsource portions of their value chains. While there has been much discussion about offshoring high-wage jobs from the U.S. to low-wage countries like China, the loss of large numbers of manufacturing jobs is occurring in the U.S. and China simultaneously. Moreover, China is losing jobs in many of the same industries where the developed world has seen the greatest employment declines. Globally, workers are shifting into the service sector – and the new jobs are often higher value added, and higher paying than the manufacturing jobs they replace.

[1] This report was made possible by a grant from the International Centre for the Study of East Asian Development (ICSEAD). We thank them for their patience as the project was delayed substantially because of the SARS epidemic. We also received generous support from Washington SyCip, Vice Chairman and Trustee of The Conference Board, and member of the Global Advisory Council. We thank the Global Advisory Council for their helpful advice and comments. We are very grateful to Toni-Marie Spera and Olivia Wun for providing excellent research assistance.

1. Introduction

China's market-oriented reforms have been ongoing for a period of roughly twenty-five years. These reforms began in the agricultural sector in the late 1970s -- Mao's communes were dismantled and replaced by a 'responsibility system' that gave farmers greater control and accountability over their crop production. In manufacturing, market-based incentive systems were first introduced in small factories controlled by townships and villages. These reforms allowed managers of collectives and very small firms (*geithu*) some control over their profits, and the allowance of discretionary bonuses for productive workers. They also imposed fiscal restraints on many governmental enterprises by limiting their ability to borrow funds from the state.[2]

During the 1980s and early 1990s the government gradually expanded incentive-based policies to some larger industrial enterprises, but stopped well short of sanctioning private ownership. Special export-focused industrial zones, which made extensive use of foreign capital and private ownership structures, were also established to support export markets. These reforms were all very successful and produced rapid economic growth – 7.8 percent annual average between 1990 and 2002.[3]

Despite this progress, China still has been plagued by widespread poor performance of its large industrial state-owned enterprises (SOEs). As late as 1995, roughly half of the SOEs were unprofitable and required large state-subsidies for continuing operations. A key factor was that productivity levels were very low, a mere 10 percent of the foreign-owned enterprises operating in the special economic zones.

This poor performance was not from lack of attention – the state made numerous attempts to introduce incentive-based systems, such as performance contracts, throughout the 1980s and early 1990s, but these were largely unsuccessful at improving productivity.[4] The lack of true private ownership structures and the presence of significant numbers of under-utilized employees were major impediments to profitable operations. Besides forbidding private property, China's socialist system guaranteed lifetime tenure for urban industrial workers, making it almost impossible for firms to reduce their labor forces.

The employment situation made reform of the SOEs especially difficult. In 1995 government-held enterprises employed approximately 90 percent of industrial workers, one-third of which worked at large SOEs. With these enterprises employing such a substantial percentage of the workforce, widespread layoffs and massive unemployment were inevitable, at least in the short-run, as the reforms proceeded. Finding new opportunities for employment remains a big challenge for China.

In the mid-1990s the government began to address more aggressively the poor SOE performance in many of China's medium and large state-owned industrial enterprises. The Company Law of 1994 laid the foundations for modern corporate structure, and in that year the government began to facilitate the transition of many SOEs to shareholding enterprises (although the state remained the largest shareholder in most cases). In 1997 the Fifteenth Party Congress rapidly accelerated the pace of the reform, allowing thousands of SOEs to

[2] See Dougherty and McGuckin (2002).
[3] The Conference Board/Groningen Growth and Development Centre Total Economy Database.
[4] See Shirley and Xu (2000) for further details on the successes and failures of performance contracts in China.

go bankrupt. A 1999 constitutional amendment explicitly granted state protection to private enterprises; this was the first time such status had ever been recognized. The most dramatic symbol of China's commitment to openness was its 2001 entry to the World Trade Organization (WTO). In early 2004 the government formally guaranteed the protection of private property in the constitution.

As expected, the transition has been plagued with problems as both unemployment and corruption have accompanied the process. Estimates of China's unemployment vary widely, but the basic fact of China's large population means that the number of persons out of work is very high. The combination of several state sources of information led to one recent estimate of China's national unemployment at 23 percent.[5] This corresponds to 168.5 million workers in 1999 – a number greater than the total number of *employed* persons in the United States. While this is only a rough estimate, it is clear that there are a vast number of underemployed workers.

Along with unemployment, corruption has been a substantial problem during the transition. Opportunities for theft are ever present as assets with weakly defined ownership rights are privatized. The State Foreign Currency Administration estimated that corrupt officials illegally removed 53 billion in U.S. dollars from the country between 1997 and 1999.

In spite of these problems, the government continues to push the reform accelerator. And in early 2004 the Communist Party Congress formally sanctioned the protection of private property in the constitution.

2. Reform Process Generating Enormous Job Loss in China

Between 1995 and 2002 China lost 15 million manufacturing jobs – 15 percent of its total manufacturing employment.[6] Our data for large and medium sized firms, which cover a large share of output and employment in the industrial sector, show that the loss was widespread, with 26 of the 38 major Chinese industries showing negative job growth between 1995 and 2002. Some of the hardest hit industries were textiles (1.8 million jobs lost), steel (557,000 jobs lost), machinery (588,000 jobs lost), and non-metal products (429,000 jobs lost). These job losses can be traced to restructuring and rapidly advancing domestic productivity – the driving factors behind China's growing international competitiveness.

2a. Some Highlights about the Sample

The sample used in this study tracks approximately 51,000 of China's largest industrial enterprises over the period between 1995 and 2002. These enterprises constitute about 13 percent of industrial firms – those for which the Chinese government keeps the most accurate, detailed and timely statistics. This sample is not designed to be statistically representative, but it accounts for large shares of both output (55 percent) and employment

[5] See Wolf, Zycher, Eberstadt, and Lee (2003, p. 13).
[6] See National Bureau of Statistics of China (2003).

(31 percent). In most cases the sample gives a good picture of the broader Chinese industrial sector. For example, the overall industrial sector shows a 15 percent net job loss between 1995 and 2002, which is virtually identical to that found in our large and medium firm sample. This suggests a similar pace of restructuring. The broader sector sees similar, but slightly slower output growth (12 percent annually vs. 14 percent in the large and medium). Additionally, the share of total government-run enterprises in the broad sector is similar to the share observed in our sample.

The database is at the individual firm level, assembled from the 1995 Chinese Industrial Census and annual surveys for 1996-2002 under procedures that ensure the confidentiality of individual respondents. It represents the most detailed, accurate, and current data available on China's industrial sector and includes information on the ownership structure of each firm.

The sample differs from the rest of the industrial sector in some important ways. First, the small firms have 25 percent fewer employees than the average large and medium sized firm, so they are very small firms. Second the large and medium firms are 2.7 times as productive on average. The sector-wide employment share of smaller firms is much larger than their output share. Third, medium and large firms traditionally received preferential treatment from banks. This supported their growth and, in some cases, placed the larger firms among the group of firms in greatest need of restructuring. Finally, although the government presence is similar in each, the medium and large firms tend to be dominated by SOEs, while smaller firms are more frequently classified as collectives.

There is a significant advantage to using the large and medium firm sample – data quality is much greater than for the small firms. China's statistical agencies, as is the case in most countries, including the U.S., focus on the larger firms because they are important to the sector totals. It is also difficult and expensive to obtain data for the thousands and thousands of smaller firms.

2b. Structural Reform of SOEs Main Cause of Job Loss

The bulk of China's manufacturing job losses can be traced to the restructuring of state-owned enterprises (SOEs). Between 1995 and 2002, state-owned and operated firms lost 12.1 million jobs. In 1995 the state employed 81 percent of workers in our sample, but this dropped to just 49 percent by 2002.

As part of this rapid restructuring, the government furloughed millions of factory workers (referred to as *xiagang)*. The furloughed workers are mostly older employees with low skill levels, who upon losing their lifetime tenure jobs have limited prospects for re-employment.

It is difficult to accurately estimate the number of these workers. Unless their company has gone bankrupt and the position is eliminated altogether, many remain affiliated with their plant (and thus stay officially employed). Additionally, many are counted as having retired early, and are thus not included in unemployment figures.[7] It is not likely that this trend will subside any time soon. Indeed, a recent IMF working paper estimates that there

[7] For a detailed description of the difficulties in counting *xiagang*, see Solinger (2001, pp. 671-88).

are still around 10-11 million surplus workers in the SOEs.[8] Private firms are picking up some of the employment slack, but not nearly fast enough to absorb the flood of furloughed SOE workers.

Foreign-funded firms in our sample did show rapid employment growth, but since they started from a small base in 1995, the absolute number of workers added was relatively low – about 2 million between 1995 and 2002. Another small but fast growing ownership type was domestic private commercial enterprises (non-shareholding), which are largely owned and operated by Chinese entrepreneurs. They added 700,000 jobs, at an incredible annualized rate of 144 percent due to their very small size in 1995. In spite of these gains, the net job loss for the industrial sector was 4.5 million between 1995 and 2002. Private firms simply did not add as many jobs as the state-owned enterprises lost.

Joint-stock companies showed a net gain of 5.9 million workers over the period 1995-2002. Many joint-stock companies are actually reorganized SOEs, converted to a shareholding structure where the state remains the sole or majority owner.[9] Thus this source of employment growth probably reflects more of a classification change than real economic expansion. Supporting this argument, the productivity level of these operations was only slightly higher than for state-owned firms. It takes time for firms to undertake the reorganization and restructuring required to integrate new ownership and operating procedures. Many of the converted enterprises we are now observing have only logged a few years of operation. Consequently, it is too early to draw any firm conclusions about their ultimate competitiveness. Figure-1 provides a graphical portrayal of the Chinese manufacturing job loss pattern.

3. Comparing Chinese Industries Lose Jobs with that in the Developed World

The loss of manufacturing jobs in the developed world has received substantial attention from business, the media, and policy-makers. In the United States, the recent recession and ongoing 'jobless recovery' hit manufacturing employment very hard. Since the year 2000, 2.8 million jobs manufacturing jobs have been lost in the United States. The European Union has also seen heavy manufacturing job losses, a decline of 14 percent in employment since 1990, with particularly large losses in the United Kingdom and Germany.[10] Japan has followed the same course with a 19 percent reduction since 1990**.**

The relative magnitudes of job loss in manufacturing in the developed world and China are similar, with both experiencing 15 percent declines between 1995 and 2002. With the caveat that Chinese industry groupings are not directly comparable to those in the developed world, it is possible to make some broad observations about which jobs were lost.[11]

Among China's seven largest industries (by employment), there is a very strong correspondence of job loss in the developed world and job loss in China between 1995 and

[8] Brooks and Tao (2003).
[9] See Dougherty and McGuckin (2002) for detailed analysis of the conversion process.
[10] Groningen Growth and Development Centre, 60-Industry Database, available at http://www.ggdc.net.
[11] See Appendix B, available at The Conference Board's website for technical details on the comparison. (http://www.conference-board.org/publications/describe.cfm?id=809)

2002, with the one exception of electronics and telecommunications.[12] For example, textiles was one of the worst hit industries in the U.S., with 415,000 jobs lost, but the losses in China were much greater, at 1.8 million jobs (See Figure-2).

The pattern is replicated across the manufacturing sector in industries where China has a strong presence, with China losing more jobs than the United States in most cases. In both countries output continued to rise in these industries while employment fell. This is an indication that productivity and automation were at the core of these changes.

Four manufacturing industries, however, show a different pattern – jobs leaving the U.S. and growing in China. These industries – apparel, electronics/ telecommunications, leathers and furs, and plastics – are at the heart of the offshoring trend, as they are very labor intensive and their skill requirements are not high. The trend is very strong in apparel and electronics/telecommunications, with over 600,000 U.S. jobs lost. Technology has been a factor in both these industries, but they have been difficult to fully automate because of wide variation in materials and components and the variations in the proportions used in final products. Consequently, firms have been eager to cut labor costs through outsourcing. However, the jobs being cut are among the lowest paid in manufacturing. The average wage for apparel workers operating sewing machines was under $9 dollars per hour in the United States in 2002. For electronic equipment assemblers it was around $12.50 per hour.[13] Indeed, many of the service jobs replacing these are at higher wages.[14]

A recent BLS employment projection forecasted professional/business services and educational/health services would account for 46 percent of U.S. employment growth between now and 2012.[15] These occupational groups had 2003 wages of $17.20 per hour and $15.64 per hour respectively – much higher rates of pay than those for the manufacturing jobs that are being lost.

4. Sources of China's Recent Productivity Growth

In spite of all the job losses, industrial output continues to rise. There was a 14 percent annualized output growth between 1995 and 2002 for the Chinese industrial sector, even as employment fell by 2 percent per year. For output to increase while jobs decrease, productivity must increase – and that is exactly what happened, with 17 percent annualized growth in productivity over the period. All ownership types saw productivity advances. In fact, state and foreign sectors experienced comparable rates of productivity growth.

But the pattern of output growth differed widely across ownership types. The foreign group saw output growth of 28 percent annualized. In contrast, output growth was only 3 percent in the state-owned and collective firms. The difference is explained by the extensive job loss that accompanied the restructuring of the state owned enterprises. In fact,

[12] Note that Apparel follows the pattern of Electronics and Telecommunications, but is not one of the largest employing industries.
[13] These wage data come from the Bureau of Labor Statistics National Compensation Survey.
[14] This fact does not mean it is necessarily possible for the displaced workers to compete for these new jobs. Indeed many will not have the correct skills and it is not appropriate to minimize their problems.
[15] Bureau of Labor Statistics (2004, p. 8).

unlike the state-owned enterprises, foreign-funded firms added significant numbers of jobs. Figure-3 provides a tabular presentation of growth of firms under different ownerships.

4a. Productivity Growth and Job Loss in State-Owned Enterprises

State-owned enterprises lost jobs at an annualized rate of 9 percent, but managed to increase output by 3 percent per year. The numbers for collective operations, which are also operated by the state, were very similar. This represents productivity growth of around 13 percent among firms operated by the government. With these gains came the loss of 13 million jobs in the government-owned sector. Nonetheless, these productivity increases are a strong indication that the restructuring is improving the competitiveness of Chinese industrial enterprises. Figure-4 provides a graphical presentation of the recent output, employment, and productivity dynamics in the Chinese state owned enterprises.

Prior to the restructuring, many SOE employees were not directly involved in the production of goods, but instead focused on social services for employees – such as medical care and education. As the market reforms proceeded, these employees were downsized, reducing industrial sector employment. It is likely that these furloughed workers are beginning to shift into the social service sector. This should allow economic specialization and more efficient production of these services, leading to increased productivity in this area of the economy also.

While analysis of the service sector is well beyond the scope of this report, it is clear that it is growing at a rapid clip in China. The share of services in GDP was 33.5 percent in 2002, up from 30.6 percent in 1995. Employment has grown even faster, from 24.8 percent to 28.6 percent over the period, a gain of over 4 million employees.[16] This transition is part of the shift towards a developed economy. In the U.S. for example, the ratio of manufacturing to services employment is roughly 1 to 1. In China it is currently 1.75 to 1, but was over 3 to 1 as recently as 1990. These kinds of shifts better match the workforce with domestic and global demand, and are an important part of the development process.

4b. Productivity Growth and Jobs Gain in Foreign Owned Enterprises

A second major driver of Chinese productivity gains has been the rapid growth of foreign-invested firms.[17] These ventures represent foreign direct investment (FDI) – long-

[16] These calculations are from *China Statistical Yearbook* (2003). For the services sector we use the numbers for tertiary industry.

[17] It may be noted that there are two ways that foreign firms can start enterprises in China – wholly owned foreign enterprises (WFOE) or joint ventures (JV). Wholly owned foreign enterprises are 100 percent owned and controlled by foreign investors and are almost always located in Special Economic Zones (SEZ) in three coastal provinces – Guangdong, Fujian, and Hainan. Locating in an SEZ is easier than starting a joint-venture, because WFOEs do not require forming a partnership with a local Chinese firm. However, WFOEs face a major hurdle – substantial access restrictions to the domestic market, and therefore they must rely on exports to markets outside China. WFOEs are less common than joint ventures. In 2002 there were 4,402 medium and large joint ventures, but just 1,937 wholly owned foreign enterprises. Unlike WFOEs, joint ventures are formed when a foreign firm partners with a local company. Besides access to the large domestic market,

term investments in the Chinese economy that are directly managed by the foreign entity. The close management of these operations by foreigners provides for the transfer of modern technical and managerial techniques. It is therefore, no surprise that they show higher productivity levels. In fact, joint ventures of foreign companies with Chinese firms are 7 times as productive as state-owned operations and over 4 times as productive as domestically run private enterprises. These gaps have narrowed only slightly over time.

The key difference between the foreign-funded productivity growth, and that of the state, is that foreign enterprises grew productivity *while also increasing jobs*. The SOE productivity growth is dominated by the furloughing of *xiagang.* Foreign-invested firms are expanding their shares of economic output as their productivity advances, presumably importing capital that embodies new technologies, as well as managerial know-how.

Driven by an 8 percent annualized *increase* in employment and a 17 percent annualized increase in productivity, foreign joint ventures (non-Hong Kong/Taiwan/Macau) experienced, a total of 27 percent annualized increase in output. This almost doubled the foreign-invested share of industrial gross output between 1995 and 2002, as it grew from 14 percent to 35 percent. In contrast, state-owned firms saw a 9 percent annualized decrease in employment coupled with 12 percent productivity growth, for a total of just 3 percent annualized output growth. Figure-5 provides a graphical presentation of the recent output, employment, and productivity dynamics in the foreign funded enterprises in China.

One relationship has held consistent in China since the economic reforms began in 1978 – foreign owned firms are more productive. While there has been some convergence, the foreign advantage remains. In 1995 the average firm with foreign-investment was 4.5 times as productive as an SOE in our sample. By 2002 this number had fallen slightly to 4.3, indicating that the SOEs were closing the gap on foreign firms extremely slowly. See Figure-6 for a graphical presentation of the comparison.

4c. Productivity Growth in Private Chinese Firms

Private domestic forms of ownership outperformed SOEs, but fell far short of foreign-funded companies in terms of performance. In 2002 shareholding enterprises were 47 percent more productive and private commercial firms 56 percent more productive than state-owned enterprises. These gaps have remained relatively constant since 1995. Some of this derives from difference in the size of enterprises. In addition, the composition of output differs between the two groups. Moreover, many of the private domestic firms, especially the joint stock, are reorganized state-owned enterprises, and thus have undergone significant restructuring themselves between 1995 and 2002. As noted earlier, it takes time to accomplish the necessary reorganizations to be successful as a private firm.

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foreign firms can gain advantage from the local know-how of their Chinese partners. This can be critical in setting up a Chinese venture – the local partner will be more experienced in navigating government regulations and setting up supplier and labor relationships. The National Bureau of Statistics of China reports on joint ventures in two separate categories: Hong Kong, Taiwan, or Macau ventures and other foreign enterprises (generally from the U.S., Japan, and Europe). Of the 4,402 large and medium JVs in 2002, 2,465 were Hong Kong/Taiwan/Macau invested and 1,937 had investors from other nations.

4d. Productivity of Joint Ventures

While foreign-funded firms outperform SOEs on average, all foreign firms do not perform the same. In 2002 joint ventures with U.S., European, and Japanese firms were the most productive of any ownership type in China – 932,000 yuan RMB per employee year (almost 7 times the productivity of the state-owned firms). This group also saw the fastest productivity growth. This was however not always the case. In 1995 wholly owned foreign enterprises maintained a 42 percent productivity advantage over joint ventures with western companies. By 2002, the relationship had completely reversed, with non-Hong Kong/Macau/Taiwan joint ventures being 72 percent *ahead* of the purely foreign owned. Wholly owned foreign enterprises saw the slowest productivity growth among foreign firms – just 3 percent annualized. However, these firms started from a substantially higher productivity base 443,000 yuan RMB per employee in 1995 (as compared to 261,000 yuan RMB per employee in joint-ventures).

The performance advantage of joint ventures over wholly-owned foreign enterprises partially reflects the growing significance of the domestic market. Traditionally it has been easier for companies to set up WFOEs, as this eliminated the need for complex negotiations with local partners. However, WFOEs face more restrictions than joint ventures – they are prohibited from all but manufacturing industries and must export most of their output. Consequently, many companies in sectors like transportation and telecommunications have opted to use the joint-venture format. Many of these have been very successful, such as Shanghai Volkswagen, the largest joint venture in China and the leader in domestic automobile sales.

Industry composition may also play a role in the productivity differences between foreign-funded enterprises, but it is not likely to be the dominant effect, as the distributions across foreign ownership types are actually quite similar. Forty-two percent of the 2002 gross output (824 billion yuan RMB) for foreign invested firms was concentrated in a single industry – electronic and telecommunication equipment. Other well-represented sectors are transport equipment, chemical manufacturing, and machinery. However, the compositions do not vary greatly between foreign-funded ownership types. Hong Kong/Taiwan/Macau firms are most concentrated in electronics and telecommunications – 54 percent of their gross output in 2002. Many electronics factories have been moved directly from Hong Kong across the Chinese border into the Shenzhen economic zone, where labor costs are 90 percent lower.[18] Wholly owned foreign enterprises have the strongest presence in transport equipment – 21 percent of their 2002 gross output.

5. Recent Structural Changes in the Chinese Textile and Apparel Industry

[Figure-7: China Loses Textile Jobs Much Faster Than the United States]

[Figure-8: Textile Labor Productivity Grows Six Times Faster Than U.S]

The Chinese textile and apparel industries have received substantial attention, both as drivers of China's economic growth and as outsourcing loci for U.S. and European jobs. It

[18] A subway line is currently being constructed that will more closely link Shenzhen with Hong Kong.

is very clear that the industries are undergoing significant structural change in the developed world. There has been long-term job decline in U.S. textile and apparel employment from 2.4 million jobs in the peak year of 1973 to just under 1 million in 2002.[19] The pace since 2000 has been twice that of other U.S. manufacturing industries. The losses have been particularly severe since 2000 – 200,000 jobs lost and many plants shut down entirely. Outsourcing has frequently been implicated as the main driver of these declines, and in November of 2003 the U.S. reacted by applying a quota on three categories of Chinese textile and garment – bras, robes, and knitted fabrics. (The WTO requires the removal of all quotas on Chinese textiles by 2005.)

There is no question that outsourcing has contributed to the loss of U.S. textile and apparel jobs, but closer inspection reveals that the two industries are actually very different. Textile manufacturing involves the conversion of raw fibers into thread, yarn and fabrics, whereas apparel companies take these products and produce clothing. In recent years textile processing has become a highly automated, relying on computers and sophisticated machinery. Apparel, on the other hand, continues to be labor-intensive, with sewing machine operators holding most of the jobs.

These differences are reflected in the employment trends. In the textile industry both the U.S. and China lost a substantial number of jobs between 1995 and 2002. (See Figure-7) But in apparel, the trend is dissimilar – the U.S. lost jobs while China gained them. In the case of apparel opportunities for automation are more limited than in textiles and companies have reduced labor costs by moving jobs to China. This was one of the few Chinese industries to see any employment growth, and is indicative of outsourcing by the developed world. These lost jobs are predominantly low-wage at just under nine dollars an hour for a sewing machine operator. Nonetheless, even here the trend in jobs is down as the gains in China are little more than a third of the U.S. job losses (160,000 versus 454,000).

Although some textile jobs have indeed moved to China, the data do not suggest that outsourcing is the dominant effect. Both the U.S. and China are losing jobs to rapid gains from productivity and automation.

5a. Grand Scale Restructuring of the Chinese Textile Industry

As the government moved forward with reforms of the state-owned and collective enterprises, textile firms experienced a hemorrhage of jobs – 1.8 million between 1995 and 2002 (44 percent of total). This is 9 times the number of jobs lost in the U.S. textile industry. Moreover, unlike in other sectors of China's economy, foreign-funded firms are not adding large numbers of jobs in this area. In fact, foreign-funded firms added merely 81,000 jobs to the Chinese textile industry between 1995 and 2002. Joint ventures with Western firms actually decreased employment by 2,000 jobs.

While exports should increase once the WTO quotas are dropped, it is unclear whether these changes will reverse the employment trend in China. Demand growth is not rapid. While output continues to rise at 4 percent year, this figure is modest compared to the industrial sector's overall 14 percent growth. And labor requirements also grow slowly

[19] These data are aggregated numbers from the Bureau of Labor Statistics SIC series.

because labor productivity is rapidly increasing at 13 percent annually, significantly outpacing the 2.4 percent growth in U.S. textile productivity. (See Figure-8) Moreover, in the high-productivity joint ventures with foreign firms, the rate is an incredible 18.4 percent annually.

6. Conclusions

The trends in textiles and apparel in the Chinese industry are part of a larger pattern of global structural change. As discussed in some length in McGuckin (2004), these shifts are parts of a larger reallocation process driving manufacturing job declines in both the developed and developing world. For most of China's large manufacturing industries (and particularly in textiles), the dual pattern of job loss and productivity gain in the U.S. and China suggests a fundamental structural shift. U.S. firms are indeed moving jobs to China to benefit from lower labor costs, but Chinese employment is falling even faster than that of the U.S. Both countries are seeing restructuring of their manufacturing sector through technology, automation, and productivity. Moreover, the employment situation in both places is difficult, with large numbers of workers displaced. In a few industries, such as apparel, indications are that China is gaining some jobs at the expense of the United States. However, the jobs transferred are among the lowest paying in the U.S. and only account for a fraction of the job gains in China. The productivity effects are much more dominant on both sides of the Pacific. The key challenge to both economies will be finding ways to re-employ these workers as the structural changes continue to alter their old industries.

But the challenges for China are much greater than for the developed economies. For example, unlike in China, U.S. unemployment rates are relatively low by historical standards, as the U.S. has been very successful in creating jobs in services. While, China's service sector has been growing, the gains have not yet been sufficient to offset the massive downsizing in manufacturing. Moreover, China has yet to seriously attack modernization and reform in the agricultural sector, which still employs 50 percent of the population. This will require a long period of sustained restructuring as workers move from farms to other industries.

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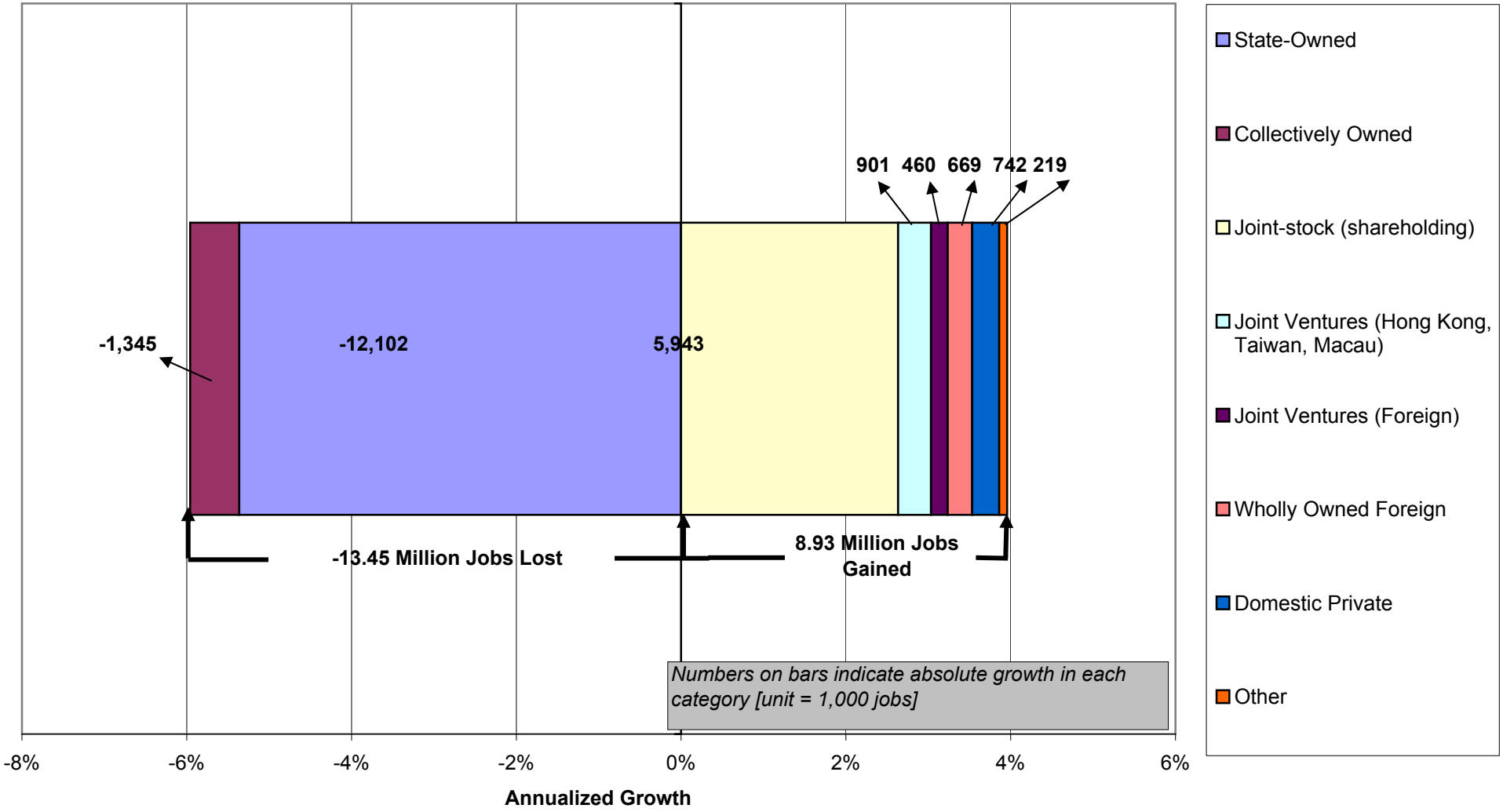
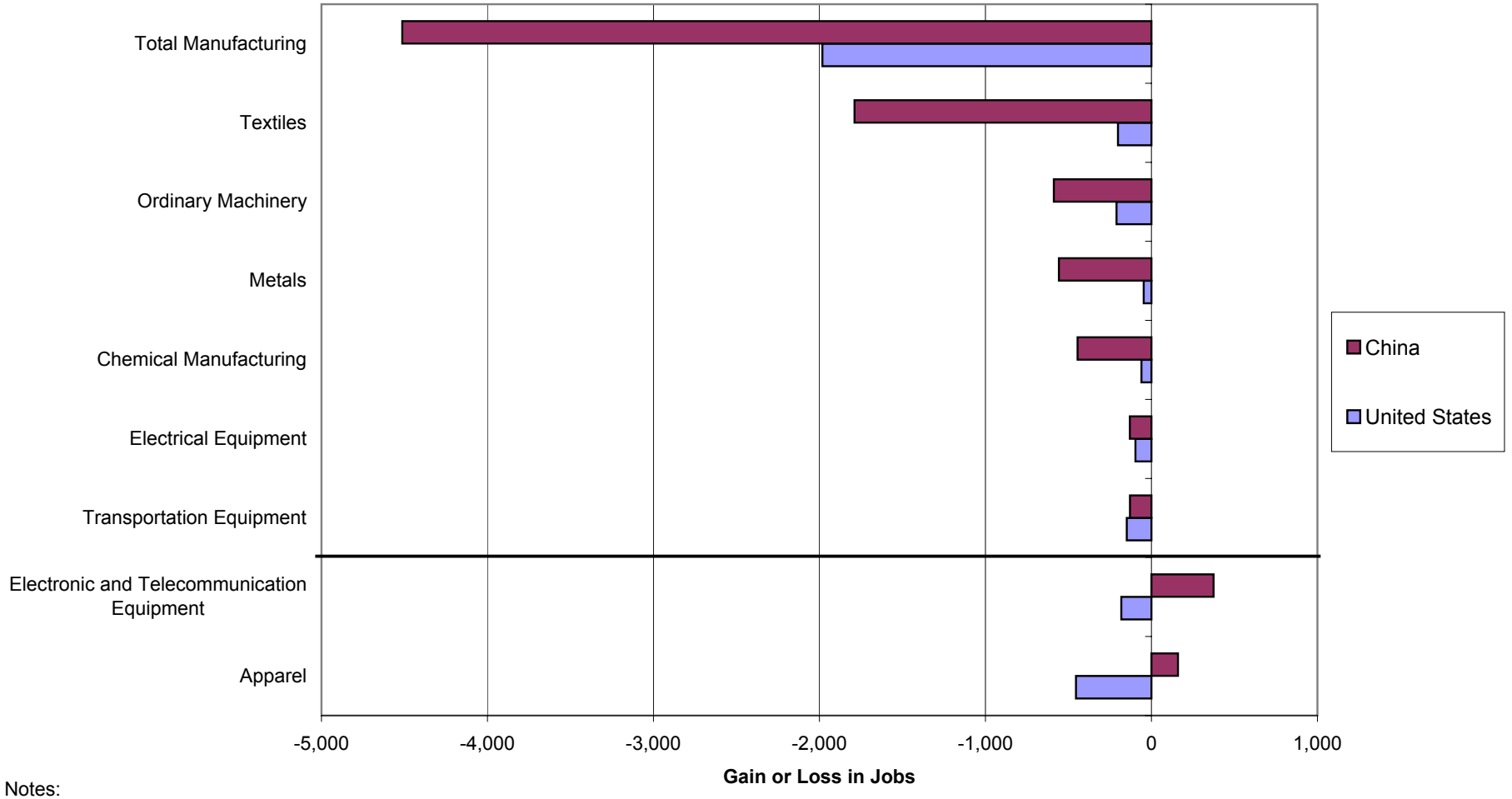
Figure-1:SOE Restructuring Drives China's Manufacturing Job Loss (1995-2002)



Source: National Bureau of Statistics of China and TCB analysis

Figure-2: Pattern of Manufacturing Jobs Loss Similar in China and U.S., But Not in Electronics and Apparel (1995-2002)

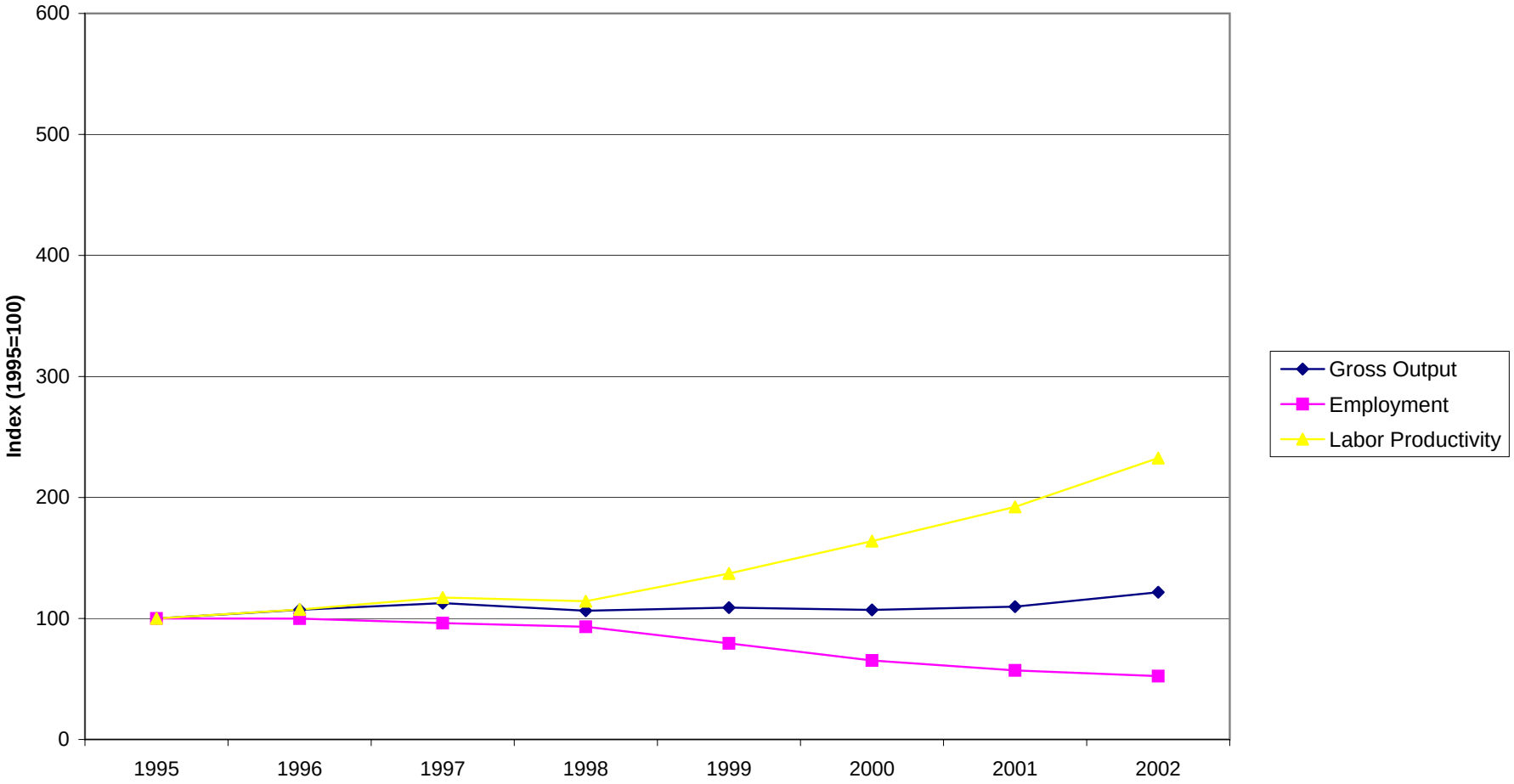


Notes:
1. U.S. and China industry matches are approximate, and the compositions in each country may differ greatly.
2. For Textiles in the U.S., NAICS 313, Textile Mills and NAICS 314 Textile Product Mills are combined.
3. For Chemical Manufacturing in China, Raw Chemical Materials and Chemicals; and Chemical Fibers are combined
Source: United States Bureau of Labor Statistics, National Bureau of Statistics of China, and TCB analysis

Figure-3: Growth of Private Firms Outstrips Government (1995-2002)											
	Total	**Aggregate Foreign**	Joint Ventures (Hong Kong, Taiwan, Macau)	Joint Ventures (Foreign)	Wholly Owned Foreign	**Aggregate Government**	State-Owned	Collective	**Aggregate Domestic Private**	Private Commercial	Joint-stock (shareholding)
Employment	**-2%**	**14%**	13%	8%	45%	**-9%**	-9%	-8%	**26%**	144%	25%
Labor Productivity	**17%**	**12%**	9%	17%	3%	**13%**	13%	12%	**9%**	13%	8%
Gross Ouput	**14%**	**28%**	23%	27%	49%	**3%**	3%	3%	**37%**	176%	35%

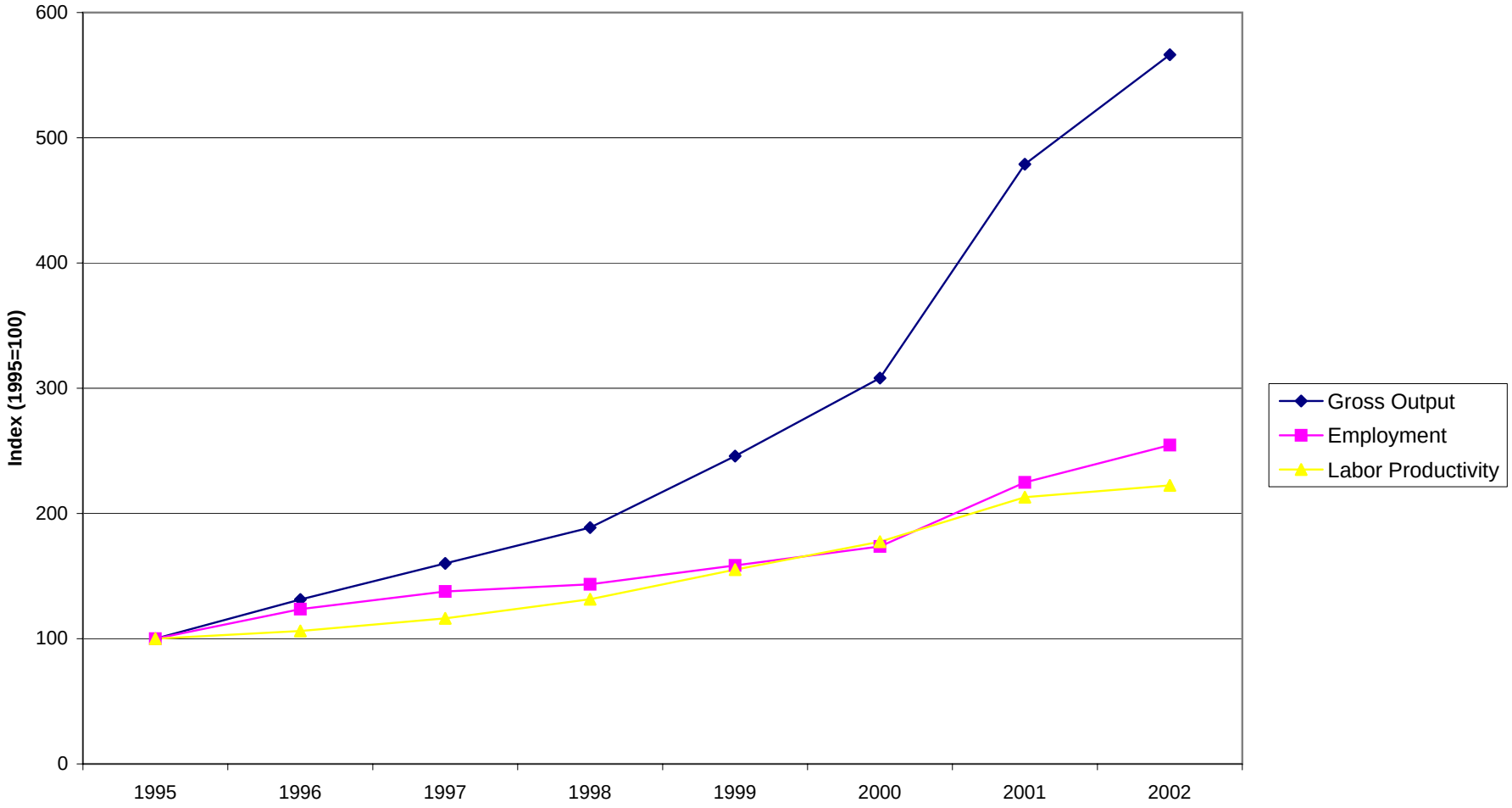
Notes:
1. Gross Output is in fixed 1990 prices. Labor productivity is output per employee.
2. When growth rates are low the rate of increase of employment plus labor productivity approximately equals output. This identity holds in the developed world where growth rates are generally below 4 percent. In China the rates are much higher, so the components do not exactly sum.
Source: National Bureau of Statistics of China and TCB analysis

Figure-4: State Enterprises Grow Productivity at the Cost of Jobs (1995-2002)



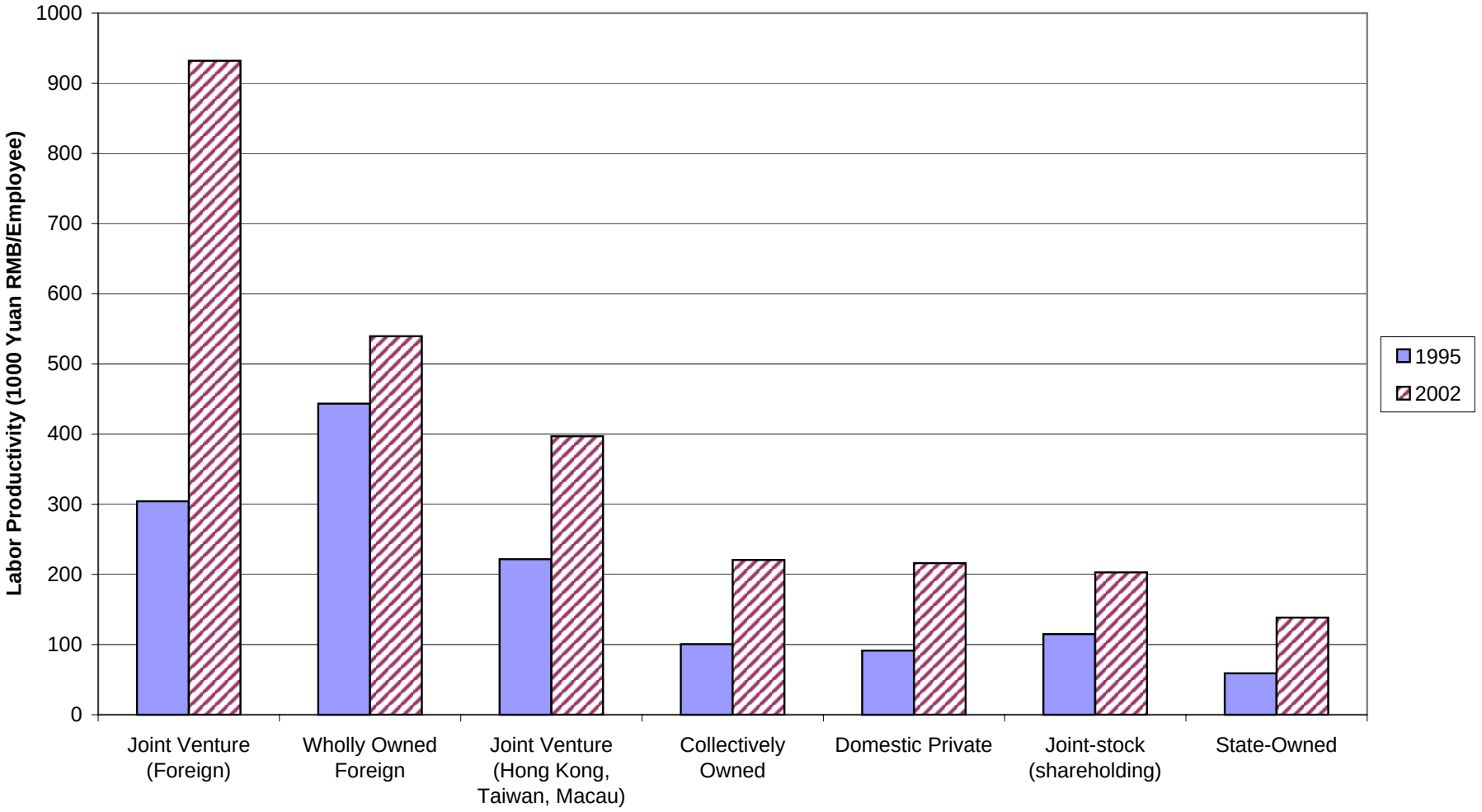
Note: State enterprises include SOEs and collectively owned enterprises. Output is in fixed 1990 prices. Labor productivity is output per employee.
Source: National Bureau of Statistics of China and TCB analysis

Figure-5: Foreign-Funded Enterprises Grow Employment, Productivity, and Output (1995-2002)



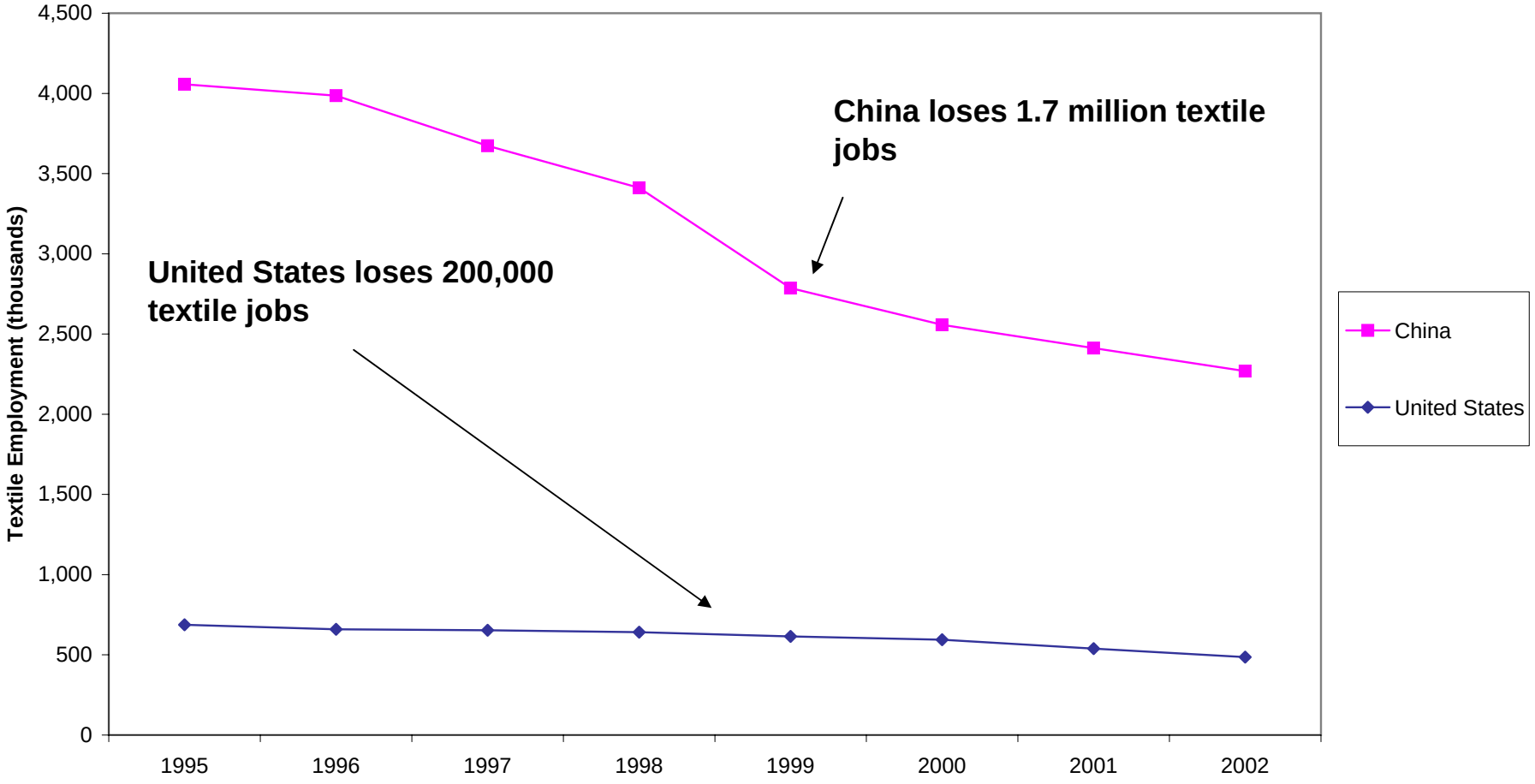
Notes: Foreign-funded firms include joint ventures with Hong Kong, Taiwan, and Macau, other foreign joint ventures, and wholly owned foreign enterprises. Output is in fixed 1990 prices. Labor productivity is output per employee.
Source: National Bureau of Statistics of China and TCB analysis

Figure-6: All Ownership Types Improve Productivity, But Foreign-Funded Maintain Lead



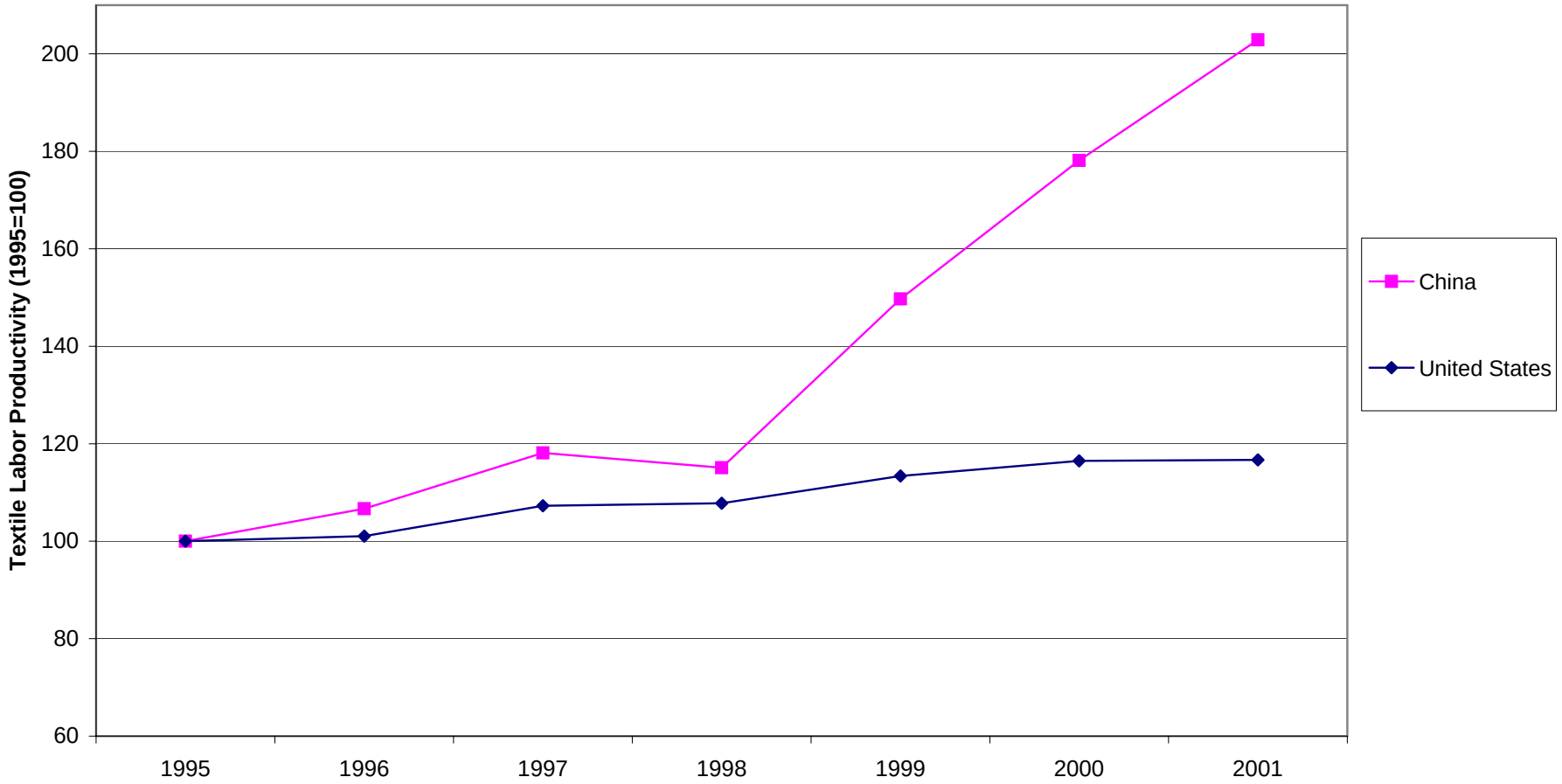
Note: Labor productivity is output per employee in fixed 1990 prices.
Source: National Bureau of Statistics of China and TCB analysis

Figure-7: China Loses Textile Jobs Much Faster Than the United States



Source: National Bureau of Statistics of China, BLS, and TCB analysis
Notes: China data are for large and medium firms only. U.S. data are for textile mills and textile product mills. Neither China nor U.S. data include apparel assembly.

Figure-8: Textile Labor Productivity Grows Six Times Faster Than U.S



Source: National Bureau of Statistics of China, BLS, and TCB analysis
Notes: China data are for large and medium firms only. U.S. data are for textile mills and textile product mills. Neither China nor U.S. data include apparel assembly. U.S. productivity is output per hour, China is output per employee.