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China's Export Production Profile

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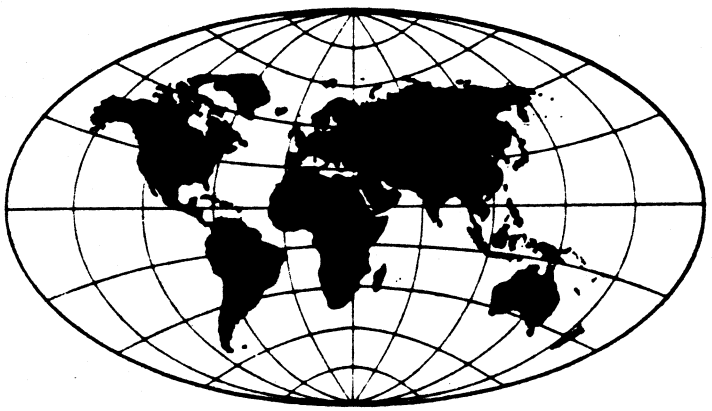

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SUMMARY

This study investigates export production in China based on three criteria: type of enterprise ownership, product categories, and provincial location. The study identifies and analyzes available disaggregated data on exports to better understand the conditions driving China's remarkable export growth.

In terms of ownership, detailed export data are available for foreign invested firms, and for town and township enterprises. Both of these types of enterprises have increased their contributions to exports while the share produced by state-owned enterprises has fallen. Preliminary estimates presented suggest the state share could be 60 percent or lower.

The product profile utilizes data on state-owned machine building, light industry, and town and township exports. A relationship between heavy industry and state exports, and between light industry and collective exports, is suggested. With all of these products, however, a variety of enterprises are involved in exporting.

Guangdong stands out in many of the variables that are used to investigate location patterns of export production. Even with the spread of export promotion to other parts of China, Guangdong continues to dominate many aspects of China's exports. Beyond Guangdong, a handful of coastal areas are the key exporters. If Shanghai and Liaoning are put together with Guangdong, these three areas alone supplied 40 percent of China's exports in 1991. Adding Jiangsu and Shandong brings the total to over 50 percent.

A set of data for individual provinces is presented to check for consistency with the cross-provincial data sets and to gain further insight into their export production patterns by ownership and product categories. Less than half of the provinces report this type of information. With the ones available, however, the relative importance of collective and light industrial exports in certain geographical areas is corroborated.

Finally, the results of cross-provincial correlation analysis is presented. This analysis provides a preliminary check on the impressions gained from the disaggregated data sets. The analysis identifies key variables that are positively related to past exports as a way to discuss what might affect China's future export potential. The data point to foreign investment and collectives as being positively related to exports. More general variables that proxy decentralization and openness are also found to be significantly related to provincial shares of exports and other export variables.

To check the extent that Guangdong, as an outlier, influences these results, the correlations are performed a second time without Guangdong in the sample. The results do not change substantially. One exception is that the openness variable, measured as the ratio of foreign investment to GDP, is no longer significantly related to exports.

PREFACE

The Center for International Research conducts economic and demographic studies, some of which are issued as Staff Papers. A complete list of these papers is included at the end of this report. The use of data generated by the U.S. Bureau of the Census precludes performing the same statistical reviews the Bureau does on its own data.

I would like to acknowledge Christina Harbaugh's meticulous work in combing sources in search for disaggregated export data. Andrea Miles helped extensively with the tables and report reproduction, and Loraine West and Barry Kostinsky provided valuable comments.

Comments and questions regarding this study should be addressed to Marc Rubin, Eurasia Branch, Center for International Research, Bureau of the Census, Washington, D.C. 20233; telephone (301) 763-4020.

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THE ORIGIN OF CHINA'S EXPORTS: ISSUES AND SCOPE

China's international exports have grown substantially since the leadership decided to advance economic development through an "open door" strategy. Less well understood by foreign observers is what types of enterprises and local conditions are driving China's exports. The purpose of this report is first to identify available disaggregated data on China's exports by type of enterprise, product groups, and location, and second to analyze these data for China's export production profile. Typically data incorporating all three aspects simultaneously are not available, but some data exist that cover one or two aspects.

Of the three aspects explored--enterprise type, product, and location--enterprise type is the most problematic. As China's economic system has developed and been reformed, the distinguishing characteristics of these categories of enterprises have changed and blurred. Typically the rules governing large and medium state-owned enterprises have changed the least, causing managers who wanted more flexibility and options to seek joint ventures with foreign firms, or to set up collectives for contracting parts or assembly operations. In 1992, the State Council issued more specific guidelines to supplement the 1988 law that was supposed to allow state enterprises more autonomy. This has led to a series of articles in the Chinese press discussing how state-owned firms are no longer state run.[1]

In addition, the categories of ownership types that China's institutions use to collect data have changed. In late 1992, the State Statistical Bureau and the State Industrial and Commercial Administration published a new categorization of nine enterprise types. The old categories included state-owned, collectives (including town and township collectives), individual, and other, which included private businesses and various foreign and joint venture firms. The new categories are state, collective, private, individual, joint-operations, joint-stock, foreign investment, Hong Kong-Macao-Taiwan investment, and other (FBIS-CHI-93-007, 12 January 1993, pp.32-33).

Along with the types of enterprises, the size of the non-state sector has grown relative to the state sector since the early 1980s. Table 1 provides the percent distribution of gross industrial output by ownership type of enterprise for each province in 1991.[2] From this table we can see that a wide variety of ownership structures exist across provinces. State enterprises contributed a high of 84 percent of industrial output in Tibet to a low of 30 percent in Zhejiang. Collective contribution to industrial output varied from a high of 61 percent in Zhejiang to a low of 9 percent in Hainan. The average state contribution to gross value of industrial output across provinces was 63 percent and the average collective contribution was 27 percent.

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[1]For example, Wu Naitao, "State-Owned Enterprises No Longer State Run," Beijing Review (16-22 November 1992), pp.17-21.

[2]Comparable figures for earlier years are not available.

Table 1. Gross Value of Industrial Output by Ownership and Province, 1991 (Percent)

Province	State owned	Collective owned	Individual owned	Other
Beijing	59.9	29.7	.9	9.4
Tianjin	57.1	34.7	1.2	7.0
Hebei	47.9	40.0	10.4	1.7
Shanxi	61.1	32.1	6.6	.2
Inner Mongolia	77.4	17.4	4.3	.9
Liaoning	60.3	28.1	7.2	4.4
Jilin	71.5	21.7	6.3	.4
Heilongjiang	81.1	15.8	2.6	.5
Shanghai	64.9	20.6	.1	14.4
Jiangsu	33.0	58.3	3.6	5.1
Zhejiang	29.5	60.9	6.8	2.8
Anhui	57.1	32.6	9.7	.7
Fujian	40.7	31.8	6.0	21.5
Jiangxi	63.0	27.9	8.2	.8
Shandong	40.0	51.3	7.8	.9
Henan	53.2	33.8	12.3	.7
Hubei	63.2	31.4	4.3	1.1
Hunan	62.8	29.2	7.4	.6
Guangdong	38.6	32.8	4.7	23.9
Guangxi	71.2	20.7	6.0	2.0
Hainan	71.1	8.8	4.2	15.9
Sichuan	62.6	28.7	7.8	.9
Guizhou	76.4	13.4	8.1	2.1
Yunnan	76.3	20.5	2.6	.5
Tibet	84.4	11.8	3.8	.0
Shaanxi	68.5	22.5	7.4	1.6
Gansu	78.1	17.7	4.1	.1
Qinghai	83.9	13.7	2.3	.0
Ningxia	78.9	16.1	3.8	1.1
Xinjiang	78.7	18.6	1.5	1.2

Source: China Statistical Yearbook, 1992, p.410.

The fourth column of table 1 presents "other" forms of ownership. This category is largely foreign invested enterprises, including joint ventures and wholly-owned foreign firms. The southern coastal provinces stand out in the importance of these firms. In Guangdong, 24 percent of gross value of industrial output originated in these other ownership forms. In Fujian, the contribution from these firms was 22 percent, and in Hainan it was 16 percent. The only other area that came close to these percentages was Shanghai, with 14 percent. Beijing was next with 9 percent and then Tianjin with 7 percent. All the rest were well below 7 percent. While these few geographical areas dominate, it is significant that all provinces, except Tibet, reported some industrial output produced by these new enterprise forms.

This study deals with export production, not sales by different types of trading companies. The introduction of local trading companies to compete with companies run by central government agencies has played a role in China's export success.[3] However, this facet of China's export promotion story is beyond the scope of this study.

This study focuses on the late 1980s and early 1990s. For some of the data series reported, the latest year is 1990. Since consistent information across variables is rarely available for any one year, however, this study draws from several close years to construct a plausible picture of China's export production profile at one point in time. In a few cases compatible data over time were available and have been reported as well.

The data search for this study was extensive. All types of printed materials from China were searched, including individual provincial yearbooks, national yearbooks, specialized sector publications, journals, and a wide variety of mainland, Hong Kong, and Taiwan newspapers. In 1993, China's custom administration began publishing detailed information on exports from foreign invested firms. Over time this source will provide a clearer picture of foreign capital's contribution to China's exports. The data profile presented in the next section represents the information that was available as of December 1993.

DISAGGREGATED CHINESE EXPORT DATA

This section presents disaggregated export data. In some cases the disaggregation falls into more than one category. For analytical purposes, each data set is discussed as part of one of three categories: ownership, product, or location

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[3]See Lardy (1990, pp.39-41) for a discussion of the decentralization of China s trading companies. Also, the first foreign-owned trading company was allowed to operate within China in 1992. The company is a subsidiary of C. Itoh & Co. Ltd of Japan set up in Pudong in Shanghai [Beijing Review (30 March-5 April 1992), pp 29 30]. It is currently restricted to operations within the special zone.

Ownership Profiles

The Chinese press often discusses production and exports of enterprises by different ownership types, but most of this information is anecdotal. While some production data by ownership are released by China's official statistical agencies, they do not usually indicate export production.

Foreign Companies and Joint Ventures

As of 1993, the export data availability situation changed for companies with foreign investment. The monthly bulletin, China's Customs Statistics Monthly, began to publish the value of exports from firms with foreign investment by province. The types of foreign enterprises included in this reporting are Sino-foreign contractual joint ventures, Sino-foreign equity joint ventures, and foreign-owned enterprises. Sino-foreign contractual joint ventures are what other Chinese sources refer to as sanlai yibu enterprises.[4] As these operations are primarily processing and assembly, they are less likely to have direct foreign investment, whereas Sino-foreign equity joint ventures and foreign-owned enterprises are more typical forms of direct foreign investment.

Export data for the first 6 months of 1993 are given in table 2. Two key points emerge. First, exports from foreign invested enterprises make up a substantial portion of China's exports. Twenty-five percent of China's exports originated from enterprises with foreign investment. (This figure is 21 percent if contractual joint ventures are excluded.). Since these figures have just begun to be published it is not possible to know how they compare with earlier years, or whether the first half of 1993 is representative of what is likely to occur throughout the year. However, 25 percent is comparable with previous estimates built on export earnings and information on the value of processing and assembly (Lardy 1990, p.143 and note 29).

With the disaggregated data published by the customs administration, we can also calculate the percentage of exports originating from enterprises that are fully owned by foreigners. For the first 6 months of 1993, this figure was 7 percent (China's Customs Statistics Monthly, no.6, 1993, pp.18-20). Whereas the other forms of foreign investment represent joint ventures, often with state-owned enterprises, these enterprises are fully private.

The second key point gained from table 2 is that while firms with foreign investment that are exporting to world markets are located all over China, exports from these firms are concentrated in a handful of coastal provinces. Time will tell the

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[4]Sanlai yibu enterprises refer to three types of processing and assembly, and one type of compensation trade. The processing types are lailiao jiagong and laiyang jiagong. The type of assembly operation is laijian zhuangpei. The compensation trade is referred to as changbu maoyi chukou.

Table 2. International Exports From Foreign Invested Enterprises, First Six Months, 1993

Province	Amount exported from foreign invested enterprises (million US$)	Amount exported from foreign invested enterprises, excluding contractual joint ventures (million US$)	Provincial share of exports from foreign invested enterprises (percent)	Provincial share of exports from foreign invested enterprises, excluding contractural joint ventures (percent)
Beijing	112.33	109.85	1.2	1.4
Tianjin	200.62	194.28	2.2	2.5
Hebei	51.99	49.94	.6	.6
Shanxi	20.31	19.76	.2	.3
Inner Mongolia	4.81	4.74	.1	.1
Liaoning	375.2	336.13	4.0	4.3
Jilin	16.74	15.02	.2	.2
Heilongjiang	27.35	26.85	.3	.3
Shanghai	577.85	558.2	6.2	7.1
Jiangsu	524.21	514.61	5.6	6.5
Zhejiang	318.78	309.31	3.4	3.9
Anhui	20.09	19.55	.2	.2
Fujian	935.32	888.63	10.0	11.3
Jiangxi	16.12	14.31	.2	.2
Shandong	276.73	260.24	3.0	3.3
Henan	16.98	16.88	.2	.2
Hubei	48.26	48.02	.5	.6
Hunan	16.59	16.33	.2	.2
Guangdong	5,611.92	4,350.31	60.2	55.1
Guangxi	42.45	35.92	.5	.5
Hainan	33.52	31.83	.4	.4
Sichuan	34.44	33.47	.4	.4
Guizhou	5.49	5.49	.1	.1
Yunnan	12.26	10.83	.1	.1
Tibet	.34	.34	.0	.0
Shaanxi	10.34	9.99	.1	.1
Gansu	2.2	1.61	.0	.0
Qinghai	N/A	N\A	.0	.0
Ningxia	.65	.39	.0	.0
Xinjiang	6.51	6.51	.1	.1
Total	9,320.40	7,889.34	100.0	
Percent of China's Total Exports That Came From Foreign Invested Enterprises			25.1	
Excluding contractual joint ventures			21.2	

Note: China's customs publishes exports from foreign invested enterprises by three types: sino-foreign contractual joint ventures, sino-foreign equity joint ventures, and foreign-owned enterprises.

Source: China's Customs Statistics Monthly, no.6 (1993), pp.3,18-20.

extent that the first half of 1993 was representative, but it is likely that the importance of exports from foreign firms in Guangdong and Fujian will continue for the foreseeable future.

Town and Township Enterprises

Data on exports from town and township enterprises by province have been published for the last several years. These data for 1990 are given in table 3.[5] These enterprises are officially deemed collective ownership, rather than private or state, but many analysts believe that they tend to make decisions quite similar to those of private enterprises in a market system.[6] Some of them have foreign investment and are sanlai yibu enterprises.

Data on exports from town and township enterprises are often separated into direct (zhijie chukou) and indirect exports (jianjie chukou).[7] This separation is reflected in table 3. Direct exports are delivered to Chinese trading companies, which are responsible for exporting them. Indirect exports are sold abroad through other channels, such as foreign buyers. Indirect exports also include goods that are processed or assembled by town and township enterprises for other enterprises, but the parent enterprise then exports the goods. When these enterprises process goods that are then exported by another enterprise, they earn a processing fee.[8]

Column 5 of table 3 gives the percentage of provincial exports (the sum of direct and indirect) originating in town and township enterprises. For some provinces, these percentages are very high. Jiangsu had the highest at 76 percent followed by Zhejiang with 61 percent.

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[5]Data similar to those in table 3 also exist for 1987 and 1989. See tables A1 and A2 in the appendix.

[6]See Zweig (1992) and Lardy (1992, p.129). Lardy even goes so far as to refer to these enterprises as entrepreneurial. In contrast, Victor Nee (1992) argues that because collectives are run by government agencies, albeit local agencies, they are like state-owned enterprises in that they suffer from inefficiencies resulting from soft budget constraints.

[7]Note that the Chinese definition for direct and indirect exports is counter-intuitive in terms of English. We might expect that direct exports do not involve an intermediary. However, the Chinese usage, at least in this case, is the opposite.

[8]When a processing fee is earned by one of the "sanlai yibu" town and township enterprises,it is reported with the value of exports in Chinese sources, but in a separate column.

Table 3. International Exports From Town and Township Enterprises by Province, 1990
(Current Chinese Yuan)

Province (1)	Total provincial exports (2)	Exports from Town and Township Enterprises: Direct exports (3)	Indirect exports (4)	Town & township exports (direct & indirect): Percent of provincial exports (5)	Percent of China's total exports (6)
Beijing	5,365,028,448	862,610,000	447,760,000	24.4	.4
Tianjin	20,342,949,600	1,846,980,000	484,520,000	11.5	.8
Hebei	8,308,801,056	1,191,650,000	701,640,000	22.8	.6
Shanxi	2,191,949,232	227,320,000	123,970,000	16.0	.1
Inner Mongolia	1,552,435,392	24,680,000	19,440,000	2.8	.0
Liaoning	26,785,920,000	1,708,630,000	477,540,000	8.2	.7
Jilin	3,595,627,104	125,610,000	52,810,000	5.0	.1
Heilongjiang	5,197,329,456	88,530,000	50,100,000	2.7	.0
Shanghai	25,433,805,024	3,589,940,000	1,982,100,000	21.9	1.9
Jiangsu	14,110,200,840	8,314,670,000	2,336,380,000	75.5	3.6
Zhejiang	10,806,875,088	5,178,740,000	1,366,290,000	60.6	2.2
Anhui	3,128,643,288	171,860,000	200,330,000	11.9	.1
Fujian	11,710,951,197	3,101,530,000	N/A	26.5	1.0
Jiangxi	2,685,623,304	182,780,000	119,730,000	11.3	.1
Shandong	16,344,816,216	3,156,190,000	1,275,360,000	27.1	1.5
Henan	4,146,508,248	515,400,000	416,830,000	22.5	.3
Hubei	4,519,693,512	472,040,000	253,830,000	16.1	.2
Hunan	4,236,096,063	639,370,000	196,240,000	19.7	.3
Guangdong	50,511,739,968	3,933,670,000	1,133,480,000	10.0	1.7
Guangxi	4,240,880,784	174,040,000	66,510,000	5.7	.1
Hainan	1,034,988,816	3,970,000	2,420,000	.6	.0
Sichuan	5,339,007,840	607,420,000	241,010,000	15.9	.3
Guizhou	732,058,715	32,740,000	42,610,000	10.3	.0
Yunnan	2,078,252,568	88,370,000	53,480,000	6.8	.0
Tibet	129,879,545	N/A	N/A	N/A	N/A
Shaanxi	2,202,663,600	59,030,000	27,160,000	3.9	.0
Gansu	888,431,568	59,650,000	12,540,000	8.1	.0
Qinghai	N/A	24,830,000	14,260,000	N/A	.0
Ningxia	1,753,138,464	31,010,000	6,550,000	2.1	.0
Xinjiang	N/A	27,690,000	17,470,000	N/A	.0
Total					
Calculated	239,374,294,937	Percent of China's exports (using calculated total)			20.3
Reported	296,993,671,000	Percent of China's exports (using reported total)			16.4

Notes: The provincial total and town/township enterprise trade figures are all compiled by MOFERT, the Ministry of Foreign Relations and Trade. The MOFERT figures are the sum of statistics reported by various enterprises. Total exports by province were reported in US dollars; we have converted these totals into yuan using the 1990 official exchange rate of US$1= 4.7832 yuan. Town/township enterprise exports were reported in yuan. "Direct" exports are purchased by state-owned import-export companies for sale on the international market. "Indirect" exports are sold abroad by other means, such as through arrangements made by joint ventures or wholly-owned foreign ventures with foreign buyers. MOFERT trade figures are not as high as Customs figures. The customs figure for China's total exports was used to calculate the percentages in the last column. This figure was $62.091 billion. It was converted to yuan using 4.7832 yuan per dollar.

Sources: Chen Yaobang. Zhongguo xiangzhen qiye nianjian, 1991 [Almanac of China's Town and township Enterprises, 1991]. Beijing: Nongye chubanshe, 1992. p. 178. China's Custom's Statistics Monthly, no.3 (1993), p.5.

The values for town and township exports may be inflated. There are reports that some companies set up shadow town or township enterprises. These shadow enterprises allow joint venture or state-owned enterprises to take advantage of the more flexible rules governing the collectives and to obtain export loans earmarked for town or township enterprises (Zweig 1991, pp.736-37). Counting exports of these shadow operations in town and township totals overstates their real share in trade. It is probably not the case, however, that the same exports are being counted as from the main enterprise in addition to the shadow town or township enterprise. On the other hand, some double counting may occur where contracts for processing or assembly are involved (Lardy 1992, p.170, note 29).

The last column of table 3 gives exports from town and township enterprises as a percent of China's total exports in 1990. According to these figures, 16 percent of China's total exports came from these enterprises. Nearly 4 percent of total exports came from town and township enterprises in Jiangsu alone. This figure is nearly 8 percent for the Jiangsu-Shanghai-Zhejiang triangle. Guangdong's share was less than 2 percent.

Comparing table 2 with table 3 suggests a hypothesis concerning non-state enterprises. It may be that some provinces with less access to foreign investment have relied more on collective firms for flexibility. In Jiangsu and Zhejiang, for example, exports originating in foreign invested firms were small while over half of their exports were produced in collectives. Joint ventures operate under different rules and preferences compared with Chinese state-owned enterprises. Collectives can also receive preferential treatment. More importantly, they tend to be smaller and by necessity operate outside the traditional planned networks. This appears to be especially true for town and township enterprises.

State-owned Enterprises

Although data do not exist for exports from state-owned enterprises, state exports can be roughly estimated indirectly. By looking at figures for the two available categories of non-state enterprises--foreign invested, and town and township, enterprises--it is possible to obtain an outer bound estimate.

Export data for the first half of 1993 indicate that exports from wholly-owned foreign firms and equity joint ventures accounted for 21 percent of China's total exports.[9] Town and township enterprises reportedly produced 16 percent of China's total exports in 1990, the most recent year these data are available. Assuming that this share was the same in 1993 as 1990, then approximately 37 percent of China's exports originated in the non-state sector. This implies that 63 percent of exports would have been produced in Chinese-owned state enterprises with no foreign investment. This 63 percent estimate does not take into account the exports from

[9]In these calculations exports from Sino-foreign contractual joint ventures are excluded because some of these are town or township enterprises.

other types of non-state enterprises, including collectives, joint ventures between domestic firms of different ownership forms, and domestic private firms. Taking these exports into account could put the state sector's share at 60 percent or less.

It should be reemphasized that since we only have figures for the first half of 1993, these estimates are subject to a wide margin of error.[10] We do not know whether the first half is representative of 1993, let alone 1990. Presumably this new data series will be continued, however, allowing estimates with more confidence in the near future.

Summary

Foreign firms are clearly important to China's exports. This is especially true in Guangdong and Fujian. Town and township enterprises are also big players in producing for international markets. Zhejiang and Jiangsu stand out in the importance of these enterprises in their exports. In contrast, the share of exports produced in state-owned enterprises has fallen to approximately 60 percent from near 100 percent before reforms began in the late 1970s.

Product Profiles

Two available data sets give detailed figures for exports of machinery and light industry, and one gives exports by product groups by province for town and township enterprises. These are discussed in turn.

State-owned Machine Building

In 1990, machinery and transport equipment represented 9 percent of China's total exports (State Statistical Bureau, 1992, p.618). Machine building capacity is believed to be dominated by state-owned enterprises, although exact figures are not available. A listing, however, of machinery exports in 1990 by central ministries and central corporations is available and reproduced in table A3 in the appendix. The products for export by these entities would originate primarily in the enterprises under their supervision, and therefore would be predominately state-owned.

The total amount of exports reported in table A3 is $3.772 billion. China's total exports in the machinery category was $5.588 billion in 1990. Therefore, the exports arranged by these central agencies represent over 67 percent of the machinery and transport equipment exports in 1990. They also represent 6 percent of China's total exports in that year.

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[10]The 60 percent estimate is in line with one given by Jan Prybyla (1993, p.10). He states that in 1991 non-state exports represented half of China's total exports, and over half of China's exports of manufactures. He does not, however, say how he arrived at this figure or give a reference.

Light Industry

In contrast to machinery, light industrial production is not thought to be state dominated, but figures on the ownership of enterprises where these exports originate are not available. Light industrial exports by province, however, are available and reported in table 4.

Guangdong was by far the greatest exporter of light industrial products in 1990. Guangdong exported nearly 9 billion yuan ($2 billion) representing 24 percent of the total amount of light industrial goods delivered for export in that year. The Jiangsu-Shanghai-Zhejiang area and Shandong also exported high shares of these goods.

Table 5 gives China's light industrial exports by product group for 1990. Arts and crafts; food and beverages; and leather, fur, and other products were the three largest groups in terms of percent of total light industrial exports. These three together comprised 40 percent of China's light industrial exports. The miscellaneous group "other" was the largest of any individual group at 17 percent. Compared with 1989, daily use machines (riyong jixie) and lighting appliances (zhaoming qiju) grew the most in percentage terms. What we cannot tell from tables 4 and 5 is how these export groups are distributed across provinces or in what types of enterprises they are produced.

Exports from Town and Township Enterprises By Product

For town and township enterprises, however, we have detailed, disaggregated export data. Exports by product categories, and by province and major city, are available for these types of enterprises for 1990, 1989, and 1987. The 1990 figures are given in table 6, while those for 1987 and 1989 are given in tables A4 and A5 in the appendix.

The rich export data in table 6 show that there is a difference in the types of products these enterprises export across provinces. For example, calculations using the figures in this table show that Guangdong is the largest exporter of light industrial products at 24 percent.[11] In other words, Guangdong supplied 24 percent of the

[11]Note that the product categories appear to be different in table 6 compared with table 5. In table 5 some of the categories included in table 6 were considered part of light industry rather than separate categories.

Table 4. Value of Light Industry Products Delivered For Export By Province and Major City, 1990

Province	Delivered exports million current yuan	Percent of total delivered exports of light industrial products	Major cities	Delivered exports
Beijing	495.90	1.34	Guangzhou	2,848.98
Tianjin	1,047.22	2.82	Qingdao	924.76
Hebei	969.77	2.62	Shenzhen	813.49
Shanxi	384.33	1.04	Ningbo	693.79
Inner Mongolia	200.68	.54	Xiamen	417.25
Liaoning	882.90	2.38	Nanjing	244.08
Jilin	340.42	.92	Dalian	232.34
Heilongjiang	352.27	.95	Chongqing	206.96
Shanghai	3,307.72	8.92	Wuhan	156.37
Jiangsu	4,057.76	10.94	Chengdu	145.56
Zhejiang	3,971.13	10.71	Shenyang	137.47
Anhui	449.29	1.21	Harbin	136.25
Fujian	2,555.24	6.89	Xi'an	128.72
Jiangxi	536.88	1.45	Changchun	98.44
Shandong	3,999.99	10.79		
Henan	832.41	2.24		
Hubei	747.75	2.02		
Hunan	742.57	2.00		
Guangdong	8,857.74	23.89		
Guangxi	746.19	2.01		
Hainan	16.83	.05		
Sichuan	920.05	2.48		
Guizhou	35.19	.09		
Yunnan	102.18	.28		
Tibet	N/A	N/A		
Shaanxi	221.53	.60		
Gansu	105.44	.28		
Qinghai	25.20	.07		
Ningxia	19.52	.05		
Xinjiang	160.49	.43		
Total	37,084.59	100.00		

Source: China Light Industry Yearbook, 1991, p.104.

Table 5. China's Light Industrial Exports By Product, 1990

Product	Value delivered for export million yuan	Percent of total	Percent change over 1989
Paper	1,074.13	2.9	-5.9
Daily use machines	2,673.13	7.1	51.0
Daily use silicate	1,274.84	3.4	5.5
Light bulbs	405.72	1.1	25.9
Daily use chemical products	1,468.54	3.9	22.3
Manufactured salt	151.37	.4	34.7
Food & beverages	4,803.20	12.8	-1.3
Leather, fur & other products	4,297.69	11.4	38.4
Wood, bamboo, etc. products	113.48	.3	19.6
Furniture	257.92	.7	23.3
Culture, education & sports	1,590.86	4.2	11.6
Arts & crafts	5,944.65	15.8	2.6
Silk products	1,123.58	3.0	20.9
Metal products	3,385.48	9.0	15.2
Household appliances	1,158.11	3.1	-8.1
Lighting appliances	812.70	2.2	133.7
Weighing apparatus	8.80	.0	-15.9
Daily use sundry goods	537.68	1.4	9.9
Machine building	238.84	.6	29.1
Other	6,285.25	16.7	18.1
Total	37,605.97	100.0	

Source: China Light Industry Yearbook, 1991, p.104.

Table 6. Value of Exports From Town and Township Enterprises By Product Type, By Province and Major City, 1990
(Million current yuan)

Province	Chemical industry		Machinery		Minerals		Light industry		Food industry		Local products		Livestock products	
	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	3.08	1.04	44.56	15.49	5.48	4.25	114	48.34	14.26	8.84	.6	0	12.54	4.52
Tianjin	178.04	156.41	67.74	64.35	183.52	162.56	346.51	214.46	130.16	128.27	40.67	26.21	81.87	80.32
Hebei	193.22	149.85	146.96	108.43	37.64	28.77	251.85	145.06	216.59	183.98	37.38	26.74	174.82	99.32
Shanxi	38.51	36.79	28.06	20.24	129.76	58.1	4.82	4.64	8.93	8.89	5.28	5.06	15.75	.78
Inner Mongolia	0	0	5.35	.15	13.96	12.13	0	0	.45	.42	1.07	.27	3.91	3.6
Liaoning	68.9	46.56	183.1	158.53	329.51	145.81	106.7	79.11	739.96	636.75	79.23	76.62	85.35	72.78
Jilin	22.58	22.28	14.9	11.23	9.25	4.31	22.6	16.52	54.42	38.02	14.49	5.32	6.75	5.98
Heilongjiang	2.92	2.18	17.93	10.02	19.49	15.17	15.14	13.59	28.45	20.24	6.08	2.39	9.76	7.61
Shanghai	121.5	77.9	111.44	71.8	317.45	204.47	547.21	352.96	337.06	218.13	55.52	35.7	100.18	64.5
Jiangsu	825.6	690.36	856.07	681.21	59.72	59.67	1334.16	1074.99	352.94	299.11	33.04	31.99	164.22	139.95
Zhejiang	154.78	133.69	445.34	353.97	269.09	221.85	461.34	394.14	416.07	342.35	120.39	107.32	306.79	258.01
Anhui	15.22	13.26	16.35	7.34	9.33	3.75	30.05	12.97	62.82	37.33	25.65	4.96	35.25	9.62
Fujian	37.08	37.08	20.96	20.96	95.65	95.65	969.5	969.5	333.61	333.61	52.98	52.98	26.65	26.65
Jiangxi	11.53	4.37	0	0	36.87	7.64	33.07	24.68	34.3	28.5	11.42	2.9	4.67	2.74
Shandong	315.06	300.11	362.74	329.31	405.95	210.99	342.52	289.21	960.44	750.99	55.22	50.47	202.68	157.18
Henan	69.44	48.42	58.22	40.37	84.48	47.65	49.24	30.19	35.21	20.23	13.31	8.63	117.03	36.8
Hubei	72.7	54.44	37.34	25.43	32.11	28.32	45.54	28.52	32.03	17.79	18.96	10.96	25.05	20.13
Hunan	121.89	93.11	25.46	20.33	114.24	85.25	93.76	89.27	85.53	64.83	35.62	27.65	6.05	3.62
Guangdong	60.48	52.75	152.77	77.76	54.97	27.05	1,542.53	1,318.54	201.37	170.36	65.74	54.09	286.16	248.24
Guangxi	32.11	23.54	.13	.13	35.79	24.23	9.03	4.24	12.85	9.2	5.93	4.65	8.28	6.5
Hainan	.04	.04	0	0	1.74	.13	.25	.25	.38	.38	.46	0	0	0
Sichuan	61.31	31	18.76	13.84	18.9	1.94	14.69	5.97	83.27	57.52	7.9	6.11	77.24	53.84
Guizhou	6.14	2.02	16.52	0	43.71	24.62	.9	.54	1.48	1.01	0	0	1.29	1.29
Yunnan	13.76	1.35	7.29	0	75.29	56.37	5.03	4.17	19.18	10.21	3.34	3.34	0	0
Tibet	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shaanxi	13.23	8.9	1.42	.04	33.8	32.8	6.97	1.76	3.74	2.87	.29	.29	6.63	4.7
Gansu	5.93	5.43	0	0	3.75	3.4	1.79	1.22	16.39	14.89	6.03	5.33	9.28	8.3
Qinghai	0	0	0	0	0	0	0	0	0	0	0	0	.67	.28
Ningxia	.46	.46	.06	.06	22.68	19.58	1.28	1.28	3.86	2.52	5.08	3.72	2.92	2.17
Xinjiang	24.23	9.96	0	0	5.83	5.83	1.1	0	.44	.44	0	0	.71	.71
Total (calculated)	2,469.74		2,639.47		2,449.96		6,351.58		4,186.19		701.68		1,772.5	
Percent of Total	5.1		5.4		5.0		13.1		8.6		1.4		3.6	
CITIES														
Chongqing	29.75	12.53	6.89	3.97	17.34	1.94	8.71	1.61	27.05	19.04	5.83	4.23	8.41	8.18
Xi'an	.93	0	.75	.04	0	0	1.18	.42	.5	.5	.29	.29	3.09	2.37
Wuhan	13.31	5.55	19.44	11.65	17.58	17.58	12.52	7.17	12.18	9.72	2.39	2.39	10.86	8.93
Guangzhou	1.2	1.2	18.52	18.52	.16	.16	91.31	90.53	3.83	3.53	4.88	4.88	2.44	.96
Shenyang	4.42	4.27	19.38	17.57	2.64	2.64	9.64	4.93	13.61	13.61	3.84	3.84	3.62	3.62
Dalian	17.06	10.71	26.24	10.44	1.57	0	37.93	24.76	131.54	29.7	1.92	.37	0	0
Harbin	0	0	8.91	1	.26	0	.21	0	0	0	0	0	.4	0
Qingdao	101.71	97.82	123.37	115.98	311.75	132.28	128.26	94.69	150.91	118.27	0	0	13.93	.18
Nanjing	20.44	6.44	3.19	2.91	0	0	24.26	16.54	.1	.1	0	0	.11	.11
Ningbo	24.33	21.94	82.47	67.95	67.79	50.35	76.62	63.88	62.42	60.68	19.94	18.28	19.79	18.86
Chengdu	10.19	8.02	7.51	6.21	0	0	.29	.29	4.34	2.64	0	0	48.12	30.59
Xiamen	.26	.26	0	0	11.85	11.85	6.49	6.49	52.24	52.24	6.53	6.53	0	0
Changchun	.3	.3	13.2	9.53	.07	.07	1.04	.16	19.35	18.35	0	0	5.81	5.04

Table 6. Value of Exports From Town and Township Enterprises By Product Type, By Province and Major City, 1990 (continued)
(Million current yuan)

Province	Textile industry		Silk industry		Garments		Arts & crafts industry		Other	
	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	157.62	130.43	.47	.35	532.26	383.87	333.19	209.39	92.31	56.09
Tianjin	244.68	194.33	15.59	14.49	646.52	515.09	196.75	125.37	199.45	165.12
Hebei	41.76	23.61	3.87	1.43	124.79	87.03	467.6	206.98	196.81	130.45
Shanxi	7.51	1.67	0	0	5.12	5.12	5.5	3.5	102.55	82.53
Inner Mongolia	.14	0	.38	.38	0	0	13.38	3.28	5.48	4.45
Liaoning	72.86	51.7	31.98	23.55	307.8	287.89	51.37	41.95	129.41	87.38
Jilin	1.11	.51	.83	.83	2.85	1.8	4.25	2.44	24.39	16.37
Heilongjiang	20.6	7.67	0	0	1.2	0	5.03	3	12.03	6.66
Shanghai	786	506.52	1,154.98	744.69	1,219.71	785.63	575.13	370.98	245.86	156.66
Jiangsu	3,485.65	2,749.76	865.71	742.16	1,084.58	638.42	890.48	658.49	698.88	548.56
Zhejiang	1,599.67	1,377.28	647.42	386.86	743.66	497.62	877.92	749.23	502.56	356.42
Anhui	36.92	24.95	33.31	9.97	18.76	9.28	51.53	26.32	37	12.11
Fujian	63.68	63.68	3.45	3.45	451.39	451.39	357.08	357.08	689.5	689.5
Jiangxi	35.79	13.66	.14	.14	7.27	7.27	82.2	71.33	45.25	19.55
Shandong	456.87	292.81	26.49	21.79	196.63	130.29	722.59	331.74	384.36	291.3
Henan	46.87	27.65	8.63	6.37	34.68	29.83	308.11	180.29	107.01	38.97
Hubei	141.03	49.44	3.26	2.69	201.38	166.9	48.26	32.69	68.21	34.73
Hunan	16.57	10.3	4.83	3.73	4.47	1.07	247.07	201.72	80.12	38.49
Guangdong	435.3	384	13.47	12.03	790.2	627.96	742.21	450.64	721.95	510.25
Guangxi	4.11	1.12	6.12	0	.55	.32	97.87	80.36	27.78	19.75
Hainan	.19	.19	0	0	0	0	.15	0	3.18	2.98
Sichuan	430.45	344.58	74.14	51.11	7	.62	13.27	10.69	41.5	30.2
Guizhou	.09	.06	0	0	0	0	.09	.09	5.13	3.11
Yunnan	1.75	0	10.58	10.58	0	0	1.55	1.55	4.08	.8
Tibet	0	0	0	0	0	0	0	0	0	0
Shaanxi	0	0	0	0	.58	0	18.6	7.67	.93	0
Gansu	.5	.5	.17	0	.4	.4	16.26	9.12	11.69	11.06
Qinghai	0	0	0	0	0	0	7.6	2.28	30.82	22.27
Ningxia	0	0	0	0	0	0	.12	.12	1.1	1.1
Xinjiang	5.05	5.05	2.19	2.19	0	0	3.51	3.51	2.1	0
Total (calculated)	8,092.77		2,908.01		6,381.8		6,138.67		4,471.44	
Percent of Total	16.7		6.0		13.1		12.6		9.2	
CITIES										
Chongqing	168.67	139.85	10.06	10.06	.59	.42	.11	.08	18.44	17.03
Xi'an	0	0	0	0	.24	0	8.04	.02	.29	0
Wuhan	11	8	.35	0	1.99	1.99	2.66	1.4	14.99	8.4
Guangzhou	15.45	15.45	0	0	118.64	107.04	30.91	16.96	47.14	42.62
Shenyang	2.85	2.38	0	0	32.8	30.23	8.45	5.76	16.91	12.16
Dalian	1.68	.53	6.86	6.86	22.8	11.83	.88	0	15.71	.78
Herbin	0	0	0	0	0	0	.64	0	1.44	1.44
Qingdao	153.02	84.23	1.24	1.24	45.92	38.93	153.33	72.47	75.61	62.3
Nanjing	6.91	5.88	11.81	10.07	72.53	37.21	14.77	13.55	16.77	13.83
Ningbo	330.33	286.68	31	29.64	146.69	100.65	124.96	97.91	150.54	114.91
Chengdu	0	0	0	0	0	0	1.35	1.06	7.85	3.16
Xiamen	0	0	0	0	6.05	6.05	2.87	2.87	25.49	25.49
Changchun	1.11	.51	0	0	1.01	.96	1.67	.3	1.21	.66

Source: China Town/township Enterprises Yearbook 1991, pp. 178-185.

light industrial exports from town and township enterprises.[12] Chemicals and machinery exports from town and township enterprises are much more important in Jiangsu, Shandong, and Zhejiang than in Guangdong. Food exports are larger in Liaoning and Shandong than in the other areas. Textiles and silk exports are more important to Jiangsu and Zhejiang, while garment exports are important to many areas. In terms of total exports by these enterprises, textiles represented 17 percent, followed by garments, light industry, and arts and crafts, which represented approximately 13 percent each.

Table 7 summarizes changes in the export situation of these enterprises over the second half of the 1980s. According to this source, by 1990 there were over 57,000 town and township enterprises that exported 50 percent or more of their output. These enterprises delivered over 48 billion yuan ($10 billion) of goods for export representing 24 percent of China's total value of goods purchased for export.[13] These enterprises earned 8 billion yuan ($1.7 billion) in processing fees from foreign firms or joint ventures, and nearly 7,000 of these enterprises have some type of foreign investment or foreign cooperation.

Table 7 also summarizes the product composition of exports from town and township enterprises from 1988 to 1990. These types of enterprises have contributed the most to China's garment exports--as high as 72 percent in 1990. These enterprises have also contributed 45 percent of China's arts and crafts exports, and over a quarter of China's chemical, silk, and light industrial exports.

Summary

The disaggregated information presented in this section suggests that machine building is dominated by state enterprises while light industry is dominated by collectives. This is a question of degree, however. For example, the information in table A3 suggests that 67 percent of China's machinery exports were arranged by central agencies in 1990. But according to table 7, another 22 percent of China's machinery exports were produced in and township enterprises. If these categories could be decomposed further, it may be that the products being exported by the two

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[12]It is just coincidence that Guangdong also exports 24 percent of the total amount of light industrial products delivered for export reported in table 4.

[13]The 24 percent seems high. Note that in table 3 the percentage of exports generated by town and township enterprises was reported as 16 percent if China's reported custom's total is used, and 20 percent if the provincial sum is used. The reason for this discrepancy is not clear. These two sets of data come from the same town and township yearbook. The figure in table 7 is taken directly from the source while the ones in table 3 are the author's calculations. One source of discrepancy may be that these calculations involve conversion from $US to yuan and therefore are sensitive to the rate used.

Table 7. Indicators of Town and Township Exports Over Time, 1986-1990

	1986	1987	1988	1989	1990
Number of enterprises					
Exporting over 50% of output	6,000	9,700	10,700	24,200	34,600
Over 80%	4,100	7,800	14,300	20,800	23,200
Total	10,100	17,500	25,000	45,000	57,800
Value of Products					
Delivered for export (billion yuan)	9.95	16.20	26.87	37.14	48.56
Percent change from previous year		62.80	65.90	27.70	30.70
Percent of China's total goods purchased for direct export	11.10	14.90	19.10	21.90	24.40
Payment received for processing by sanlai yibu enterprises (billion yuan)	1.08	2.43	2.94	5.12	8.03
Percent change from previous year		56.40	17.30	42.60	88.40
Enterprises with foreign investment or cooperation number	2,405	2,996	4,762	5,915	6,987
Percent change from previous year		24.60	68.90	19.50	18.20

	1988		1989		1990	
Product	Billion yuan	Percent of China's total	Billion yuan	Percent of China's total	Billion yuan	Percent of China's total
Garments	3.0	49.6	4.9	65.2	6.4	72.0
Arts & crafts	3.8	39.0	4.8	43.1	6.1	45.0
Chemicals	1.5	23.6	2.1	36.3	2.5	27.3
Silks	1.3	21.4	2.0	25.1	2.9	24.3
Light industry	2.9	19.3	3.9	22.8	6.4	28.5
Textiles	4.3	16.4	6.1	19.2	8.1	21.9
Machinery	1.1	16.2	1.8	19.6	2.7	21.8
Foodstuffs	2.7	12.9	3.5	19.3	4.2	15.5
Mining	1.4	12.5	1.9	15.9	2.5	15.8
Local products	1.6	8.3	2.2	9.2	2.5	10.4
Other	3.3	25.2	4.1	61.1	4.5	24.5

Sources: Chen Yaobang. Zhongguo xiangzhen qiye nianjian, 1991 [Almanac of China's Town and township Enterprises, 1991]. Beijing: Nongye chubanshe, 1992. p. 280-281.

Note: These figures include only direct exports and the processing fee for indirect exports, but not the value of indirect exports.

enterprise groups are substantially different. Even so, if 67 percent of the exports are from state-owned enterprises, this still leaves 33 percent originating from other types of enterprises.

A second observation developed in this section is that town and township enterprises are very important contributors to China's exports overall. They export more in certain categories, such as garments, but they export a wide variety of products. The contribution of these enterprises to exports has also grown substantially over time.

Finally, although town and township enterprises are more important to certain provincial economies, they appear to generate export earnings all over China. They also have close ties to foreign capital.

Location Profiles

This section deals with total exports by geographic location. The ownership and product profiles have already revealed an importance of the coastal areas in terms of light industrial exports and exports from foreign enterprises. This section provides a broader picture of exports by area.

Provincial Exports

Consistent export data by province over time are not readily available. Some figures are reported by the former Ministry of Foreign Trade and Economic Relations (MOFERT), called the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) as of 1993. Other figures are reported by China's customs administration. Additional data are reported by provincial offices. The problem with these numbers is that they are not the same across reporting units due to differences in coverage, disaggregation, the monetary unit used, and timing. For example, MOFTEC figures are the sum of exports reported by various enterprises, while customs figures are collected at the borders. As a result, MOFTEC trade figures are not as high as customs figures. For this reason some of the calculations in this study distinguish between a reported and a calculated total export figure. Using both the customs and MOFTEC figures, table A6 provides our current best accounting of exports by province between 1985 and 1992, all reported originally in U.S. dollars in the Chinese sources. The figures between 1985 and 1989 are from a single MOFERT source. The figures for 1990-1992 were reported by individual provincial statistical offices and are believed to be consistent with MOFERT's reports. In 1993, customs began publishing their data by province (see table 9, column 2).

Based on the data from table A6 and elsewhere, table 8 provides several indicators of exports by province. To take account of the differences in data sources, several growth rates were calculated. The second column gives average annual growth in exports between 1985 and 1989 valued in current U.S. dollars. All

Table 8. International Export Indicators By Province: 1985-1989

	Average annual growth in exports			Each province's share of total exports		Provincial exports as a percent of provincial	
	1985-89	1985-91	1985-1992	1989	1991	GDP 1989	GNP 1991
Beijing	12.5	11.3	11.3	2.9	2.2	9.6	13.0
Tianjin	7.6	4.7	5.2	4.1	2.5	22.4	25.3
Hebei	4.6	4.2	3.9	4.0	2.8	8.0	9.6
Shanxi	11.3	11.6	11.8	1.0	0.8	4.3	6.3
Inner Mongolia	17.9	15.9	N/A	0.8	0.7	4.9	6.9
Liaoning	-2.5	1.9	2.5	10.9	9.1	18.2	28.5
Jilin	9.4	12.5	14.0	1.7	1.6	7.1	12.9
Heilongjiang	17.9	17.0	18.4	2.5	2.2	6.6	10.0
Shanghai	8.1	7.6	8.4	12.4	9.1	27.2	35.5
Jiangsu	9.0	11.4	13.7	6.0	5.5	7.5	12.6
Zhejiang	13.9	16.2	17.2	4.6	4.6	8.9	15.7
Anhui	12.4	11.9	12.4	1.4	1.1	3.7	6.2
Fujian	24.4	25.5	27.0	4.1	4.6	15.1	27.8
Jiangxi	12.6	11.4	12.9	1.3	1.0	5.3	7.0
Shandong	2.8	5.2	7.2	7.5	6.1	9.8	13.0
Henan	16.0	14.9	15.8	2.0	1.7	3.7	5.6
Hubei	13.2	11.2	12	2.5	1.8	5.5	7.2
Hunan	10.4	13.5	15.9	1.6	1.6	3.9	6.9
Guangdong	20.3	21.9	22.9	20.1	21.7	23.4	40.8
Guangxi	9.0	11.5	13.6	1.4	1.3	6.3	9.8
Hainan	29.8	30.2	29.8	0.9	1.1	15.6	32.9
Sichuan	20.0	19.0	18.1	2.3	2.1	3.6	5.5
Guizhou	26.2	23.7	23.0	0.3	0.3	2.1	3.4
Yunnan	21.3	16.2	15.5	0.9	0.6	4.5	4.9
Tibet*	27.2	16.5	16.7	0.0	0.0	3.4	2.8
Shaanxi	26.1	25.2	25.0	0.9	1.0	4.3	7.5
Gansu	15.4	18.1	20.0	0.4	0.4	2.7	5.2
Qinghai	20.3	18.1	18.1	0.1	0.1	3.6	5.5
Ningxia	12.1	13.9	14.9	0.2	0.1	4.2	7.1
Xinjiang	13.9	10.0	11.5	0.9	0.6	6.3	6.2

Note: The sum of reported provincial exports (table A6) was used to calculate the percent of total exports. To obtain exports as a percent of GDP or GNP, 1989 exports were converted to yuan using a 3.7651 yuan/$ exchange rate for 1989, and a 5.3094 yuan/$ exchange rate for 1991.

Sources: Exports: table A6; , 1989 GDP: Compilation of Historical Data on Each Province; 1991 GNP: China Statistical Yearbook, 1992, p. 36.

provinces had positive growth except Liaoning.[14] Growth rates ranged from -3 in Liaoning to 30 percent in Hainan. The average across provinces was 9 percent. Columns 3 and 4 give annual export growth rates between 1985 and 1991, and 1985 and 1992. A number of areas experienced increases in exports above 20 percent: Fujian, Guangdong, Hainan, Guizhou, and Shaanxi.

Although many provinces experienced rapid export growth, by 1991 three areas still stood out as the major contributors to China's total exports. Guangdong contributed 22 percent, followed by Shanghai and Liaoning, each at 9 percent (column 6). These three together accounted for 40 percent of China's exports. If Shandong and Jiangsu are included, these five areas produced over 50 percent of the total exports. Part of the importance of these areas is that they have major port cities. Raw materials or semi-finished products travel to these areas to be processed and then exported.[15] It is also interesting to note that provinces like Jiangsu and Zhejiang, which had high percentages of exports from town and township enterprises, are also important to China's overall export structure, but not on the same scale as the areas with special economic zones.

The last column in table 8 gives the value of exports as a percent of provincial gross domestic product (GDP) for 1991. Here, too, Guangdong stands out. In that year, exports were more important to Guangdong's economy than any other area. Guangdong's exports as a percent of GNP were 41 percent in 1991 compared with 23 percent in 1989. In 1989 Shanghai's exports as a percent of GDP were the highest.

The most recent export data by province are given in Table 9 for the first 6 months of 1993. Based on these data Guangdong's share of total provincial exports was 42 percent, which implies that the province's importance to China's foreign trade has continued to increase.

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[14]In 1985, Liaoning's exports represented over 20 percent of China's exports. Petroleum exports were an important component of this export value. Changes in petroleum prices and demand can probably explain a large part of this decrease.

[15]From the newly released export figures for 1993 it appears that it is not the case that exports are high in areas with ports simply because exports from elsewhere are being attributed to those areas. Separate figures for exports from ports themselves are also published. For example, exports from the port of Tianjin in the first half of 1993 were 5213 million US$ while exports from the "province" of Tianjin were 1054 million US$ (China's Customs Statistics Monthly, no. 6, June 1993, pp.16-17, 21).

Table 9. International Exports By Province, First Six Months, 1993

Province (1)	Total provincial exports million $US (2)	Percent of total exports by province (3)	Exports from foreign invested firms million $US (4)	Percent of exports that originate in foreign invested firms (5)	Percent of each province's exports that originate in foreign invested firms, excluding contractual joint ventures (6)
Beijing	958.42	2.3	112.33	11.7	11.5
Tianjin	1,053.92	2.8	200.62	19.0	18.4
Hebei	618.61	1.7	51.99	8.4	8.1
Shanxi	336.75	.9	20.31	6.0	5.9
Inner Mongolia	198.65	.5	4.81	2.4	2.4
Liaoning	1,608.71	4.3	375.20	23.3	20.9
Jilin	618.72	1.7	16.74	2.7	2.4
Heilongjiang	1,633.01	4.4	27.35	1.7	1.6
Shanghai	2,804.77	7.6	577.85	20.6	19.9
Jiangsu	2,206.35	5.9	524.21	23.8	23.3
Zhejiang	1,825.69	4.9	318.78	17.5	16.9
Anhui	301.56	.8	20.09	6.7	6.5
Fujian	1,958.23	5.3	935.32	47.8	45.4
Jiangxi	233.24	.6	16.12	6.9	6.1
Shandong	1,888.12	5.1	276.73	14.7	13.8
Henan	396.28	1.1	16.98	4.3	4.3
Hubei	487.73	1.3	48.26	9.9	9.8
Hunan	433.13	1.2	16.59	3.8	3.8
Guangdong	15,541.12	41.8	5,611.92	36.1	28.0
Guangxi	468.57	1.3	42.45	9.1	7.7
Hainan	175.73	.5	33.52	19.1	18.1
Sichuan	460.09	1.2	34.44	7.5	7.3
Guizhou	90.97	.2	5.49	6.0	6.0
Yunnan	273.73	.7	12.26	4.5	4.0
Tibet	20.44	.1	0.34	1.7	1.7
Shaanxi	227.33	.6	10.34	4.5	4.4
Gansu	101.29	.3	2.20	2.2	1.6
Qinghai	24.22	.1	N/A	N/A	N/A
Ningxia	32.63	.1	0.65	2.0	1.2
Xinjiang	170.82	.5	6.51	3.8	3.8
Total		100.0			
Calculated	37,148.83				
Reported	37,148.82				

Source: China Customs Statistics Monthly, no.6 (1993), pp.16-17, and Table 2.

Special Economic Areas

An aspect of the location profile is how important the economic areas with special export incentives are in terms of their contribution to exports. Table 10 provides a summary of these exports for the first 6 months of 1993. Exports from these specially designated areas represented 18 percent of China's total exports.

The special economic zones (SEZ) accounted for most of the exports from the special areas. This figure for the first 6 months of 1993 was approximately 85 percent. The development and bonded areas are much smaller, usually newer, and less developed. Within the SEZs, an average of 42 percent of exports were produced by foreign invested firms. This ranged, however from a high of 66 percent in Zhuhai to 20 percent in Hainan. The importance of special areas varies greatly by province as well. In Guangdong, where three SEZ's are located, only 27 percent of provincial exports originated in these special areas. This may be because some foreign investment is not restricted to the special areas, and because many domestic firms are involved in export. In contrast, 96 percent of Hainan's exports reportedly originated in the special areas.[16] In Fujian, with the Xiamen SEZ, 38 percent of exports were produced in special areas.

Individual Provinces and Major Cities

Some of China's provinces and cities publish disaggregated export data in their annual yearbooks. Table 11 reports these data for 1990 or 1991. There is little consistency in how these areas report data, and the information is often different from both MOFTEC and customs information. The most common reported disaggregated data were for industrial exports. These were often available by light and heavy industry, and sometimes by type of enterprise ownership.

Guangdong's yearbook is surprisingly lacking in export information. Only the structure of industrial output was reported, with a figure of 32 percent as the share of industrial output that is exported.

Seven provinces reported industrial exports by type of enterprise. Of these, the share of industrial exports produced by state enterprises ranged from a high of 67 percent in Anhui to a low of 37 percent in Hainan. In addition to Anhui, state exports were above 50 percent of the total in Beijing, Shanxi, Fujian, and Hubei. Inner

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[16]The Chinese press refers to all of Hainan as a special economic zone. The customs data, however, distinguish between the zone and the province with slightly different numbers. With the data on exports from foreign invested firms, however, the figure for the province is exactly the same as for the whole province. This could imply that not all of the exports are accounted for in terms of location within the province, and hence does not add to the total, or that there are some exports from non-foreign invested firms that are considered to be from outside the zone.

Table 10. International Exports From Special Economic Areas, First Six Months, 1993

Type of Special Economic Area	Exports (million $US)
Special economic zones (SEZ)	5,796.63
Economic & technical development areas	949.72
High & new technological & industrial development areas	26.14
Bonded areas	60.30
Total	6,832.79
Percent of exports originating in special economic zones that are from foreign invested firms	
Shenzhen	57.9
Zhuhai	65.8
Shantou	23.9
Hainan	19.8
Xiamen	44.1
Average	42.0
Percent of China's total exports originating in special areas	18.4
Percent of provincial exports originating in special areas:	
Guangdong	27.1
Fujian	35.9
Hainan	96.2

Source: China Customs Statistics Monthly, no.6 (1993), pp.16-21.

Table 11. Individual Province and Major City Profiles

BEIJING	1990	
Industrial exports	Million yuan	Percent
Total	5,062.69	
State	2,890.95	57.1
'(of which, central)	162.57	
'(of which, local)	2,728.38	
Collective	1,559.68	30.8
'(of which, town)	739.31	
'(of which, township)	60.27	
Other	172.07	3.4
Total		100.0
Light industry	3,780.11	74.7
Heavy industry	1,282.59	25.3

Note: Beijing Statistical Yearbook, 1992, pp.210-213. Figures reported in 1990 comparable prices. Total of state, collective and other does not sum to reported total. The reported total was used to calculate the percentages.

TIANJIN	1990	
Direct industrial exports	Million yuan	Percent
Total	7,039.75	100.0
Light industry	5,329.26	75.7
Heavy industry	1,710.49	24.3

Note: In 1990 comparable prices; Tianjin Statistical Yearbook, 1991, p.348. Industrial production figures available by ownership, but not exports.

SHANXI	1990	
Industrial products supplied for export	Million yuan	Percent
Total	1,886.36	100.0
State	1,040.69	55.2
Collective	185.21	9.8
Other	660.46	35.0
Light industry	589.16	31.2
Heavy industry	1,297.20	68.8

Note: Shanxi Statistical Yearbook, 1991, p.525.

Table 11. Individual Province and Major City Profiles (continued)

INNER MONGOLIA

Revenue earned from industrial exports	1990 Million yuan	Percent
Total	501.952	100.0
State	447.688	89.2
Collective	.562	.1
Other	53.702	10.7
Light industry	280.646	55.9
Heavy industry	221.306	44.1

Note: Inner Mongolia Statistical Yearbook, 1991, pp.368-369. Industrial production by ownership reported.

SHANGHAI

Industrial exports from "sanzi" enterprises	1990 Million yuan	Percent
Total	1,811.68	100.0
State joint ventures	165.22	9.1
Collective joint ventures	507.11	28.0
Foreign owned	1,139.35	62.9
Total exports	Billion US$	
Total	5.740	100.0
Light industry and textiles	3.451	60.1
Heavy industry	1.561	27.2
Agriculture and sidelines	.728	12.7

Note: "Sanzi" exports are from Shanghai Statistical Yearbook, 1991, p. 175. These figures are available between 1987 and 1990. Total exports are from Shanghai Statistical Yearbook, 1992, p. 348. Total exports are reported for 1952-1991.

Table 11. Individual Province and Major City Profiles (continued)

JIANGSU Total exports	1990 Million US$	Percent
Total	2,949.95	100.0
Light industry	2,048.47	69.4
Heavy industry	684.33	23.2
Agriculture and sidelines	217.15	7.4

Note: Jiangsu Statistical Yearbook, 1992, p.265. Figures are reported for 1981-1991.

ZHEJIANG Industrial exports	1990 Million yuan	Percent
Total	17,635.96	100.0
State	6,764.22	38.4
Collective	9,438.58	53.5
'(of which, township)	3,865.09	21.9
Other	1,433.16	8.1
Light industry	14,476.81	82.1
Heavy industry	3,159.15	17.9

Total exports	Million US$	Percent
Total	2,259.34	100.0
Light industry	305.71	13.5
Heavy industry	1,645.94	72.9
Agriculture and sidelines	307.69	13.6

Note: Industrial export figures are reported in comparable 1990 prices. Industrial exports are from Zhejiang Statistical Yearbook, 1992, p.152. These figures are reported for 1988-1991. Total exports are from p.296. These figures are reported for 1985-1991.

Table 11. Individual Province and Major City Profiles (continued)

ANHUI Industrial exports	1991 Million yuan	Percent
Total	3,720.29	100.0
State	2,483.13	66.7
(of which, central)	215.63	5.8
(of which, local)	2,267.50	60.9
Collective	1,174.03	31.6
'(of which, town)	76.40	2.1
'(of which, township)	334.76	9.0
Other	63.13	1.7
Light industry	2,878.07	77.4
Heavy industry	842.22	22.6

Note: Anhui Statistical Yearbook, 1992, p.159. Figures are reported in 1990 comparable prices. Figures by ownership in more detail, and by product, are available for 1991.

FUJIAN Industrial exports	1990 Million yuan	Percent
Total	11,126.53	100.0
State	7,042.81	63.3
'(of which, central)	822.51	7.4
'(of which, local)	6,220.30	55.9
Collective	2,235.71	20.1
'(of which, town)	262.94	2.4
'(of which, township)	891.08	8.0
Other	1,848.01	16.6
'(of which, "sanzi")	1,764.40	15.9
Total exports		
Total		100.0
Light industry		72.3
Industry and mining		16.7
Agricultural and sidelines		11.0

Note: Fujian Statistical Yearbook, 1991; industrial exports, p.156; total exports, p.310 (absolute figures not reported). Industrial exports were reported in current 1990 prices. Production by ownership and exports product also reported for 1990.

Table 11. Individual Province and Major City Profiles (continued)

JIANGXI

Industrial exports of new products	1991 Million yuan	Percent
Total	268.909	100.0
State	266.509	99.1
Collective	2.400	.9
Light industry	188.356	70.0
Heavy industry	80.553	30.0

Note: Jiangxi Statistical Yearbook, 1992, p.512. Reported in current prices. Exports by product category also reported.

HUBEI

Industrial exports	1990 Million yuan	Percent
Total	3,812	100.0
State	2,686	70.5
Collective	1,122	29.4
Other	4	.1
Light industry	3,087	81.0
Heavy industry	725	19.0

Note: Hubei Statistical Yearbook, 1991, p.303. Exports by products, and for 1989 also reported.

GUANGDONG

	1991 Million yuan	Percent
Industrial exports	65,540	31.6

Note: Guangdong Statistical Yearbook, 1992, p.185. Export data by ownership not reported. Figures for 1985 and 1990 (except exports) also reported.

Table 11. Individual Province and Major City Profiles (continued)

HAINAN

Industrial exports	1991 Million yuan	1991 Percent
Total	351.27	100.0
State	130.99	37.3
Collective	4.63	1.3
Other	215.65	61.4
'(of which, "sanzi")	197.57	56.2
Light industry	273.34	77.8
Heavy industry	77.93	22.2

Note: Hainan Statistical Yearbook, 1992, p.263. Reported here in 1990 comparable prices. Reported also in current prices.

SICHUAN

Exports from large and medium enterprises	1991 Million yuan	1991 Percent
Total	6,196.10	100.0
Light industry	3,350.64	54.1
Heavy industry	2,845.46	45.9

Note: Sichuan Statistical Yearbook, 1992, p.153. The calculated total was less than reported total; the calculated total was used here. Exports by product, and production figures, also reported.

NOTE: The yearbooks, and other sources, were checked for similar information on the other provinces, but none was found. The descriptions of data given in this table are as given in the individual yearbooks.

Mongolia also reported that 89 percent of the revenue earned from industrial exports came from production in state owned enterprises. At the other end of the spectrum, in Zhejiang over 50 percent of industrial exports were produced by collective enterprises.

Twelve provinces reported exports broken down by light and heavy industry. Light industrial exports represented over 60 percent of the total in Beijing, Tianjin, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Hubei, and Hainan. They represented less than 60 percent in Shanxi, Inner Mongolia, and Sichuan. Light industrial exports ranged from a high of 82 percent in Zhejiang to a low of 31 percent in Shanxi.

Summary

Within the location profile, the importance of Guangdong to China's exports stands out. The three SEZs play a role in Guangdong but supply less than one third of the province's exports. In addition, the province's export growth has continued to rise, as has its contribution to China's total exports. This has occurred even while most other provinces were promoting their own exports and successfully increasing them annually.

The disaggregated data by individual province and city are broadly consistent with the observations made based on the full cross-provincial data. Although not a complete set, the areas that stand out in terms of light industrial exports are Zhejiang (82 percent), Hubei (81 percent), Anhui (77 percent), Tianjin (76 percent), Fujian (72 percent), Jiangsu (69 percent), and Shanghai (60 percent). The area that stands out in terms of collective exports is Zhejiang (54 percent). And the areas that stand out in terms of the category of "other", which originate largely in foreign invested firms, are Hainan (61 percent) and Shanxi (35 percent).

FUTURE EXPORT POTENTIAL

China's success with promoting its exports in recent years raises the question of what factors have contributed to this success and whether it will continue. This section addresses these issues by analyzing the available disaggregated export data in more depth. A number of correlations are performed to gauge what variables might be particularly important in explaining China's export growth. Then the identified key variables in China's past performance are assessed for possible future export performance. This analysis is based on variations across provinces.

Correlations of Key Variables

The results of the first part of this study suggest that there are several factors that appear to be related to exports. Foreign investment is one. Another is the connection between the share of collectives in a province's output and exports of light industrial products. Also, in terms of ownership, it was suggested that perhaps as much as 40 percent of exports were from non-state enterprises. This raises the

possibility that much of the growth in exports in recent years may have come from non-state enterprises. Further, it was suggested that in some areas where foreign investment has been low, collectives may be acting as a substitute for the flexibility that foreign investment affords an enterprise.

These and related ideas are explored further with the correlations presented in table 12. A full causation model explaining China's exports is beyond the scope of this study. Using simple correlations, however, we can see if there is any basis for these hypothesized relationships.

The first part of table 12 reports correlation coefficients between direct foreign investment (DFI90) and five export variables. Foreign investment is correlated with China's exports by all the measures included.[17] These results show that provinces with higher shares of foreign investment are also the provinces with higher shares of China's total exports (PRTOEX89). Not surprisingly, foreign investment is also correlated with the provincial share of exports from foreign invested firms (PRFOEX89), and with exports from foreign invested firms as a share of total exports (FOREX93). Foreign investment is also correlated with exports as a percent of GDP (EXGDP89). All of these results suggest that foreign investment has generated exports. Finally, there is a significant, albeit weaker, correlation between foreign investment and the size of provincial economies (PRGDP89). Provinces with larger economies, measured by their share in total GDP, tend to have larger shares of total foreign investment.

The second group of correlations in table 12 deal with the possible connections between collective ownership and exports.[18] This part of the table first indicates that there is a large, negative relationship between provinces with state enterprises (STATE) and those with collectives (COLL), at least with respect to production of gross industrial output value. There was almost no correlation between collectives and either individual (INDIV) or other enterprises (OTHER). These results suggest that provinces where state industrial production is important, collective production is relatively small, and vice versa.

With respect to exports, the relative importance of collectives was positively related to the share of light industrial exports (LTEXP), but not to exports generally (PRTOEX89) or to the share of exports in GDP (PRGDP89). This supports the hypothesis that collectives tend to produce, and export, light industrial goods. With respect to the size of provincial economies, collective production was correlated with provincial shares of China's GDP. In other words, collectives were relatively more important in provinces with larger economies.

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[17]Table 12 reports the results using 1990 direct foreign investment data, but the results were similar when the 1991 data were used as a check.

[18]Because comparable data on exports and production from town and township enterprises were not complete, these enterprises could not be analyzed separately from collectives in the correlation analysis.

Table 12. Correlation Coefficients Between Export Variables (all variables measured in percentages)

VARIABLE		
DFI90	**Provincial Share of Total Foreign investment (1990)**	
	CORRELATED WITH:	
PRTOEX89	Provincial share of total exports (1989)	.8324**
PRFOEX93	Share of total exports from foreign invested firms (1993)	.6233**
FOREXP93	Exports from foreign invested firms as a percent of total provincial exports (1993)	.9798**
EXGDP89	Exports as a percent of gross domestic product (GDP) (1989)	.5821**
PRGDP89	Provincial share of total GDP (1989)	.4956*
COLL	**Provincial Share of Gross Value of Industrial Output (GVIO) Produced by Collective Enterprises (1991)**	
	CORRELATED WITH:	
STATE	Share of GVIO produced by state enterprises (1991)	-.9089**
INDIV	Share of GVIO produced by individual enterprises (1991)	.2969
OTHER	Share of GVIO produced by other enterprises (1991)	.0226
LTEXP	Share of light industrial goods in total exports (1990)	.5684*
PRTOEX89	Provincial share of total exports (1989)	.3455
EXGDP89	Exports as a share of provincial GDP (1989)	.1139
PRGDP89	Provincial share of China's GDP (1989)	.7152**
STATE	**Provincial Share of GVIO Produced by State-owned Enterprises (1991)**	
	CORRELATED WITH:	
INDIV	Share of GVIO produced by individual enterprises (1991)	-.3273
OTHER	Share of GVIO produced by other enterprises (1991)	-.3960
LTEXP	Share of total light industrial exports (1990)	-.7376**
PRTOEX89	Provincial share of total exports (1989)	-.5479*
EXGDP89	Exports as a share of GDP (1989)	-.3597
PRGDP89	Provincial share of GDP (1989)	-.7497**

Table 12. Correlation Coefficients Between Export Variables (all variables measured in percentages) (continued)

VARIABLE		
PRTOEX89	**Provincial Share of Total Exports (1989)**	
	CORRELATED WITH:	
PRTOEX93	Provincial share of total exports (1993)	.8572**
OTHER	Share of GVIO produced by other enterprise (1991)	.6457**
PRGDP89	Provincial share of GDP (1989)	.7099**
DECENTRL	Share of GVIO produced by the non-state sector (1991)	.5479*
OPENDFI	Foreign investment (1990) as a percent of provincial GDP (1989)	.6160**

NOTE: The significance tests were two-tailed; an asterick (*) indicates significance at .01 level; two astericks (**) indicate significance at the .001 level. 1993 refers to first 6 months of 1993. See table A8 for sources.

In contrast, provinces with relatively more industrial output produced by state enterprises had significant negative correlations both with light industrial exports and total exports. Further, there was a significant, negative relationship between state produced output and the size of provincial economies. These results suggest that state enterprises have not been the engines of export growth.[19]

The last section of table 12 reports five correlations with the share of total exports. The first correlation is between total exports in 1989 (PRTOEX89) and in the first 6 months of 1993 by province (PRTOEX93). Because of data constraints, this study uses data series from different years to make inferences about a single time period. The highly significant correlation between exports in these two time periods lends credibility to this method. There was a significant, positive correlation between exports (PRTOEX89) and production from enterprises in the category of "other" (OTHER). This suggests that various types of foreign invested enterprises are important in this category.[20] Exports were also positively correlated with the relative size of provincial economies (PRGDP89).

Finally, two variables were constructed to proxy the degree of autonomy from higher levels of government and the degree of openness. The idea behind the decentralization measure (DECENTRL) is that areas with more autonomy have more flexibility to make economic decisions, and that these decisions would favor exports.[21] The decentralization measure is the contribution of non-state enterprises (collective, individual, and other) to total gross value of industrial output. As reported in table 12, this variable was positively correlated with total exports, and significant, lending support to the hypothesis that non-state production is compatible with export promotion.[22]

The degree of openness (OPENDFI) is measured as the ratio of foreign investment to provincial GDP. The expectation is that the more provinces are exposed

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[19]These results are consistent with conclusions drawn by Lardy (1992). He estimated that foreign invested firms and town and township enterprises together contributed almost half of the growth in exports over the 1980s (Lardy 1992, p.143 and note 30). He also emphasized the relatively poor performance of state enterprises.

[20]There was also a positive, significant correlation between foreign investment and "other," which supports the same conclusion.

[21]Lardy makes a strong case for this (1992, pp.39-41, 145-146).

[22]Note that this variable is simply the reverse of the variable labeled "state," as reflected in the fact that the correlation coefficient is the same only the opposite sign.

to international markets, the more important exports are likely to be. As reported in table 12, openness was significantly correlated with total exports.[23]

Since Guangdong is so important to China's foreign investment and exports, the results presented in table 12 may be determined largely by this one province. For example, Guangdong received over 40 percent of China's direct foreign investment in 1990 and 1991 (Table A7). To see if the relationships hold beyond Guangdong, the correlations were performed leaving Guangdong out. These results are reported in table 13. For the most part, the relationships that are significant in table 12 are also significant in table 13.

There are three interesting exceptions, however. First, without Guangdong, direct foreign investment (DFI90) is no longer significantly correlated with provincial share of total GDP (PRGDP89). In other words, there seems to be no relationship between the size of a province's economy and whether or not it has received foreign investment, outside of Guangdong.

Second, the provincial share of total exports (PRTOEX89) is no longer significantly correlated with the share of GVIO produced by other enterprises (OTHER). Since the category of "other" enterprises includes foreign invested firms, this result implies that the statistical connection between total exports and foreign investment was being determined primarily by Guangdong.

The third difference between the results in tables 12 and 13 is similar to the second. The relationship between the provincial share of total exports (PRTOEX89) and foreign investment as a percent of provincial GDP (OPENDFI) is not statistically significant if Guangdong is excluded. Again the implication here is that the presence of foreign investment, scaled by the size of provincial economies, is not statistically correlated with provincial shares in total exports. This implies that China's exports from provinces other than Guangdong may not be explained well by the presence of foreign investment.

Note, however, that in table 13 the provincial share of total exports (PRTOEX89) is still significantly correlated with the provincial share of total foreign investment (DFI90), although the coefficient is lower than when Guangdong is included in table 12. This result seems inconsistent with the relationship between PRTOEX89 and OPENDFI. Since the OPENDFI variable takes the size of provincial economies into account and is a closer approximation the foreign capital stock rather than the flow variable of DFI90, the fact that this correlation is insignificant is important to understanding the sources of exports throughout China. This result does not, however, negate the fact that foreign investment has helped fuel exports in Guangdong.

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[23]Openness was not significantly correlated with the decentralization measure, suggesting that these two variables may indeed be capturing different provincial characteristics.

Table 13. Correlation Coefficients Between Export Variables With Guangdong Excluded (all variables measured in percentages)

VARIABLE		
DFI90	**Provincial Share of Total Foreign investment (1990)**	
	CORRELATED WITH:	
PRTOEX89	Provincial share of total exports (1989)	.6607**
PRFOEX93	Share of total exports from foreign invested firms (1993)	.7878**
FOREXP93	Exports from foreign invested firms as a percent of total provincial exports (1993)	.7804**
EXGDP89	Exports as a percent of gross domestic product (GDP) (1989)	.6302**
PRGDP89	Provincial share of total GDP (1989)	.3277
COLL	**Provincial Share of Gross Value of Industrial Output (GVIO) Produced by Collective Enterprises (1991)**	
	CORRELATED WITH:	
STATE	Share of GVIO produced by state enterprises (1991)	-.9329**
INDIV	Share of GVIO produced by individual enterprises (1991)	.3016
OTHER	Share of GVIO produced by other enterprises (1991)	-.0250
LTEXP	Share of light industrial goods in total exports (1990)	.7860**
PRTOEX89	Provincial share of total exports (1989)	.4259
EXGDP89	Exports as a share of provincial GDP (1989)	.0913
PRGDP89	Provincial share of China's GDP (1989)	.7571**
STATE	**Provincial Share of GVIO Produced by State-owned Enterprises (1991)**	
	CORRELATED WITH:	
INDIV	Share of GVIO produced by individual enterprises (1991)	-.3593
OTHER	Share of GVIO produced by other enterprises (1991)	-.2833
LTEXP	Share of total light industrial exports (1990)	-.8152**
PRTOEX89	Provincial share of total exports (1989)	-.5000*
EXGDP89	Exports as a share of GDP (1989)	-.2674
PRGDP89	Provincial share of GDP (1989)	-.7197**

Table 13. Correlation Coefficients Between Export Variables, With Guangdong Excluded (all variables measured in percentages) (continued)

VARIABLE		
PRTOEX89	**Provincial Share of Total Exports (1989)**	
	CORRELATED WITH:	
PRTOEX93	Provincial share of total exports (1993)	.8601**
OTHER	Share of GVIO produced by other enterprises (1991)	.4003**
PRGDP89	Provincial share of total GDP (1989)	.6461**
DECENTRL	Share of GVIO produced by the non-state sector (1991)	.5000*
OPENDFI	Foreign investment (1990) as a percent of provincial GDP (1989)	.3474**

NOTE: The significance tests were two-tailed; an asterick (*) indicates significance at .01 level; two astericks (**) indicate significance at the .001 level. 1993 refers to first 6 months of 1993. See table A8 for sources.

Elements of Future Export Growth

The correlations identified some key factors related to China's past export profile. Although no attempt was made to establish causation, the correlation results were consistent with some common hypotheses concerning factors influencing exports.

Possibly the most important factor related to future exports will be foreign investment. In 1992 and early 1993, foreign investment increased dramatically. Contracted investment in 1992 was almost $69 billion compared with $20 billion in 1991, and utilized investment was $19 billion in 1992 compared with $12 billion in 1991 (China Statistical Yearbook, 1992, p.641, and FBIS-CHI-93-032, 19 February 1993, p.21). While these numbers are probably inflated, there is little doubt that foreign investment is flowing into China (McGregor 1992, p.A10; Goldstein 1992, pp.72-73). If Guangdong's experience is any indication, these increases can be expected to contribute substantially to China's future exports.

One factor that may dampen foreign investment's contribution to exports in the long term is the size of China's domestic market. As incomes grow and government control over domestic sales relaxes, exportable products are being diverted into the domestic market. Many foreign companies have stressed exports in the past out of necessity to earn foreign exchange to pay for imported inputs, and because Beijing required them to export a certain amount. With the swap foreign exchange centers, and with Beijing allowing localities to make more of the decisions concerning terms of investment, these reasons are no longer as compelling as in the past. Also, compared with the past, more of the new foreign investment is for services, most of which will not be exported. In the near term, however, the sheer size of new foreign investment, and the fact that previous investment will be coming on line, will fuel increases in China's exports.

In terms of location of foreign investment, a statistical accounting of where new capital is flowing is not yet available. Based on qualitative information it appears that Guangdong, Hainan, and Fujian will continue to receive a large portion of the new investment. It is expected that exports from these areas will continue to increase steadily. In addition, Shanghai and Jiangsu appear to be the new major winners in attracting foreign investment. The main reason for the increases in Shanghai is Pudong. Although it is unclear whether Chinese leaders have chosen a product group to promote through subsidies, it appears to have made a substantial regional commitment to promote investment and exports in Pudong. Nearby Jiangsu has had relatively little foreign investment in the past. Provincial and local authorities have decided to change this, and have been trying to attract foreign capital. The investment in these areas is likely to increase their exports at rates higher than the national average for some years to come. Jiangsu, in particular, is still not a major contributor to China's total exports, but this is likely to change. Fujian may receive a new inflow of investment from Taiwan, and from other countries via Taiwan. Taiwan is developing zones on its west coast for multinationals, positioning itself to

facilitate companies interested in doing business on the mainland (The Economist, 24 July 1993, pp.69-70).

The second major factor related to future exports that this study underscores is the importance of the non-state sector. Foreign investment alone does not explain China's impressive export growth, and the presence of state enterprises is negatively correlated with exports. In contrast, collective enterprises stand out as being correlated with light industrial exports. Within collective enterprises, town and township enterprises appear to be especially tied to international markets. According to some analysts, exports from these type of enterprises will continue to increase (Zweig 1992). It is also expected that the size of the non-state sector generally will continue to increase, and that its contribution to exports will increase as well.

Behind the relationship between exports and the non-state sector is a suggestion that more decentralized decision-making allows growth in exports. In the correlations, this was proxied with the DECENTRL variable measured as the share of gross value of industrial output produced by the non-state sector. This variable was significantly correlated with total exports by province. It is interesting to note that this variable seems to be capturing something different than decentralization due to foreign investment alone since the DECENTRL variable was not significantly correlated with foreign investment as a percent of GDP.

A third major factor, and one not introduced in the study so far, is the value of the Chinese currency. With growing access to foreign exchange swap markets, and a new tendency on the part of Beijing to let the currency float beyond previous bands, China's former foreign exchange constraint has been lessened. In late 1993 the Chinese leadership announced that China's currency would be allowed to float within a year (Ren 1993). Further, the currency has devalued substantially, making China's exports relatively inexpensive in the international market.

Summary

An analysis of China's export profile in the late 1980s and early 1990s reveals a few key factors to watch throughout the rest of the decade. Areas with growing foreign investment are expected to increase their exports more than the national average even though a growing share of production from foreign invested firms will find domestic markets within China. Shanghai and Jiangsu are expected to join Guangdong and Fujian as provinces where foreign investment will determine large shares of their exports.

Increases in exports from other areas in China will be largely determined by growth in the non-state sector generally. This conclusion is based on the fact that in the past light industrial exports have been related to the presence of collective enterprises, and that the presence of non-state industrial enterprises has been related to overall exports. In addition, the presence of state enterprises has been negatively related to both light industrial exports and to export performance overall.

CONCLUSION

Both the disaggregated data presented in the first part of this study, and the correlations of variables believed to be related to exports in the second part, substantiate the importance of foreign investment and collective enterprises, especially town and township collectives, to China's export production. Taken together, these enterprises represent most of the non-state sector. Information on exports from private and individual enterprises is lacking, but they are believed to be insignificant at this time.

Exports from state-owned enterprises are still important. However, export growth from this sector has been weak, and the state share in total exports has fallen considerably over the decade of the 1980s. Preliminary estimates presented in this study suggest exports from state-owned enterprises may represent 60 percent or less of China's exports by the early 1990s.

It is important to note, however, that state enterprises are extremely important in certain geographic areas, earning the majority of foreign exchange available to them. This is especially true for the poorer provinces of the west, and much of the north, including Inner Mongolia, Heilongjiang, and Jilin.

The correlations presented showed a significant, negative relationship between provincial exports and the relative importance of state-owned enterprises. Based on this information, however, we cannot say what is behind this negative correlation. For example, it could be due to inefficiencies within enterprises making their products non-competitive; to these enterprises being stifled by government bureaucracy and restrictive rules; to more state enterprises being in inaccessible locations; or to more state enterprises being in areas with poor conditions for exports, such as infrastructure, expertise, etc. The causality, and relative importance of different factors, requires further research.

In terms of the product profile, light industrial exports were positively correlated with the relative importance of collective production. This evidence is indirect. The available data on exports from town and township enterprises, however, was broken down by location and by product. The importance of light industry--both narrowly and broadly defined--was explicit in these types of collective enterprises.

The significant contributions of certain provinces to China's exports were reflected in many of the variables examined. In most cases, Guangdong was first. In addition, Guangdong's importance has increased over time, despite export growth throughout China. Guangdong accounted for 61 percent of the exports from foreign firms in early 1993. This is not surprising since it has been the largest recipient of foreign investment. The province's export success, however, goes beyond the presence of foreign investment and special economic zones. Exports are produced by all types of enterprises throughout the province.

One of the hypotheses suggested by this study is that export production is related to the degree of flexibility managers have to make decisions concerning products, pricing, inputs, etc. The study attempts to capture this with two variables that proxy decentralization and openness. These variables were highly correlated with the export variables. Lardy (1992, p.127) argues that it has been these types of factors that explain Guangdong's success, rather than location and foreign investment. Again, formal measures of the relative importance of these factors require further research. The results of this study suggest, however, that relatively more export production is found in areas with foreign investment, special areas, town and township enterprises, and liberal policies. All of these factors can be tied to decentralization and openness.

In the last quarter of 1992, and the first half of 1993, China experienced trade deficits. These deficits are primarily due to rapid increases in imports, rather than to sluggish exports. In the next several years, China's exports are expected to continue to grow at healthy rates. The major reasons are increased foreign investment, increased importance of the non-state sector generally, and devaluation of the Chinese currency.

APPENDIX

Table A1. International Exports From Town and Township Enterprises By Province, 1989
(In current Chinese yuan)

Province	Total provincial exports	Exports from town/township enterprises: Direct exports	Exports from town/township enterprises: Indirect exports	Town and township exports, direct and indirect: Percent of provincial exports	Town and township exports, direct and indirect: Percent of China's exports
Beijing	4,363,437,705	735,520,000	346,230,000	24.79	.55
Tianjin	6,333,609,260	1,541,220,000	501,730,000	32.26	1.04
Hebei	6,151,005,795	875,620,000	528,670,000	22.83	.71
Shanxi	1,502,637,565	235,380,000	138,590,000	24.89	.19
Inner Mongolia	1,263,310,950	27,270,000	24,020,000	4.06	.03
Liaoning	16,700,309,615	1,383,780,000	382,810,000	10.58	.90
Jilin	2,571,211,555	88,010,000	35,370,000	4.80	.06
Heilongjiang	3,859,127,580	141,100,000	51,800,000	5.00	.10
Shanghai	18,904,285,730	3,208,680,000	1,494,100,000	24.88	2.38
Jiangsu	9,170,029,715	5,902,160,000	1,955,110,000	85.68	3.98
Zhejiang	7,059,177,235	3,261,390,000	1,201,550,000	63.22	2.26
Anhui	1,969,833,470	170,370,000	100,340,000	13.74	.14
Fujian	6,242,213,615	1,755,450,000	N/A	28.12	.89
Jiangxi	1,937,527,570	175,520,000	100,890,000	14.27	.14
Shandong	11,463,598,355	2,361,950,000	1,016,540,000	29.47	1.71
Henan	3,076,460,805	409,940,000	337,530,000	24.30	.38
Hubei	3,859,766,185	410,390,000	278,550,000	17.85	.35
Hunan	2,500,439,095	478,920,000	227,640,000	28.26	.36
Guangdong	30,681,852,355	3,007,450,000	874,000,000	12.65	1.97
Guangxi	2,194,922,950	162,080,000	54,030,000	9.85	.11
Hainan	1,355,420,330	5,010,000	140,000	N/A	.00
Sichuan	3,565,557,105	583,910,000	166,260,000	21.04	.38
Guizhou	495,895,565	43,430,000	37,370,000	16.29	.04
Yunnan	1,406,508,730	79,660,000	30,750,000	7.85	.06
Tibet	N/A	N/A	N/A	N/A	.00
Shaanxi	1,437,725,245	50,610,000	16,720,000	4.68	.03
Gansu	576,171,970	30,060,000	29,860,000	10.40	.03
Qinghai	N/A	9,390,000	36,720,000	N/A	.02
Ningxia	234,706,120	19,300,000	480,000	8.43	.01
Xinjiang	1,355,833,545	8,780,000	14,180,000	1.69	.01
Percent of China's exports					18.82

Notes: The provincial total and town/township enterprise trade figures are all compiled by MOFERT, the Ministry of Foreign Relations and Trade. The MOFERT figures are the sum of statistics reported by various enterprises. Total exports by province were reported in US dollars; we have converted these totals into yuan using the 1989 official exchange rate of US$1= 3.7565 yuan. Town/township enterprise exports were reported in yuan. "Direct" exports are purchased by state-owned import-export companies for sale on the international market. "Indirect" exports are sold abroad by other means, such as through arrangements made by joint ventures or wholly-owned foreign ventures with foreign buyers. MOFERT trade figures are not as high as Customs figures.

Sources: Guojia tongjiju. Quanguo gesheng, zizhiqu, zhixiashi lishi ziliao huibian, 1949-1989 [Compilation of Historical Data on Each Province, Autonomous Region and Independent Municipality in China, 1949-1989]. Beijing: Zhongguo tongji chubanshe, August, 1990. Chen Yaobang, Zhongguo xiangzhen qiye nianjian, 1978-1987 [Almanac of China's Town/township Enterprises, 1978-1987]. Beijing: Nongye chubanshe, December, 1989. 317-318, 616-623. Chen Yaobang, Zhongguo xiangzhen qiye nianjian, 1990 [Almanac of China's Town and township Enterprises, 1990]. Beijing: Nongye chubanshe, 1990, p.168.

Table A2. International Exports From Town and Township Enterprises By Province, 1987
(In current Chinese yuan)

Province	Total provincial exports	Exports from town/township enterprises			
		Town and township enterprises			
		Direct exports	Indirect exports	Percent of provincial exports	Percent of China's exports
Beijing	3,284,232,156	330,590,000	166,270,000	15.13	.34
Tianjin	5,646,872,352	789,630,000	N/A	13.98	.54
Hebei	5,526,387,975	352,240,000	418,380,000	13.94	.52
Shanxi	1,286,022,771	86,830,000	34,150,000	9.41	.08
Inner Mongolia	843,204,534	16,150,000	7,900,000	2.85	.02
Liaoning	14,099,314,800	442,970,000	157,050,000	4.26	.41
Jilin	1,740,677,286	39,260,000	7,140,000	2.67	.03
Heilongjiang	2,970,310,242	53,840,000	20,780,000	2.51	.05
Shanghai	15,482,744,928	1,526,630,000	663,880,000	14.15	1.49
Jiangsu	7,885,641,060	2,296,370,000	956,850,000	41.25	2.22
Zhejiang	5,100,319,188	1,019,460,000	628,530,000	32.31	1.12
Anhui	1,946,509,416	67,580,000	35,130,000	5.28	.07
Fujian	3,161,291,193	561,870,000	90,320,000	20.63	.44
Jiangxi	1,496,954,178	95,140,000	63,520,000	10.60	.11
Shandong	11,076,299,622	910,010,000	180,310,000	9.84	.74
Henan	2,435,518,914	157,710,000	98,090,000	10.50	.17
Hubei	3,554,419,395	211,370,000	66,850,000	7.83	.19
Hunan	2,305,654,845	251,470,000	120,510,000	16.13	.25
Guangdong	20,263,745,157	2,112,960,000	376,540,000	12.29	1.70
Guangxi	2,022,254,151	129,030,000	32,430,000	7.98	.11
Hainan	429,716,445	N/A	N/A	N/A	.00
Sichuan	2,718,249,630	297,230,000	115,360,000	15.18	.28
Guizhou	346,006,416	39,680,000	7,500,000	13.64	.03
Yunnan	976,157,946	35,670,000	24,540,000	6.17	.04
Tibet	N/A	N/A	N/A	N/A	.00
Shaanxi	989,408,622	30,080,000	6,670,000	3.71	.03
Gansu	471,217,860	21,550,000	8,540,000	6.39	.02
Qinghai	N/A	9,030,000	290,000	N/A	.01
Ningxia	234,864,510	12,520,000	3,010,000	6.61	.01
Xinjiang	829,693,311	5,800,000	2,560,000	1.01	.01
Percent of China's exports					11.03

Notes: The provincial total and town/township enterprise trade figures are all compiled by MOFERT, the Ministry of Foreign Relations and Trade. The MOFERT figures are the sum of statistics reported by various enterprises. Total exports by province were reported in U.S. dollars; we have converted these totals into yuan using the official exchange rate of US$1 = 3.7221 yuan. Town/township enterprise exports were reported in yuan. "Direct" exports are purchased by state-owned import-export companies for sale on the international market. "Indirect" exports are sold abroad by other means, such as through arrangements made by joint ventures or wholly-owned foreign ventures with foreign buyers. MOFERT trade figures are not as high as Customs figures.

Sources: Guojia tongjiju. Guanguo gesheng, zizhiqu, zhixiashi lishi ziliao huibian, 1949-1989 [Compilation of Historical Data on Each Province, Autonomous Region and Independent Municipality in China, 1949-1989]. Beijing: Zhongguo tongji chubanshe, August, 1990. Chen Yaobang, Zhongguo xiangzhen qiye nianjian, 1978-1987 [Almanac of China's Town and township Enterprises, 1978-1987]. Beijing: Nongye chubanshe, December, 1989. 317-318, 616-623.

Table A3. Machinery and Electronic Exports by Product: 1990

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Farm Machinery	Ministry of Machine-building and Electronic Industry	Tractor	unit	81,000	3,156
		Walking tractor	unit	9,556	9,582
		Rotocultivator	unit	4	2
		Blade for Plow and Harrow	piece	11,710,000	2,599
		Tiller			775
		Motorized sprayer	unit	1,630	152
		Hand sprayer	unit	30,800	200
		Argicultural pump & machine	unit	16,000	1,301
		Irrigation and drainage machinery	unit	150	70
		Other irrigation and drainage machinery	unit	1,041	155
		Thresher	unit	225	84
		Harvester	unit	40	19
		Farm construction machine	unit	235	397
		Land leveling machine	unit	5	262
		Parts of agricultural machine			15,800
	Dept. of Agriculture & Reclamation	Argicultural pump	unit	32	62
	Ministry of Agriculture	Cane knife	unit	135,000	117
		Parts of agricultural machine	unit	429,000	5,048
Internal Combustion Engine	China Petroleum and Gas Corporation	300k W generator	unit	2	117
Tropic Plant Machinery	Dept. of Agriculture & Reclamation	Initial processing machinery for rubber	unit	54	207
	Ministry of Agriculture	Processing machinery for sisal hemp	unit	10	24
Animal Husbandry Machinery	Ministry of Machine-building and Electronic Industry	Animal husbandry machinery	unit	1,225	77
		Feed processing machinery	unit	125	18
		Livestock and poultry feeding machine	unit	1,100	59
	Dept. of Agriculture & Reclamation	Live farm machinery of which:			
	Ministry of Agriculture	liquid nitrogen biological storage vessel	set	14	23
Forestry Machinery	Ministry of Forestry	Total	unit	293	746
		Forestry tractor	unit	134	690
		other main forestry machinery	unit	159	56

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990)		
			Exported products		Export amount (1,000 U.S. dollars)
			Units	Total	
Timber Industry Machinery	Ministry of Forestry	Total	unit	4,310	7,458
		Log felling & transporting mach.	unit	48	2,407
		Winch	unit	12	90
		Spring Panel			233
		Muffler	unit	8,393	19
		Cylinder	unit	609	12
		Wood-working machine tool	unit	1,721	3,720
		Wood-based panel equipment	unit	13	159
		Edges of forestry machinery	piece	1,123,000	330
		Parts of timber industry machinery			317
		Gasoline engine	unit	2,516	171
	Ministry of Machine-building and Electronic Industry	Wood-working machinery	unit	210	80
Metal cutting machine tools	Ministry of Machine-building and Electronic Industry	Lathe	unit	159,600	38,206
		Drilling machine	unit	64,800	7,853
		Boring machine	unit	1,575	1,680
		Grinder	unit	32,800	7,692
		Gear processing machine	unit	1,382	2,965
		Screw processing machine	unit	1,042	308
		Metalworking machinery			21,238
		Planing machine	unit	4,895	2,280
		Slotting machine	unit	708	624
		Electric processor	unit	11	575
		NC machine tool	unit	1,207	3,400
		Meter machine	unit	1	1
		Other machineries	unit	218,200	17,156
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Vertical drilling machine	unit	479	331
Forging and Pressing machinery	Ministry of Machine-building and Electronic Industry	Mechanical press	unit	27,700	8,338
		Forging and pressing equipment	unit	942	590
		Automatic press	unit	15	19
		Forging hammer	unit	25	55
		Shering machine	unit	428	1,407
		Shaping machine	unit	11	59
		Other forging and pressing equipment	unit	2,011	1,182
Foundry machinery measuring tools and cutting tools	Ministry of Machine-building and Electronic Industry	Measuring tools	unit	26,851,600	8,103
		Cutting tools	unit	8,651,750,000	33,511

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Abrasives and grinding tools	Ministry of Machine-building and Electronic Industry	Oilstone	piece	4,612,900	895
		Grindstone	piece	1,943,400	881
		Abrasive wheel	piece	10,818,000	1,410
		Other grinding tools	piece	1,563,900	1,290
		Grinding tools			27,767
	China Nuclear Industry Corporation	Artificial diamond	gram	284,568	695
		Artificial diamond drill bit	piece	20	2
		Artificial reaming bit	unit	260	18
	Ministry of Machine-building and Electronic Industry	Abrasive wheel frame	unit	48,000	111
General machinery	Ministry of Machine-building and Electronic Industry	Total			89,826
		Industrial pumps	unit	626,900	743
		High vacuum pump	unit	41,000	395
		Pressure testing pump	unit	56,400	1,131
		Hand pump	unit	11,400	123
		Other pumps	unit	144,500	2,767
		Fans	unit	26,000	1,074
		Air compressor	unit	1,589	663
		Small air compressor	unit	1,618	665
		Aeroseparator	unit	1,430	616
		Valves	unit	16,656,100	7,888
		High & medium pressure valves	unit	2,280,000	7,324
		Other valves	unit	632,300	1,403
		Flange plate	unit	193,000	6,254
		Parts for general machinery			12,546
		Other general machinery			17,560
	Ministry of Energy Industry	Valves, electric drive	unit	82	32
	Ministry of Metallurgical Industry	Valves	ton	63	65
General components for machinery	Ministry of Machine-building and Electronic Industry	Industrial chains	meter	357,440,800	11,089
		Standard fastener			14,223
		Rubber seals			449
		Powder metallurgical products		187	241
		Engineering hydraulic components and other attachments		11,500	18
	Ministry of Metallurgical Industry	Tube joint	ton	135,000	63

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
	Dept. of Agriculture & Reclamation Ministry of Agriculture	standard components	piece	20,000,000	58
		chains	meter	26,000	122
Bearing	Ministry of Machine-building and Electronic Industry	Bearing			63,568
		Miniature bearing	set	2,940,000	1,481
		Powder metallurgical bearing	set	17,100	8
		Industrial steel balls	each	1,823,128,800	1,322
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Bearing	set	535,000	205
Cranes and Handling Equipment	Ministry of Machine-building and Electronic Industry	Motor-driven double beam overhead crane	unit	18	41
		Motor-driven single beam overhead crane	unit	54,000	1,747
		Electrically-operated single rail crane	unit	561,200	6,150
		Hand-operated double beam crane	unit	1	73
		Hand-operated single rail hoist	unit	1,477	65
		Tyre crane	unit	2	301
		Automobile crane	unit	3,341	3,978
		Caterpillar crane	unit	6	359
		Tower crane	unit	7	561
		Portal hoisting machine	unit	2	1,442
		Hoisting machine			5,611
		Electrically-driven hoist	unit	14,100	675
		Hand-operated hoist	unit	470,400	8,740
		Jack	unit	9,967,100	13,523
		Other hoisting machine	unit	24,800	1,407
		Linked chains	ton	2,108,000	6,143
		Hand-operated transporting carts	each	9,904	1,159
	Ministry of Transportation	Material rolling, casting platform car	each	20	219
		Movable parking lots	batch	4	363
	Ministry of Metallurgical Industry	Forklift truck and forklift for goods	ton	123	177
		Jack	ton	200	78

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Geological Prospecting Equipment	Ministry of Geology and Minerals	Geological prospecting drill	unit	4	142
		Slurry pump	unit	14	47
		Diesel Engine	unit	504	808
		Diesel engine water pump machine set	set	40	82
		Rock drill, hammer drill	piece	44,295	1,141
		Jack	unit	3,200	79
		Drill	each	457	50
		Artificial diamond and products	piece	100	2
		Natural diamond	carat	10,020	34
		Laboratorial ore-seperating equipment	unit	5	4
		Others			160
	China National Nonferrous Metal Industry Corp.	Artificial diamond and reamer	each	600	71
	Bureau of Electrical Machinery, Ministry of Energy	Geological prospecting drill	unit	12	65
	China Petroleum and Gas Corporation	Seismic drill	unit	15	1,175
Mining and Colliery Machinery	Ministry of Machine-building and Electronic Industry	Bulldozer	unit	9,816	612
		Loading and transporting machine	unit	266	2,023
		Pneumatic tools	unit	2,626	229
		Parts for heavy industrial mining machinery			6,788
		Grinding equipment	unit	210	245
		Rock drill	unit	5,964	376
		Crush equipment	unit	8,082	3,747
		Hand-operated hoist	unit	8,765	217
	China Colliery Machinery and Equipment Corporation	Total			930
		Drag flight conveyor	unit	7	51
		Belt conveyor	unit	18	123
		Single hydraulic prop	piece	335	153
		Special equipment for coal mine (cages)	ton	162	136
		Mine-use lighting and component	each	2,100	42
		Gear pump	unit	200	15
		Chains	strip	24,451	410
	Bureau of Electrical Machinery, Ministry of Energy	Mine-use superimposed trailer	each	8	149
		Heat-propelled seamless bend	piece/ton	21486/77	90

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
	China National Nonferrous Metal Industry Corp.	Drilling tools	piece	35,000	700
		Drilling tools and diamond products			340
		Coal mine spare components			1,600
	Ministry of Metallurgical Industry	Mine-use rotary drill	piece	50	98
		Drilled and crushed mining debris	unit/ton	54/148	114
		Coal mine spare components	ton	118	114
Heavy Machinery	Ministry of Metallurgical Industry	Rolls	ton	220	990
		Ingot mold	ton	17	40
		Manganese steel tools			345
		Heat converter	piece/ton	2/38	35
		Spare parts for heating furnace	ton	91	175
		Spare parts for electric furnace	set/ton	10/63	10
		Metallurgical blades	ton	17	100
		Flange plate	ton	130	133
		Forged balls	ton	1,071	392
		Other spare components for metallurgy			160
	China National Nonferrous Metal Industry Corp.	Ferroalloy furnace	unit	2	1,000
		Crystalizer and the spare component	unit	1	260
		Rolling machinery and the spare component			190
		Other heavy machinery			
		Equipment spare parts and consumtion parts			500
Petroleum and Chemical Equipment	Ministry of Chemical Industry	Chemical industrial equipement and chemical industrial machinery			11,130
	Ministry of Machine-building and Electronic Industry	Oil well pumping unit	unit	11,500	2,344
		Petroleum drill	each	57,100	1,281
		Petroleum machinery			144
		air steel vessel	each	56,200	1,783
	China Petroleum and Gas Corporation	Total			7,216
	China Petroleum and Chemical Corporation	Machinery components	ton	340	452

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Rubber and Plastics Machinery	Ministry of Chemical Industry	Rubber machinery			20,870
	Ministry of Light Industry	Injector			7,560
	Ministry of Machine-building and Electronic Industry	Plastics machinery	unit	3,090	5,661
Building Materials Machinery	State Bureau of Building Materials Industry	Total	ton	713	1,307
		Brick making machinery	ton	61	149
		Glass manufactory equipment	ton	45	151
		Components and spare parts	ton	607	1,008
	Ministry of Water Resources	Hot-air re-circulated glass annealing furnace	each	4	40
Construction Eng. Machinery	Ministry of Transportation	Road surface machinery and parts			2,000
	Bureau of Electrical Machinery, Ministry of Energy	Total			2,140
		Steel frame for boiler	ton	2,571	850
		Steel structure of the cord crane	unit	2	310
		Elevated cable machinery	unit	2	830
		SS9600 Hydraulic trailer	each	8	150
	Ministry of Water Resources	SPZ10 Rotor loading and transporting machinery	unit	1	1
		JZ350 mixer	unit	2	5
		Steel structure for thermal power	ton	3,360	2,328
		Towing road roller	unit	1	
		Walking vibrating road roller	unit	11	
	Ministry of Machine-building and Electronic Industry	Cement mixer	unit	293	422
		Vibrator	unit	32	23
		Other construction Eng. machinery			645

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Cereal and Oil Machinery	Ministry of Commerce	Machinery for rice milling, flour milling and oil pressing, etc.			15,000
	Ministry of Machine-building and Electronic Industry	Total			2,611
		Flour million machinery	unit	49	462
		Rice milling machinery	unit	3,137	487
		Combine rice machinery	unit	195	87
		Oil pressing machinery	unit	2,433	199
Textile Machinery	Ministry of Textile Industry	Total			128,837
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Cone and paper tube for chemical fibre	piece	13,620,000	5,840
Domestic Appliances	Ministry of Light Industry in charge (statistical standard of Ministry of Foreign Economic Relations and Trade	Total of bicyles			299,530
		Bicyles	each	8,924,800	239,790
		Bicyles parts			57,540
		Others			2,200
		Total of sewing machines			76,800
		Household sewing machine	unit	1,091,000	31,120
		Multi-functional sewing machine	unit	1,400	120
		Sewing machine head	each	646,800	17,130
		Industrial sewing machine	unit	123,500	14,710
		Needles for sewing machine	each	429,000,000	4,210
		Parts for sewing machine			5,270
		Total of watch and clock			299,310
		Alarm clock	each	8,465,700	19,180
		Wooden clock	each	217,800	2,170
		Quartz clock	each	1,868,900	5,390
		Mechnical watch	each	14,423,900	44,870
		Core of the mechnical watch	each	39,110,400	91,400
	Ministry of Machine-building and Electronic Industry	Electronic watch	each	67,592,000	70,290
		Core of the electronic watch	each	19,809,600	15,960
		Parts of watch and clock			25,770
		Bicyles	unit	703,478	2,710
		Parts of bicyles			16
		Crank for the chains	set	14,000	18
		Bells	dozen	2,000	3
		Tyre pump	each	54,620	86
		Other parts for bicyles			648
		Household sewing machine	unit	44,673	744
		Industrial sewing machine	unit	98,350	345
		Other sewing machine			226

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990)		
			Exported products		Export amount (1,000 U.S. dollars)
			Units	Total	
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Lock for bicycles	each	824,000	317
		Head lights for bicycles	each	1,070,000	2,440
		Bicycle tyre pump	each	1,557,000	1,507
Electric Household Appliance	Ministry of Light Industry in charge (statistical standard of Ministry of Foreign Economic Relations and Trade	Total			357,150
		Refrigerator	unit	386,500	57,180
		Washing machine	unit	293,000	21,900
		Fans	unit	15,276,000	210,590
		Ceiling fans	unit	8,851,700	119,570
		Exhaust fans	unit	313,400	2,900
		Parts for fans			3,870
		Air conditioner	unit	15,400	5,110
		Vacuum cleaner	unit	134,200	1,290
		Electric rice cooker	unit	610,300	7,720
		Electric stove	unit	271,500	2,970
		Electric hot water heater	unit	60,800	1,750
		Eelctric roaster	unit	73,300	510
		Electric hair blower	unit	4,424,800	14,890
		Electric shaver	unit	169,700	680
		Electric hair curlor	dozen	1,129,400	9,480
		Electric iron	unit	2,482,800	11,950
		Eletric toaster	unit	88,100	770
	Ministry of Machine-building and Electronic Industry	Electric fans	unit	18,729,300	25,481
		Ceiling fans	unit	23,585,900	17,558
		Exhaust fans	unit	10,731,700	1,030
		Air cooler and heater	unit	10,500	10
		Refrigerator	unit	57,300	15,236
		Washing machine	unit	1,751,300	3,717
		Air conditioner	unit	104,500	1,783
		Vacuum cleaner	unit	1,100	25
		Electric stove	unit	1,609,800	848
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Refrigerator	unit	20,094	6,196
Printing Machinery	Ministry of Machine-building and Electronic Industry	Printing machine	unit	6,464	11,072
		Binding machine	unit	13,700	2,260
		Parts of printing machine			4,470
		Printing machinery			1,282
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Printing machine	unit	29	41
		Paper cutter	unit	61	101

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990)		
			Exported products		Export amount (1,000 U.S. dollars)
			Units	Total	
Medical Instrument	Ministry of Machine-building and Electronic Industry	Medical apparatus and instruments			6
Water Conservancy Machinery	Ministry of Water Resources	AS11 Spiral cylinder under-water silt cleaner	unit	1	12
		Sprinkler head	unit	8,520	46
	Bureau of Electrical Machinery, Ministry of Energy	Gate for water control project	ton	78	170
		Lifting winches for water resources	unit	2	180
Environmental Protection Machinery	Bureau of Electrical Machinery, Ministry of Energy	Fine opening silencer	unit	9	50
		Electrostatic precipitator	unit/ton	5/4336	1,330
Fire Fighting Equipment	Ministry of Public Security	Fire trucks	each	1	165
		Mechanical fire pump	unit	80	72
		Foam extinguisher	each	200,000	1,260
		Fire hose	meter	480,000	700
Railway Locomotive and Stock	China Railway Locomotive and Stock Corporation	Steam locomotive, internal combustion locomotive, freight wagon and spare parts			80,000
	Ministry of Machine-building and Electronic Industry	Railway cars and equipment			2,676
Automobile	Ministry of Machine-building and Electronic Industry	Tip truck	each	88	1,074
		Sedan	each	410	7,234
		Truck	each	220	4,394
		Agricultural transporting vehicle	each	445	533
		Jeep	each	1,038	9,738
		Motorcycle	each	20,800	1,720
		Component and part of automobile			104,798
		Other kinds of vehicle			53,960
		Other means of transportation			158
	Ministry of Transportation	Highway coach bus	each	36	1,080
		JP series superimposed container trailer	each	235	700

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
	Ministry of Construction	City bus	each	50	
	Bureau of Electrical Machinery, Ministry of Energy	Automobile	unit	2	310
	China National Nonferrous Metal Industry Corp.	Spare parts for automobile			50
	Ministry of Metallurgical Industry	T20 connecting rod	ton	387	468
	Dept. of Agriculture & Reclamation Ministry of Agriculture	Component & part of automobile	piece	3,000,000	189
Ship	China	Ship and boats	each/ overall ton	20 343,050	185,090
	Ship-building Corporation	Ship repair			22,060
		Other macninery and electronic products			11,920
	Ministy of Machine-building and Electronic Industry	Marine diesel engine	hp.	29,876	934
Salvage & Diving Equipment*	Ministry of Transportation	Hand-operated lever air feed pump and underwater intercom	set	40	122
		Wet diving suit	set	142	153
		Insulating life-saving suit	piece	430	520
		Heavy diving equipment	set	80	297
		Diving headgear	each	40	80
Industrial Boilers	Ministy of Machine-building and Electronic Industry	Total	stm.ton	150	478

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Power Generating Equipment	Ministy of Machine-building and Electronic Industry	Diesel generator	1000kW	83,188	5,843
		Water turbo-generator set	1000kW	501	13,498
		Turbo-generator	1000kW	375	20,173
		Gas-turbine generator			280
		Other power generator			747
		Power station boiler	stm.ton	820	6,894
Electric Machinery	Ministry of Machine-building and Electronic Industry	General A.C. generator	1000kW	914,708	3,981
		General A.C. electric motor	1000kW	149,381,164	27,654
		D.C. electric motor	1000kW	584,620	66
		Submerged electric motor	unit	9,900	553
		Fractional hp. electric motor	unit	12,387,300	13,387
		Micromotor	unit	2,460,000	843
		Other power machinery	unit	8,994	367
High Tension Elec. power Equipment	Ministry of Machine-building and Electronic Industry	Small transformer	1000Kv.	462,578	499
		Induction voltage regulator and transmitter	1000Kv.	18,516	289
		High tension isolating switch	set	7,009	392
		Mutual inductor	unit	8,188	1,408
		High tension switch board	each	106	170
		High tension fuse	unit	220,000	9
	Bureau of Electrical Machinery, Ministry of Energy	Fittings of power transmission line	ton	12,421,900	1,647
		Iron tower	ton	15,648	10,415
	Ministry of Metallurgical Industry	Transformer	unit/ton	22/44	128
Elements of Electric Appliance	Ministry of Machine-building and Electronic Industry	Major components	piece	18,916,000	1,687
		General components	piece	187,700,000	5,706
Electric, electronic device and unit	Ministry of Machine-building and Electronic Industry	Electric and electronic device	unit	1,900	456
		Electric and electronic unit	1000kW	200	456
Electric wire and cable	Ministry of Machine-building and Electronic Industry	Aluminium twisted wire with steel core	ton	104,500	2,488
		Bare copper wire	ton	4,212	13,683
		Electromagnet wire	ton	68,127	14,929
		Wiring	km	12,695,000	9,065
		Lead wire of the electric welder	km	1,867	2,653
		Cable with paper insulation	km	9,171	6,639
		Cable with plastic insulation	km	236,100	4,463
		Other electric wire and cable	km	5,513	4,359

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990)		
			Exported products		Export amount (1,000 U.S. dollars)
			Units	Total	
Insulating materials	Ministry of Machine-building and Electronic Industry	Electric porcelain	ton	50,800	7,076
		Low tension elecric porcelain	ton	3,066,900	683
		Other electric porcelain	ton	136,700	1,122
		Insulating materials	ton	8,692	5,314
Battery	Ministry of Machine-building and Electronic Industry				
		Battery	1000KVA hr.	1,968,000	604
		Other batteries	1000KVA hr.	1,654,517	1,410
Electrical Alloy	The whole industry	Total			1,748
		Casting AlNiCo permanent magnet	ton	225	8
		Powder sintering AlNiCo permanent magnet	ton	136	12
		AiNiCo alloy powder	ton	208	4
		Type3 magnet steel	piece	1,200,000	238
		Type5 magnet steel	ton	4,800	86
		Type8 magnet steel	ton	1,120	37
		Rare-earth permanent magnet	piece	4,710,000	470
		NdFeB permanent magnet	ton	2,258	
		Signal glass	piece	5,014	26
		Electrothermal alloy	ton	110	489
		Hard alloy	ton	0	7
General Instrument and Meter	Ministry of Machine-building and Electronic Industry	Electrical engineering meter	each	218,400	374
		Electron instrument			90
		Microscope	each	4,968	7,548
		Optical instrument			2,284
		Materials testing machine	unit	4,668	425
		Flowmeter	unit	32,197,000	1,366
		Physical-chemical instrument			73
		Lab instrument			1,728
		Component analysing instrument	unit	12,000	689
		Other instrument and meter			1,365
Weighing Apparatus	Ministry of Light Industry	Weighing apparatus for daily usage	unit	233,000	3,240
Teaching Instrument and Equipment	State Educational Commission	Instrument for physics			2,684
		Glass instrument			
		Specimen			

Table A3. Machinery and Electronic Exports by Product: 1990 (continued)

Sector	Dept.	Name of product	Total Amount of Export (1990) Exported products Units	Total	Export amount (1,000 U.S. dollars)
Special Instrument and Meters	Ministry of Geology and Minerals	Lab analytical instrument	unit	1	12
		Geological compass	each	210	7
	China Coal Mining Machinery and Equipment Corporation	Well detecting and monitoring instrument			472
		Respirator and cutout			199
	Ministry of Energy	Level 1 & level 2 three-phase electric capacity meter	unit	3	2
		DD28 single-phase electric capacity meter	each	500	4
		Current meter	set	8	4
	China Petroleum and Gas Corporation	Detector	each	130,000	800
		Seism cable core 110	set	1	148
		Magnetic boots	each	190,000	40
		Outer casing	each	60,000	30
	Ministry of Metallurgical Industry	Metallurgical meter	ton	945	363
Special Equipment for Electronic Industry	Ministry of Machine-building and Electronic Industry	Total			8,504
Total					3,771,535

Source: China Machinery and Electronic Industries Yearbook, 1991, pp.III.256-264.

Table A4. Value of Industrial Products Exported by Township Enterprises in China, 1989
(Million current yuan)

Province	Chemical industry		Machinery		Minerals		Food industry		Local products		Livestock products		Textile industry	
	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	1.89	1.12	20.58	8.50	5.10	3.31	12.51	6.92	.97	N/A	8.58	6.06	109.63	97.69
Tianjin	169.69	151.29	168.09	143.01	89.30	72.31	114.47	107.04	27.27	27.26	51.45	33.78	165.79	144.05
Hebei	99.39	76.79	105.85	60.23	36.34	24.59	187.25	157.42	17.66	10.34	97.25	69.16	32.09	19.79
Shanxi	42.75	28.82	12.87	9.36	101.64	34.36	77.75	57.80	5.04	4.96	1.17	.42	1.16	1.16
Inner Mongolia	N/A	N/A	8.31	4.06	16.25	7.76	N/A	N/A	.79	.39	9.63	9.42	6.21	1.16
Liaoning	40.64	38.72	91.03	76.34	258.67	155.54	672.77	585.53	67.66	57.82	66.56	61.58	66.16	57.65
Jilin	19.67	19.40	11.09	6.97	9.31	6.82	33.82	20.60	.14	N/A	6.12	6.06	2.79	2.30
Heilongjiang	7.41	4.90	5.66	5.50	20.27	18.10	22.76	18.75	5.98	5.90	8.44	3.08	33.74	26.12
Shanghai	131.72	62.73	110.08	78.52	210.75	195.87	152.98	135.13	50.39	48.89	120.00	115.32	657.41	419.47
Jiangsu	783.79	659.92	460.56	386.21	59.32	58.10	287.98	246.07	22.97	19.93	191.37	169.04	2,549.10	1,804.82
Zhejiang	135.56	88.77	259.45	199.12	255.41	205.83	288.08	218.34	170.45	146.42	216.58	170.44	1,048.49	797.41
Anhui	6.05	5.20	11.40	3.61	3.74	1.86	51.91	46.22	22.19	10.65	28.67	13.83	35.75	20.50
Fujian	49.05	49.05	7.01	7.01	61.04	61.04	312.74	312.74	56.30	56.30	26.88	26.88	28.76	28.76
Jiangxi	13.85	10.61	.15	.15	40.38	8.88	64.89	45.57	18.39	10.20	3.69	2.23	17.76	13.12
Shandong	245.54	225.51	249.95	215.78	312.31	140.59	775.84	566.72	52.27	48.27	157.65	133.37	366.24	249.24
Henan	32.48	21.87	90.73	52.10	22.37	13.62	15.56	10.65	20.61	7.12	77.99	31.11	31.05	21.76
Hubei	54.83	15.42	19.13	11.03	10.26	3.74	24.40	19.84	15.37	5.37	27.58	20.22	162.73	98.11
Hunan	91.55	65.74	13.39	9.67	116.73	64.82	76.22	47.15	48.92	27.98	12.17	10.07	38.86	23.49
Guangdong	45.29	32.41	120.84	77.14	68.13	23.28	181.34	142.73	58.00	38.07	252.33	230.53	362.29	333.15
Guangxi	33.62	26.13	.02	.02	33.99	20.92	18.34	14.16	7.06	5.47	N/A	N/A	4.60	4.20
Hainan	.05	.05	N/A	N/A	.53	.39	.66	.66	.55	.55	N/A	N/A	N/A	N/A
Sichuan	38.53	26.24	11.29	3.32	8.81	8.78	89.41	69.11	4.11	3.76	91.83	54.88	388.47	318.26
Guizhou	2.12	.54	N/A	N/A	75.11	41.83	.53	N/A	N/A	N/A	1.56	.62	.08	.08
Yunnan	12.30	1.94	3.93	1.38	55.15	49.50	16.98	7.28	1.68	1.68	.78	N/A	N/A	N/A
Tibet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shaanxi	13.61	11.72	.42	.05	30.54	25.65	2.41	2.27	.63	.63	4.29	2.74	2.45	1.10
Gansu	1.18	1.18	N/A	N/A	5.68	5.68	6.18	5.81	4.74	4.18	8.72	3.28	.73	.73
Qinghai	.45	.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.50	1.40
Ningxia	.39	.39	.10	N/A	8.11	8.11	3.36	3.07	4.19	4.10	.03	.03	N/A	N/A
Xinjiang	2.16	2.16	N/A	N/A	N/A	N/A	.91	.31	.23	N/A	1.12	.71	.25	N/A
CITIES														
Chongqing	7.96	7.96	1.84	1.84	8.78	8.78	22.48	22.48	3.26	3.26	4.25	4.25	124.55	124.55
Xi'an	.54	.54	.05	.05	.17	.17	.40	.40	.63	.63	1.85	1.85	1.10	1.10
Wuhan	9.07	3.81	3.31	.55	N/A	N/A	7.38	5.79	1.53	1.53	17.88	12.06	8.91	2.79
Guangzhou	.29	.29	19.54	19.54	1.22	1.22	4.37	4.11	5.00	5.00	1.46	N/A	14.21	13.59
Shenyang	1.07	1.07	3.90	1.71	2.49	1.68	6.67	5.37	4.91	.69	2.03	1.94	.52	.52
Dalian	23.20	23.20	44.93	44.93	6.36	6.36	441.47	441.47	44.29	44.29	48.12	48.12	23.47	23.47
Herbin	N/A	N/A	.48	.32	1.00	1.00	N/A	N/A	N/A	N/A	1.60	1.60	N/A	N/A
Qingdao	81.60	79.69	108.20	91.24	249.40	86.26	129.60	93.62	N/A	N/A	13.21	.54	112.56	72.85
Nanjing	17.52	8.45	1.87	1.61	N/A	N/A	.18	.18	N/A	N/A	2.21	2.09	11.38	4.94
Ningbo	19.93	18.71	57.55	44.31	53.58	46.21	38.68	35.94	20.91	19.65	18.80	18.65	184.87	165.88
Chengdu	3.94	3.94	3.48	1.48	.03	N/A	1.67	1.42	N/A	N/A	59.72	29.82	N/A	N/A
Xiamen	1.56	1.56	N/A	N/A	5.22	5.22	25.91	25.91	11.59	11.59	N/A	N/A	N/A	N/A
Changchun	N/A	N/A	6.77	5.34	.05	.05	10.41	9.63	N/A	N/A	5.64	5.58	2.10	1.61

Table A4. Value of Industrial Products Exported by Township Enterprises in China, 1989 (continued)
(Million current yuan)

Province	Garments		Arts & crafts industry		Other	
	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	480.83	334.60	236.86	161.97	124.48	63.10
Tianjin	505.75	405.06	333.60	181.26	268.77	216.66
Hebei	128.37	83.83	378.82	171.27	179.13	120.46
Shanxi	6.35	6.35	14.22	4.35	98.72	80.25
Inner Mongolia	.10	N/A	4.69	.43	5.31	4.05
Liaoning	265.02	183.35	34.47	21.55	91.46	73.35
Jilin	1.02	1.02	4.76	3.95	24.04	13.76
Heilongjiang	.40	N/A	13.22	11.65	67.95	40.18
Shanghai	1,279.30	803.41	336.79	307.26	446.23	302.81
Jiangsu	726.55	382.23	722.00	509.11	549.20	436.40
Zhejiang	402.25	243.29	650.89	469.31	424.76	312.75
Anhui	12.47	8.90	35.78	16.44	24.24	11.94
Fujian	191.10	191.10	239.94	239.94	474.48	474.48
Jiangxi	2.34	1.94	63.19	56.86	36.48	17.51
Shandong	105.59	62.99	540.81	261.52	292.85	214.40
Henan	9.64	5.49	248.30	143.19	106.65	41.32
Hubei	169.90	110.79	39.85	24.49	82.87	48.80
Hunan	3.84	3.55	187.59	149.02	67.53	36.14
Guangdong	599.55	482.46	607.32	423.30	600.67	447.11
Guangxi	.21	.14	95.10	72.10	13.15	10.69
Hainan	N/A	N/A	.50	.50	2.86	2.86
Sichuan	2.59	1.24	8.09	7.71	30.65	28.36
Guizhou	N/A	N/A	.10	.04	.83	.18
Yunnan	N/A	N/A	1.88	1.41	.46	.38
Tibet	N/A	N/A	N/A	N/A	N/A	N/A
Shaanxi	N/A	N/A	6.96	6.13	3.95	N/A
Gansu	.08	.08	12.76	5.23	15.96	N/A
Qinghai	N/A	N/A	3.64	1.02	39.28	5.28
Ningxia	N/A	N/A	.20	.20	.77	.77
Xinjiang	.54	.54	3.99	3.99	13.76	1.07
CITIES						
Chongqing	N/A	N/A	.06	.06	11.13	11.13
Xi'an	N/A	N/A	.21	.21	N/A	N/A
Wuhan	12.08	7.62	4.34	3.75	40.43	25.37
Guangzhou	131.89	80.97	30.07	16.53	57.65	53.15
Shenyang	25.47	21.01	7.07	3.83	10.48	9.20
Dalian	120.03	120.03	2.63	2.63	29.03	29.03
Herbin	N/A	N/A	.35	.35	2.70	1.90
Qingdao	11.11	9.07	125.18	57.57	47.83	42.98
Nanjing	20.56	12.39	6.30	4.70	8.67	7.75
Ningbo	84.17	51.65	118.00	88.31	137.52	117.98
Chengdu	N/A	N/A	.62	.34	5.62	4.53
Xiamen	4.74	4.74	2.84	2.84	4.43	4.43
Changchun	N/A	N/A	1.71	1.53	2.51	2.51

Source: Almanac of China's Town and township Enterprises Yearbook, 1990, pp.168-173.

Table A5. Value of Industrial Products Exported by Township Enterprises in China, 1987
(Current yuan, millions)

Province	Chemical industry		Machinery & electronic		Minerals		Food industry		Local products		Livestock products		Textile industry	
	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	7.2	4.33	20.31	17.77	2.4	1.02	11.6	2.72	.66	.66	5.51	3.15	68.81	64.07
Tianjin	77.99	77.99	87.56	87.56	120.38	120.38	108.76	108.76	48.82	48.82	47.59	47.59	N/A	N/A
Hebei	31.12	26.27	21.75	11.32	5	2.58	52.09	47.93	22.19	12.78	192.46	58.57	27.52	16.22
Shanxi	19.72	15.82	2.64	2.03	35.55	23.89	23.83	22.47	4.52	N/A	3.92	3.71	2.42	2.42
Inner Mongolia	N/A	N/A	1.33	N/A	7.28	6.35	.05	N/A	N/A	N/A	5.77	4.77	.03	.01
Liaoning	5.72	5.72	16.36	15.91	98.73	74.38	265.43	168.06	38	28.29	23.78	18.72	18.88	14.87
Jilin	4	3.79	2	1.84	1.13	.78	.39	.04	19.45	19.44	2.91	2.52	1.34	.74
Heilongjiang	1.15	.91	.03	.03	7.48	3.19	15.4	14.43	5.19	1.97	1.33	.69	23.08	16.64
Shanghai	28.3	19.95	31.26	26.35	132.97	121.54	57.64	44.39	40.63	39.13	49.05	47.35	462.63	387.91
Jiangsu	262.98	204.98	148.85	118.83	4.97	4.86	125.75	99.04	28.78	26.75	118.05	87.02	1377.58	976.94
Zhejiang	67.21	36.13	115.66	82.84	2.4	.89	212.23	149.22	38.22	34.01	40.9	25.14	552.38	361.54
Anhui	1.83	1.39	2.32	.68	5	4.04	18.45	15.19	5.8	1.15	7.88	5.49	10.7	8.01
Fujian	17.41	12.8	2.16	2.16	21.33	13.87	117.32	107.93	38.49	27.06	36.4	23.19	17.28	14.33
Jiangxi	7.14	5.83	.32	N/A	39.85	6.09	21.11	17.18	20.95	7.14	.01	.01	1.75	1.49
Shandong	95.93	93.87	117.62	105.92	60.56	34.15	208.44	172.64	N/A	N/A	74.43	69.87	66.51	48.96
Henan	23.81	19.77	1.71	1.31	37.33	27.51	11.59	10.46	7.32	3.72	16.56	12.76	10.46	8.82
Hubei	14.66	11.51	12.6	8.52	8.25	3.58	8.18	5.76	6.11	4.93	19.33	15.57	114.58	94.97
Hunan	37.5	22.55	8.2	2.6	56.46	34.28	47.91	28.18	31.41	12.84	8.79	6.06	18.64	14.75
Guangdong	60.03	47.42	189.85	185.66	18.9	5.35	98.2	93.3	25	12.86	109.89	108.72	224.94	196.8
Guangxi	12.84	12.34	.83	.83	17.04	11.47	14.42	13.38	4.02	2.14	35.52	32.82	.51	N/A
Sichuan	23.02	17.02	1.03	.84	1.87	1.55	38.1	25.76	5.31	2.51	54.11	52.61	191.57	146.69
Guizhou	1.35	N/A	N/A	N/A	42.16	37.11	.31	.17	1.32	1.32	.71	.3	.04	N/A
Yunnan	1.56	1.23	N/A	N/A	31.08	14.92	21.86	16.19	.39	.39	N/A	N/A	2.41	2.41
Tibet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shaanxi	6.12	4.82	.57	.29	7.18	7.18	2.36	.96	.29	.28	1.88	1.43	N/A	N/A
Gansu	4.74	3.25	N/A	N/A	4.97	4.34	.52	.32	1.26	.94	5.35	5.18	N/A	N/A
Qinghai	N/A	N/A	7.27	7.27	N/A	N/A	.53	.5	N/A	N/A	N/A	N/A	N/A	N/A
Ningxia	3.78	1.34	.09	N/A	6.46	6.46	2.27	2.09	.15	.15	1.37	1.17	.46	.46
Xinjiang	.12	N/A	N/A	N/A	1.29	1.29	.27	.15	.62	.27	.47	.47	.52	.52
CITIES														
Chongqing	1.16	1.16	.26	.13	.17	.17	9.44	7.05	.38	.25	1.43	1.01	32.93	32.93
Xi'an	.91	.19	.1	.1	N/A	N/A	N/A	N/A	.25	.25	.57	.57	N/A	N/A
Wuhan	4.24	4.24	4.96	3.84	.14	N/A	4.09	4.09	.28	N/A	8.82	7.41	1.62	.38
Guangzhou	1.09	.08	10.38	8.68	.01	.01	3.79	3.79	.14	.14	.05	N/A	3.82	3.55
Shenyang	N/A	N/A	.63	.63	N/A	N/A	N/A	N/A	N/A	N/A	7.55	7.55	N/A	N/A
Dalian	1.16	1.16	6.48	6.42	3.65	3.65	218.39	139.44	31.94	24.47	9.65	5.67	13.37	10.99
Herbin	.01	N/A	N/A	N/A	.7	N/A	.44	N/A	N/A	N/A	.19	N/A	N/A	N/A
Qingdao	31.53	31.53	50.13	41.18	50.55	24.63	43.79	40.46	N/A	N/A	14.1	14.03	29.18	6.12
Nanjing	7.8	6.77	.8	.17	N/A	N/A	1	.34	.03	N/A	.13	.11	25.6	16.71
Ningbo	16.66	16.18	13.55	3.99	.63	.07	16.41	14.08	3.9	3.39	3.43	1.15	84.91	65.34
Chengdu	4.32	3.6	N/A	N/A	N/A	N/A	2.75	.78	N/A	N/A	44.05	43.84	N/A	N/A

Table A5. Value of Industrial Products Exported by Township Enterprises in China, 1987 (continued)
(Current yuan, millions)

Province	Garments		Arts & crafts industry		Other	
	Total	Directly exported	Total	Directly exported	Total	Directly exported
Beijing	211.94	133.09	115.82	73.24	52.61	30.54
Tianjin	95.01	95.01	106.78	106.78	96.74	96.74
Hebei	56.58	33.56	263.65	94.85	98.26	48.16
Shanxi	1.05	1.03	4.14	2.19	23.19	13.27
Inner Mongolia	N/A	N/A	9.15	4.61	.44	.41
Liaoning	76.64	69.54	16.76	13.06	39.72	34.42
Jilin	.1	N/A	3.19	2.29	11.89	7.82
Heilongjiang	.53	.3	6.58	4.87	13.85	10.81
Shanghai	567.67	265.13	165.1	141.43	655.26	433.45
Jiangsu	276.1	143.15	423.89	307.35	486.27	327.45
Zhejiang	77.61	32.46	253.25	144.76	288.13	152.47
Anhui	5.38	2.91	17.68	12.81	27.67	15.91
Fujian	58.14	54.44	128.12	114.55	215.54	191.54
Jiangxi	.22	.12	50.06	43.97	17.25	13.31
Shandong	20.38	16.56	204.92	139.91	241.53	228.13
Henan	5.88	1.58	103.86	57.21	37.28	14.57
Hubei	31.86	23.73	20.54	14.62	42.11	28.18
Hunan	6.67	1.96	102.41	94.58	53.99	33.67
Guangdong	277.29	230.11	438.95	389.54	1046.45	843.2
Guangxi	.89	.89	55.38	41.06	20.01	14.1
Sichuan	3.38	3.37	18.65	3.49	75.55	43.39
Guizhou	N/A	N/A	N/A	N/A	1.29	.78
Yunnan	.35	N/A	.51	.51	2.05	.02
Tibet	N/A	N/A	N/A	N/A	N/A	N/A
Shaanxi	.08	.08	8.18	7.95	10.09	7.09
Gansu	N/A	N/A	7.47	3.2	5.78	4.32
Qinghai	1.52	1.26	N/A	N/A	N/A	N/A
Ningxia	N/A	N/A	.65	.55	.3	.3
Xinjiang	.03	.03	4.15	3.07	.89	N/A
CITIES						
Chongqing	N/A	N/A	.74	.24	10.04	5.29
Xi'an	.08	.08	.07	N/A	2.41	1.68
Wuhan	3.5	1.13	1.42	1.07	10.79	7.63
Guangzhou	63.97	39.57	23.62	19.56	119.11	97.62
Shenyang	1.59	1.31	1.5	.31	3.07	1.63
Dalian	55.97	52.11	1.92	1.01	15.95	15.95
Herbin	N/A	N/A	.45	N/A	.04	N/A
Qingdao	15.42	15.42	37.66	20.26	34.22	34.22
Nanjing	17.06	16.64	6.2	4.93	11.75	10.45
Ningbo	27.33	9.89	59.46	38.32	75.42	34.87
Chengdu	N/A	N/A	.72	.65	2.51	.41

Source: Almanac of China's Town and township Enterprises Yearbook, 1978-1987, pp.616-623.

Table A6. Provincial Exports, 1985-1992
(Current U.S. dollars)

Province	Exports 1985	Exports 1986	Exports 1987	Exports 1988	Exports 1989	Exports 1990	Exports 1991	Exports 1992
Beijing	620,750,000	724,850,000	882,360,000	1,002,750,000	1,161,570,000	1,121,640,000	1,370,530,000	1,531,980,000
Tianjin	1,152,740,000	1,254,940,000	1,517,120,000	1,682,680,000	1,686,040,000	1,785,550,000	1,606,360,000	1,752,340,000
Hebei	1,298,540,000	1,053,120,000	1,484,750,000	1,546,260,000	1,637,430,000	1,737,080,000	1,738,850,000	1,781,040,000
Shanxi	226,790,000	302,260,000	345,510,000	344,830,000	400,010,000	458,260,000	509,447,000	583,340,000
Inner Mongolia	137,100,000	171,040,000	226,540,000	293,930,000	336,300,000	324,560,000	418,650,000	N/A
Liaoning	5,042,170,000	3,079,890,000	3,788,000,000	3,874,310,000	4,445,710,000	5,600,000,000	5,770,000,000	6,172,000,000
Jilin	427,120,000	525,150,000	467,660,000	532,140,000	684,470,000	751,720,000	1,027,070,000	1,306,780,000
Heilongjiang	419,300,000	615,370,000	812,100,000	948,580,000	1,027,320,000	1,086,580,000	1,377,500,000	1,831,110,000
Shanghai	3,360,660,000	3,582,450,000	4,159,680,000	4,604,680,000	5,032,420,000	5,317,320,000	5,739,830,000	6,554,740,000
Jiangsu	1,558,510,000	1,719,910,000	2,118,600,000	2,349,870,000	2,441,110,000	2,949,950,000	3,460,530,000	4,670,950,000
Zhejiang	937,680,000	1,156,080,000	1,370,280,000	1,620,230,000	1,879,190,000	2,259,340,000	2,912,580,000	3,702,680,000
Anhui	306,930,000	367,380,000	522,960,000	553,730,000	569,640,000	654,090,000	704,550,000	830,000,000
Fujian	491,480,000	578,540,000	849,330,000	1,405,740,000	1,661,710,000	2,239,130,000	2,925,670,000	4,275,220,000
Jiangxi	275,250,000	305,270,000	402,180,000	489,380,000	515,780,000	561,470,000	609,880,000	774,960,000
Shandong	2,666,690,000	2,135,070,000	2,975,820,000	2,980,190,000	3,063,120,000	3,469,720,000	3,829,040,000	4,733,990,000
Henan	367,100,000	452,630,000	654,340,000	750,520,000	818,970,000	866,890,000	1,042,970,000	1,302,660,000
Hubei	529,850,000	725,470,000	954,950,000	1,074,200,000	1,027,490,000	1,071,800,000	1,162,030,000	1,381,570,000
Hunan	396,060,000	503,050,000	619,450,000	638,600,000	665,630,000	805,520,000	1,016,650,000	1,411,450,000
Guangdong	2,952,670,000	4,251,290,000	5,444,170,000	7,483,820,000	8,167,670,000	10,560,240,000	13,687,870,000	18,439,540,000
Guangxi	372,050,000	430,360,000	543,310,000	544,270,000	584,300,000	729,440,000	832,480,000	1,108,310,000
Hainan	81,130,000	38,400,000	115,450,000	294,960,000	360,820,000	471,380,000	669,640,000	881,200,000
Sichuan	349,390,000	488,730,000	730,300,000	862,870,000	949,170,000	1,116,200,000	1,320,390,000	1,485,560,000
Guizhou	35,540,000	64,960,000	92,960,000	116,150,000	132,010,000	153,047,900	186,880,000	224,240,000
Yunnan	129,010,000	168,930,000	262,260,000	341,[illegible]000	374,420,000	434,490,000	400,970,000	447,380,000
Tibet*	5,080,000	8,450,000	12,150,000	16,060,000	19,820,000	13,940,000	16,130,000	19,300,000
Shaanxi	103,590,000	171,580,000	265,820,000	360,060,000	382,730,000	460,590,000	605,027,000	765,310,000
Gansu	70,980,000	101,070,000	126,600,000	152,050,000	153,380,000	185,740,000	252,840,000	351,770,000
Qinghai	21,229,500	26,430,100	40,145,700	45,583,300	58,490,800	68,046,300	75,516,800	90,430,400
Ningxia	34,160,000	53,380,000	63,100,000	82,210,000	62,480,000	76,790,000	90,290,000	112,760,000
Xinjiang	180,200,000	205,350,000	222,910,000	298,870,000	360,930,000	335,300,000	363,170,000	453,860,000
Calculated total	24,549,749,500	25,261,400,100	32,070,805,700	37,291,483,300	40,660,130,800	47,665,824,200	54,352,810,800	67,444,490,400
Reported total, MOFERT	25,915,610,000	27,014,250,000	34,711,000,000	40,639,520,000	43,439,700,000	N/A	N/A	85,000,000,000
Reported total, Customs	27,350,000,000	30,942,000,000	39,437,000,000	47,516,000,000	52,538,000,000	62,091,000,000	71,910,000,000	84,998,000,000

Note: The provincial and reported total trade figures are all compiled by MOFERT, the Ministry of Foreign Relations and Trade. The MOFERT figures are the sum of statistics reported by various enterprises. MOFERT's provincial figures on exports add to 95 percent of MOFERT's reported total exports, but MOFERT's provincial data on imports account for only 25 percent of MOFERT's reported total for imports. MOFERT trade figures are not as high as Customs figures. This is true for exports and imports.

Sources: Guojia tongjiju. Guanguo gesheng, zizhiqu, zhixiashi lishi ziliao huibian, 1949-1989 [Compilation of Historical Data on Each Province, Autonomous Region and Independent Municipality in China, 1949-1989]. Beijing: Zhongguo tongji chubanshe, 1990. Ma Guoshou, Zhongguo duiwai jingji maoyi nianjian, 1986 [Almanac of China's Foreign Economic Relations and Trade, 1986]. Beijing: Zhongguo zhanwan chubanshe, 1986. 1990-92: Collected from various provincial communiques published in FBIS and provincial yearbooks. Total exports (Customs): China Customs Statistics, no.3 (1993), p.3.

Table A7. Foreign Investment By Province, 1990 and 1991

Province	1990 million US$	1991 million US$	1990 percent of total	1991 percent of Total
Beijing	276.95	244.82	8.7	5.9
Tianjin	34.93	132.16	1.1	3.2
Hebei	39.35	44.37	1.2	1.1
Shanxi	3.40	3.80	0.1	0.1
Inner Mongolia	10.64	1.10	0.3	0.0
Liaoning	243.73	348.88	7.7	8.5
Jilin	17.60	18.00	0.6	0.4
Heilongjiang	24.49	9.43	0.8	0.2
Shanghai	174.01	145.19	5.5	3.5
Jiangsu	124.16	212.32	3.9	5.1
Zhejiang	48.43	91.62	1.5	2.2
Anhui	9.61	9.54	0.3	0.2
Fujian	290.02	466.29	9.2	11.3
Jiangxi	6.21	19.49	0.2	0.5
Shandong	150.84	179.50	4.8	4.4
Henan	10.49	37.91	0.3	0.9
Hubei	29.00	46.43	0.9	1.1
Hunan	11.16	22.76	0.4	0.6
Guangdong	1,460.00	1,822.86	46.1	44.2
Guangxi	28.66	25.32	0.9	0.6
Hainan	103.02	176.16	3.3	4.3
Sichuan	16.04	24.39	0.5	0.6
Guizhou	4.68	7.34	0.1	0.2
Yunnan	2.61	2.96	0.1	0.1
Shaanxi	41.91	31.59	1.3	0.8
Gansu	0.85	0.93	0.0	0.0
Ningxia	0.25	0.18	0.0	0.0
Xinjiang	5.37	0.22	0.2	0.0
Total	3,168.41	4,125.56	100.0	100.0

Source: China Statistical Yearbook, 1992, p.643.

Note: Qinghai and Tibet were missing; these figures do not include investment via ministries. These figures were reported as utilized direct foreign investment.

Table A8. Variables Relating to Export Performance: Names and Sources

DFI90: Provincial share of total direct foreign investment, 1990. Source: Table A7.

PRTOEX89: Provincial share of total exports, 1989. Source: Table 8.

PRTOEX93: Provincial share of total exports, first quarter 1993. Source: Table 9.

LTEXP: Share of light industrial goods in total exports, 1990. Source: Table 4.

PRFOEX93: Share of total exports from foreign invested firms, first quarter 1993. Source: Table 9.

FOREXP93: Exports from foreign invested firms as a percent of total provincial exports, first quarter 1993. Source: Table 2.

EXGDP89: Exports as a percent of provincial gross domestic product (GDP), 1989. Source: Table 8.

PRGDP89: Provincial share of total GDP, 1989. Source: Compilation of Historical Data on Each Province, 1990.

COLL: Provincial share of gross value of industrial output (GVIO) produced by collective enterprises, 1991. Source: Table 1.

STATE: Share of GVIO produced by state enterprises, 1991. Source: Table 1.

INDIV: Share of GVIO produced by individual enterprises, 1991. Source: Table 1.

OTHER: Share of GVIO produced by enterprises other than collective, state, or individual enterprises, 1991. Source: Table 1.

DECENTRL: Share of GVIO produced by the non-state sector (collective, individual, and other enterprises), 1991. Source: Table 1.

OPENDFI: Direct foreign investment in 1990 as a percent of 1989 provincial GDP. Sources: Table A7 and Compilation of Historical Date on Each Province, 1990.

BIBLIOGRAPHY

Chen Yaobang. Various years. Zhongguo xiangzhen qiye nianjian, various years [Almanac of China's Town and Township Enterprises]. Beijing: Nongye Chubanshe.

Goldstein, Carl. 1992. "Numbers game." Far Eastern Economic Review (24-31 December), pp.72-73.

Guojia Tongji Ju. 1990. Quanguo gesheng, zizhiqu, zhixiashi lishi ziliao huibian, 1949-1989 [Compilation of Historical Data on Each Province, Autonomous Region, and Independent Municipality in China, 1949-1989]. Beijing: Zhongguo tongji chubanshe.

Guojia Tongji Ju. Various years. Zhongguo tongji nianjian [China Statistical Yearbook]. Beijing: Zhongguo Tongji Ju.

Lardy, Nicholas R. 1992. Foreign Trade and Economic Reform in China, 1978-1990. Cambridge: Cambridge University Press.

Ma Guoshou. Various years. Zhongguo duiwai jingji maoyi nianjian [Almanac of China's Foreign Economic Relations and Trade]. Beijing: Zhongguo zhanwan chubanshe.

McGregor, James. 1992. "Investment is Pouring into China, But Beware the Penchant for Hype." Wall Street Journal (25 November), p.A10.

Nee, Victor. 1992. "Organizational Dynamics of Market Transition: Hybrid Forms, Property Rights, and Mixed Economy in China." Administrative Science Quarterly, no.37, pp.1-27.

Prybyla, Jan. 1993. "How Should the U.S. Handle Trade Issues with China?" East Asian Executive Reports 15.4 (April): 9-15.

Qing Gongye Fazhan Zhanlue Yanjiu Zhongxin. 1991. Zhongguo qing gongye nianjian 1991 [China Light Industry Yearbook, 1991]. Beijing: Zhongguo Qing Gongye Nianjian She.

Ren Dan, "China Will Unify Rates Next Year." China Business Weekly (28 November 1993).

Zhongguo Jixie Dianzi Gongye Nianjian (Jixie Juan) Bianji Weiyuanhui Bian. 1991. Zhongguo jixie dianzi gongye nianjian [China Machinery and Electronic Industries Yearbook, 1991]. Beijing: Jixie Gongye Chubanshe.

Zweig, David. 1992. "Reaping Rural Rewards," China Business Review (November-December), pp.12-13, 15-17.

Zweig, David. 1991. "Internationalizing China's Countryside: The Political Economy of Exports from Rural Industry." China Quarterly, no.128 (1991):716-741.

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