China's Bamboo Product Trade: Performance and Prospects

Submitted by:

Dr. Feng Lu

The principal investigator

China Center for Economic Research of Peking University (CCER)

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1. Introduction

Bamboo products have once been named "timber of the poor", inferior substitutes for wood products by poor people who are constrained by low income and purchase power. Utilization of bamboo resources has been traditionally dominated by direct consumption of local bamboo farmers with weak linkage with market. This general pattern has changed in recent decades during which a process of commercialization of bamboo economy, and integration of bamboo sector with domestic and international markets has been underway. Bamboo has become one of the most versatile and widely utilized groups of plants. Their uses range from basketry, weaving, mats, furniture to industrial ply-bamboo panels, flooring and construction materials, and from paper-making to bamboo shoots, essential oils and medicines (Ganapathy, Janssen and Sastry, 1996).

Dynamic growth of the Chinese bamboo sector presents one important example for this transformation. The last two decades witnessed a rapid growth of the Chinese bamboo economy brought about by marketed oriented reform, opening-up to the world economy, growing utilization of inputs of modern technology as well as integration of bamboo economy with domestic and foreign markets. Contrast to the picture of shrinking in the area of arable land and forestry areas, the areas of bamboo land increased from 3.20 million ha. in the period of 1979-81 to 3.79 million ha. in the period of 1989-93, up by 18.4 per cent in the 1980s. The total value of bamboo products as forestry output increased from 412 million yuan in 1980 to 8608 million yuan in 1997. The total value of bamboo processing output reached at 9580 million yuan in the mid-1990s. The growth rate of bamboo sector has been substantially higher than that for the forestry or agriculture as a whole. The noticeable achievement is that bamboo has become a dynamic sub-sector in the forest economy in terms of the linkage with the international market. Exports of bamboo products reached the magnitude of US$ 300-400 million in the mid-1990s.

Growth of the Chinese bamboo sector over the last two decades or so displays special economic properties. First, unlike the majority of the Chinese exports that are labor-intensive manufactured products, bamboo products are closely associated with forestry or agricultural sectors that are conventionally viewed as weak sectors in China on the basis of relatively poor endowment of land resources in per capita term. Strong expansion of bamboo products is exceptional in comparison with most of other forestry and agricultural products which competitiveness in the international market is eroding during the process of rapid industrialization. Second, bamboo production in China mainly locates in mountainous and hilly regions in which per capita incomes

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for peasant are usually relatively low in part due to poor physical and social infrastructures. Some bamboo producing areas are still in poverty. Growth of the Chinese bamboo economy not only contributes to the economy in the regions, but also has positive social implications in terms of poverty relief. Third, as a re-cycling or re-producing resource, bamboo grows more quickly than other forestry. Development of bamboo products as substitutes for timber products sector may reduce the environment burden brought about by consumption of forest products. Growth of bamboo economy has arguably has created positive externality both in income distribution and environment protection.

Although the bamboo resource is important to the Chinese agriculture, the topic has not attracted the attention of researchers to a significant extent. Most of published research papers dealt with the Chinese forestry sector as a whole or focused on wood forestry[2] whereas specialized research on bamboo sector is rare. On the other hand, basic statistics on bamboo economy are incomplete or subject to controversies. The situation nevertheless started to change in recent years. In part as a result of the efforts of INBAR to promote academic research in bamboo and rattan economy, several studies have been conducted recently to examine the Chinese bamboo sector. Kant and Chiu (1999) and Ruiz-Periz et al. (1999) are two household level case studies on bamboo economy in Anji and Linan counties in Zhejiang province respectively. Also collaborated with INBAR, Zhong and his associates conducted researches to review China's bamboo and rattan sector (Zhong, Xie, Fu and Xie, 1995; Zhong and Liu, 1999).

As far as the Chinese bamboo product trade is concerned, most of the previous studies point out the impressive growth of the exports of bamboo products, but few have had a specific account of the issue. As the only exception, Zhong, Xie, Fu and Xie (1995) present the time series data for the Chinese bamboo product trade. Some general issues of the Chinese bamboo product trade are discussed. Many problems remain nevertheless with respect to the subject. For example, aggregate measurements for the Chinese bamboo trade yet to be clearly clarified in part due to changes in the statistical codes and inconsistency between different data sources in the area. There is lack of information about the trade performance for dis-aggregated categories of bamboo trade and structural changes of the bamboo trade. Distribution of export destiny and domestic ports are yet to be examined in the previous studies. Problems and prospects for the Chinese bamboo trade have not been surveyed and researched.

The proposed study is an integral part of the strategic agenda set by INBAR to conduct a series of research on bamboo economy in major production and trade countries through effective collaboration with local research partners. Aiming to give a thorough investigation on the subject of the Chinese bamboo product trade, it will collect and analyze the relevant data in a systematic way so as to produce an overall account on the Chinese trade sector for bamboo products. Apart from utilization of all available published data, a survey will be attempted to search for information at firm-level regarding the economic and policy environment as well as prospects for the Chinese bamboo product trade.

The organization of the report is as follows. Following this introductory section, section 2 gives an overview on the bamboo land resources and production of the

[2] For example, Menzies and Peluso (1991) examined the evolution of rural forest management in Yunnan Province. Sun (1992) offered an overall account of China's rural forestry development while Yin(1994) gives an overview of the reform process of China's rural forestry.

bamboo sector in China. Causes for the growth of the bamboo production will also be briefly discussed. Observation in this section serves to clarify the background setting in which the performance of the Chinese bamboo product trade evolves. Section 3 examines two major official data sources for China's bamboo product trade. Changes in the statistical codes with respect to bamboo trade will be examined with a view to give an appropriate interpretation of the officially published trade data. Section 4 presents the aggregate data for the Chinese bamboo trade (exports and imports). Commodity structure of the bamboo trade will be observed. Section 5 and 6 examine distribution of export destinations and custom ports for China's exports of bamboo products respectively. Section 7 presents the results of a firm survey study in the Chinese bamboo processing and trade sector. Section 8 summarizes the founding of this research and discusses their policy implications.

2. Institutional reform and growth of bamboo production

China has a tradition of bamboo management and use in its long history back to thousand years. With rich resources in bamboo production and incentive brought about by the policy reform in direction of market orientation and opening-up to the outside world, bamboo sector plays an increasingly important role in China's agricultural and rural development. Ten counties are named Bamboo Counties in which bamboo assumes a dominant role in local economy. In order to clarify the background settings for the performance of the Chinese bamboo trade, this section reviews various aspects of the Chinese bamboo sector such as land resources, growth of production in bamboo outputs both at the stage of forestry and industrial processing activities. First of all, it is necessary to give a brief introduction to the institutional reform that laid the foundation upon which the process of rapid growth of bamboo economy as well as the whole economy in China has been evolved in the last 20 year or so.

2.1 Institutional transformation and policy reform

During the period of the centrally planning economy in the 1950-70s, China adopted two types of ownership and management for her forest economy. One is the state owned forest resources system that was applied to 9 provinces and regions mainly in the northern part of China such as Inner Mogolia, Heilongjiang etc.[3] The other one is southern collectively-owned forest area covers 10 provinces and regions[4]. Different management regimes were applied to the two categories of forest areas. Most bamboo producing areas locate in the regions of the second type of system in which bamboo land was collectively owned by productive team under a commune which served as the grass-root level of government. Production and other economic activities are unified organized and managed, bamboo products together with other major agricultural products are unified distributed. The system was characterized by depression of market price signal and lack of incentive for farmers. It is not surprising that this collective system was inefficient and its performance was poor.

In 1979 China initiated the major reforms that started the process of a transition from a centrally planned economy to a market economy. This transformation unleashed one of the largest development efforts ever undertaken, with worldwide repercussions. In 20 years or so, China moved from an essentially autarchic peasant economy to an incipient industrialized country with an export-oriented economy.

With reference to bamboo sector, the institutional transformation and policy evolutions over the last 20 years or so have also made great contribution to its dynamic growth.

(1) Reform of land tenure and production system

The core concept of the rural reform was the shift from collectively run foams based in the commune to family farms based on the "household responsibility system (HRS)". The basis of the HRS is a transfer of land use rights by the commune or natural village to farmers who manage the land for their own benefits. Forestry is an

[3] Other provinces and regions including Jilin, Yunnan, Sichuang, Xizan, Shanxi, Gansu and Xinjiang which area of forest represents about 53% of total forest in China (Shuai Zhonghe, 1992a). Bejing, 1992).

[4] They consist of Hubei, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Guangdong Guangxi, Guizhou, Hainan, (Shuai Zhonghe, 1992b).

integral component of rural economies and land use systems in mountainous areas of China. In March 1981, the government of China introduced the first major forest reforms[5]. The new policy (named the "3-Decisions") involved 3 aspects of reforms: (1) to stabalize forest ownership (wending senlin quanshu); (2) to distribute part of collectively owned forestlands to farmers as responsibility mountains (huading ziliushan); (3) to distributed part of the collective forestland for farmers as contract mountain land (linye shengchang zerenzhi). The "3-Decisions" reform was largely completed nationwide by the end of 1984 (Li Zhou, 1997). It was later clarified that individual farmers are entitled to the ownership right to the forestry planted by themselves. The ownership right of the planted forestry may be transferred to the owners' next generation (CPC Central Committee, 1983). The terms of duration for the contract of forestland were usually defined as 15 years.

As the 15-year contract period expired at the early 1990s, new reform measures were introduced to extend the contract period for another 30 or 50 years. Three principles of the reform were also put forward in the new round of land reform. First the contract land will not be increased as a result of increase of number of persons for a given farm household (zenren bu zendi). Second, the contract land will not be reduced as a result of reduction of number of persons for a given farm household (jianren bu jiandi). Third, the use-rights of the contract forestlands are allowed to be transferred with price on a basis of market transaction (chengbaodi keyi youchang zhuanrang) (Zhong and Liu, 1999).

(2) Reform of bamboo distribution system

Bamboo was classified as the second type of agricultural commodities under the system of the state monopoly of purchase and marketing of agricultural products during the period of centrally planned economy. As a result, the distribution of bamboo was conducted through unified procurement and marketing by Supply and Marketing Cooperative, the monopolistic agency assigned by the state to conduct the distribution of most of agricultural commodities and inputs (such as fertilizer, pesticides etc) for agricultural production. From 1980, the Government attempted to reform the monopolistic regime. One measure implemented in 1980 was the quota system: farmers were assigned quota of delivery of forest products to the state at the administrative prices set by the state. After fulfillment of the quota, farmers may sell their products at the market or to the state at negotiated prices. Another policy introduced in 1981 distinguished forest materials into two types of standard forest and non-standard forest (guige cai he fei guige cai). Non-standard forest may be sold by farmer at market. As there were some problems occurred with respect to the reforms[6], implementation of the reform policy soon faced interruptions. In 1985 decisive reform measure was undertaken to marketize the distribution of foresty products (including bamboo) in the southern collectively owned forestry areas. In 1985, the old system of state procurement of bamboo products was abolished, market for bamboo was completely opened and prices for bamboo were essentially determined by the force of supply of and demand for bamboo at the markets (Shuai, 1992b; Zhong and Liu, 1999).

[5] The Central Committee of the Communist Party of China and the State Council: "Decisions with regard to selected issues on protection forest and development of forest industry (Guanyu baohu senlin fazhan linye ruogan wenti de1jueding), March 1981.

[6] They include: prices for forest materials hiked; farmers were reluctant to sell forest of good quality to the state, some farmers over-harvested forest materials etc.

In line with the reform policies, measures have been taken to facilitate development of rural enterprises and open the Chinese economy to the outside world. The Chinese economy during the centrally planned period was characterized by segregation of urban and rural sector in which the urban sector was designed to develop industry whereas rural area was deem to confine to agricultural activities. Rural residents were restricted in engaging in non-agricultural activities. This social-economic structure started to change from the 1980s. During 1983-1985, several official documents were issued to encourage processing activities of agricultural products to be conducted in rural areas. Associated with the objective, important policy reforms were made to encourage development of all forms of firms in rural areas. This laid the institutional foundation upon which township and village enterprises (TVEs) as well as private firms (named individual firms then) flourished. This change paved the way for growth of rural industries including processing and manufacturing of bamboo products in the second half of 1980s and further development in the 1990s (The CPC Central Committee, 1983; State Council, 1984A and 1984B; CPC Central Committee and State Council 1984; CPC Central Committee, 1985). On the other hand, parallel to domestic institutional reform, vigrous measures were taken to open-up the Chinese economy to the world. Policies were implemented to attract foreign investments to set up firms in China and encourage the Chinese produced goods to be exported in the international markets. The shifts in the policy stance and economic environment provide favorable condition for exports of bamboo products.

2.2. Land resource for bamboo production

It is widely accepted that China is one of the largest countries in terms of endowment of bamboo land resources and standing timber volume of bamboo. However the reported figures on the area of bamboo lands in China from different sources are inconsistent and therefore need a clarification.

In a book prepared by experts organized by the Comprehensive and Planning Department of the Ministry of Forestry (MoF) of China, the total area of bamboo land in China is 7 million ha., of which the areas of the planted forests with possible economic utilization (rengong yongcailin) are 4 million ha. and "clump of bamboo forests in high mountainous regions (gaoshang zhucong) are 3 million ha." (Li Yucai, ed. 1996). As reported by Ruiz-Perez, M., et al. (1999), bamboo in China is concentrated in mountainous and hilly regions in which it constitutes a key element of the forest landscape. The total bamboo is 7 million ha., of which 3.2 million are natural forest and the rest bamboo plantation. Of 3.8 million ha. of bamboo plantation, 2.7 million ha. is moso bamboo. Another English study on the Chinese bamboo economy gives similar figures for bamboo lands[7]. In a journalist article, total area of bamboo land is reported as 4.4 million ha., 39 per cent of the world's total bamboo lands (Tang Xiuping, 1999).

In view of controversies about the reported areas of the Chinese bamboo land resources, it is useful to define two concepts of bamboo lands on the basis of the structure of the bamboo land resources in China. The total areas may be measured in broad and narrow ways respectively. The broad measurement is 7 million ha. that includes all bamboo lands that physically exist in China. Of the total 7 million ha. of bamboo land, about 3 million however are located in high mountanious regions and

[7] "China is home to more than one quarter of the world's total bamboo area and occupies 7 million ha. of which plantation area is about 3.8 million ha. and 3.2 ha. are mountainous area under wild culms. Total bamboo area is 2.95% of China's total forest area (Kant and Chiu, 1999: pp. 2-3).

classified as the regions of natural protection (Ziran baohu qu). This category of bamboo lands is not viable for economic or commercial utilization either because they are preserved for special uses such as the habitat for panda or simply due to the geographical condition prohibiting from economic uses. The narrowly defined area of bamboo lands excludes the area of this category of special bamboo lands. In remaining parts of this report, the area of bamboo land refers the narrowly defined area unless otherwise specified.

MoF has conducted five forestry surveys from 1973-76. Results of the most recent survey conducted in the period of 1994-98 have yet to be published. On the basis of the published results of previous surveys, Zhong, Xie, Fu and Xie (1995) and Zhong and Liu (1999) report the data for the area of bamboo land as well as the standing timber volume in China.

As indicated by Table 2.1, the area of bamboo land grew from 320 million in 1979-81 to 379 million ha. in 1989-93, at the annual growth rate of 1.56 per cent. Standing timber volume increased from 64.75 million tons in 1979-81 to 96.32 million tons, at the annual growth rate of 3.68 per cent. The growth of bamboo standing timber volume is the combined result of growth in the area of bamboo lands and level of standing timber volume per unit of bamboo land. Of total bamboo lands, the area of moso bamboo takes a lion share. However the proportion of moso bamboo land declined significantly to 68.1 per cent in 1989-93, almost 10 points of percentage lower than 11 years ago.

(Table 2.1. China's bamboo land and bamboo resources: Selected years of 1979-93)

Table 2.2 shows the geographical distribution of the Chinese bamboo lands. Overwhelming majority of the Chinese bamboo land is located at provinces in the Yangzhi River Valley or further southern regions. The share of bamboo lands by the 10 provinces and regions were above 95 per cent during the period of 1979-1993. Although the figure may change, this basic structural feature with respect to the distribution of bamboo land is expected to be unchanged in more recent years.

(Table 2.2. Regional distribution of China's bamboo land: Selected years of 1979-93)

Fujian, Hunan, Zhejiang and Jiangxi are "the Big Four" in terms of endowment of bamboo land. Each of them possessed more than 50 million ha. of bamboo lands in the early 1990s. Fujian has the largest area of bamboo land that increased from 58 million ha. to 68 million ha.during the period. "The Big Four" as a whole account for more than 60 per cent of the total bamboo lands in China.

2.3. Growth of bamboo outputs as forestry products

Bamboo sector involves two stages of production activities: forest production and industrial production of processing. The bamboo production at the stage of forestry production mainly produces bamboo materials and bamboo shoot. Quantity and value of the bamboo production in selected years since 1980 are reported in Table 2.3.

(Table 2.3. Quantity and value of bamboo materials and bamboo shoots: Selected years of 1980-97)

Total value increased from 412 million yuan in 1980 to 8608 million yuan in 1997. The area of bamboo land was only 2.95 per cent of that for the forestry land in China (Kant and Chiu, 1999) while the gross output value of bamboo sector in 1997 was

10.6 per cent of that for the forestry sector as a whole in the same year[8]. Total value in nominal terms grew by 19.9 times during the period of 1980-97, substantially higher than the similar measurements for forestry sector or the broad agricultural sector as a whole which were 9.0 and 11.8 times respectively for the same period[9]. The average growth rate for the value of bamboo products at forestry stage was 19.6 per cent for the period of 1980-97. Using retail price index as a deflator[10], the real annual average growth rate during the period was 11.1 per cent. Of two major categories of bamboo products as forestry output, the value share of bamboo shoots increased from about 16 per cent in 1980 to about the one third in recent years.

Table 2.4 reports the prices for selected bamboo products as forestry outputs and measurements of more broad price indexes. It is interesting to note that apart from bamboo paper, the growth rates of price for bamboo products were much higher than those for farm products or retail commodities as a whole. The average price index for bamboo products in 1993 was 444 per cent of that in 1978, in comparison with the price index for farm products and the retail price index that were 202 per cent and 236 per cent respectively. The data indicates that the real price for bamboo products increased substantially during the period. As a matter of an economic principle, changes in the relative price of a commodity in the long run reflect changes in the intensity of scarcity for the commodity that is determined by the forces of demand for and supply of the commodity. We have just now discussed the evidence that supply of bamboo products has been substantially higher than that for the average level of agricultural production. The high growth of the relative prices for bamboo products implies that demand for bamboo products must have shifted outward more quickly than that for the usual agricultural commodities. As income is usually one of the most important factors behind the growth of demand for a normal commodity, it is reasonable to believe that bamboo products are rather income elastic in China. Bearing in mind the necessity of a specific research for producing reliable estimated parameters on the relationship between the level of per capita income and demand for bamboo products, the above observation is interesting and suggestive. We may reasonably assume that as per capita income continues to grow, demand for bamboo is likely to grow at a relatively fast path.

(Table 2.4. Prices for selected bamboo products and general price indexes: Selected years of 1980-93)

2.4. Bamboo products as industrial outputs

Statistics on bamboo processing products are also scarce and incomplete. The most comprehensive data on industrial activities come from the national industrial census. The Third National Industrial Census of China, the most recent one of this kind, was conducted in 1995. Three statistical items concerning bamboo processing and related activities are report in the data of the Third National Industrial Census data in 1995. They are “the sector of bamboo materials harvesting and transport (zhucai caiyun ye)”, “the sector of processing activities using materials of bamboo, rattan, palm and straws (zhu teng zong chao zhipin ye)”, “the sector of bamboo and rattan furniture”[11].

[8] Gross output value for forestry sector in 1997 was 81777 million yuan (“China Statistical Yearbook 1998”, p. 390).

[9] The magnitudes of nominal growth for forestry and agricultural sector are calculated using gross output data for the sectors in “China Statistical Yearbook 1998”, p. 390.

[10] Retail price index in 1997 is 352 with that in 1980 as 100. The index is calculated using retail price index data in “China Statistical Yearbook 1998”, p. 302.

[11] Other two broader items of statistics also cover elements of bamboo. They are “wood and bamboo

Other bamboo processing activities such as that in the sectors of bamboo paper, canned bamboo etc are not reported in published results of the census. The three items of bamboo statistics are reported for 3 different categories of firms, of which two are presented in Table 2.5 and 2.6.

(Table 2.5. Bamboo related activities for firms of village-run, private, cooperative-run and individual-run with annual sales of over 1 million of the Chinese Yuan at the level of township and above the level of township in 1995)

(Table 2.6. Bamboo related activities for firms of village-run, private, cooperative-run and individual-run with annual sales of over 1 million of the Chinese Yuan in 1995)

Table 2.5 reports data for all forms of firms with annual sales of over 1 million of the Chinese yuan at the level of township and above the level of township whose business relate to bamboo related activities. There are 52 firms in the business of harvesting and transport of bamboo materials with employment of 3500 workers and annual revenue of 87 million yuan. There are 3045 firms in producing manufacturing goods using materials of bamboo, rattan, palm and straws with employment of 175000 workers and annual revenue of 6940 million yuan. For the sector of bamboo and rattan furniture, there are 411firms with employment of 612000 workers and annual revenue of 1110 million yuan. Table 2.6 reports similar data for firms of village-run, private, cooperative-run and individual-run with annual sales of over 1 million of the Chinese yuan.

The above data are problematic and incomplete for the purpose of this study at least in three aspects. First, there is lack of information with respect to the share of bamboo products in the categories of "manufacturing goods using materials of bamboo, rattan, palm and straws" and "bamboo and rattan furniture". Second, the data do not cover small rural firms in the sector of bamboo processing whose annual revenue less than 1 million yuan. There are evidences indicating substantial proportion of small rural firms in the sector generate annual turnover less than 1 million yuan[12]. Third, other bamboo related processing activities such as bamboo paper, canned bamboo shoots are not covered or specifically revealed in the data[13].

In view of the data deficiencies, Zhong and Liu (1999) estimated the annual output value for bamboo processing activities in the mid-1990s using the national industrial census data and information from other sources. It should be born in mind that the detailed method and data sources for the estimation are not well documented in their paper. The estimated results of Zhong and Liu (1999) are nevertheless suggestive and useful. On the basis of their estimation, total value of bamboo processing activities in the mid-1990s was about 9850 million yuan. Of various bamboo processing commodities, bamboo mat was by far the most important one, contributing to about 35 per cent of total value of bamboo processing activities. Man-made bamboo plank

harvesting and transport" and "wood processing and manufactured goods using materials of bamboo, rattan, palm and straw".

[12] A survey on 41 counties and municipalities in Hunan province indicate that there are 17997 firms with employment of 158000 workers and annual revenue of 1140 million in the bamboo processing sector. They account for 61% of total output bamboo materials and bamboo shoots processing (Zhong and Liu, 1999, p.53). The average annual output value for the surveyed firms are less than 60000 yuan.

[13] There are data for various canned foods such as canned fruits and canned vegetables. It is believed that the canned vegetables may have covered canned bamboo shoot that nevettheless are not specifically reported.

and bamboo flooring together assumed about 18 per cent of the total output value in the area. Other two categories of bamboo processing commodities are bamboo paper and processed bamboo shoots that took 14 per cent and 17 per cent of the total value of bamboo processed activities respectively. Table 2.7 presents their estimated data.

(Table 2.7. Estimated annual output values for the Chinese bamboo processing sector in the mid-1990s.)

On the basis of the above discussion, the output value of bamboo materials and bamboo processing commodities was 17353 (7772.9 plus 9580.0) million yuan in 1995.

2.5. Summary

As a result of implementation of policies of market-oriented reform and opening up to the outside world, the institutional environment for the development of the Chinese bamboo sector has fundamentally changed during the last 20 years. Bamboo land which used to be collectively owned by commune and unified managed has been largely contracted to farmers on family basis for long periods of 30-50 years. The old state monopoly in purchase and marketing of bamboo products was abolished in the mid-1980s and market for bamboo has been liberalized since then.

China is endowed with rich bamboo production resources. The area of bamboo lands increased from 3.20 million hectares in 1979-81 to 3.79 million hectares in 1989-93, up by 18.4 per cent in the period. Bamboo standing timber volume increased by 48.8 per cent to 96.32 million tons from 64.75 million tons in the same period. Bamboo forestry lands are most located in the 10 provinces and regions in the Yangzi River Valley or to further south. Fujian, Hunan, Zhejiang and Jiangxi are the largest provinces with respect to the bamboo land endowment.

The value of bamboo materials and bamboo shoots, the two main bamboo products as forestry output increased from 412 million yuan in 1980 to 8608 million yuan in 1997. The growth rates for the value of bamboo products were substantially higher than the average level of agricultural or forestry production as a whole. The total value of bamboo processing products was estimated at 9580 million yuan in 1995. Bamboo plaited products such as bamboo mats and other handicraft products contributed the value of 6470 million yuan in 1995, taking the lion share of the value of bamboo processing products. Other two categories of bamboo processing products were bamboo paper and canned bamboo shoots whose gross product value were 1410 million yuan and 1710 million yuans respectively in 1995. The total gross value of the Chinese bamboo economy was estimated at 17358 million yuan in 1995.

3. Data Sources and Changes in the Statistics Collection Convention

3.1. Data sources for the Chinese bamboo product trade

The data sources for the Chinese bamboo product trade are mainly from two officially published yearbooks. The first is "China's Customs Statistics Annual Report or Yearbook (Zhongguo haiguan tongji nianbao or nianjian)" published by the Chinese customs authority. "China's Customs Statistics Annual Report" which was published before the Chinese Communist Party took over the national power in 1949 provides data sources for bamboo products trade during the period of the 1950s and the first half of the 1960s. Due to the interuption from the "Cultural Revolution", publication of "China's Customs Statistics Annual Report" stopped during the period from 1965-1980. As a result there were no official data avialable for the bamboo products trade over the period. "China's Customs Statistics Annual Report" re-published from 1981 and was renamed as "China's Customs Statistics Yearbook" with more detailed trade statistics from 1990.

The second source is "Yearbook of the Chinese Foreign Trade and Economy (Zhongguo duiwai jingji maoyi nianjian)" published in 1984 by the Ministry of Foreign Trade and Economy of China. This yearbook provides data with respect to the Chinese bamboo products trade for the period of 1982-95. "Yearbook of the Chinese Foreign Trade and Economy 1996/97" was experienced substantial changes in its coverage and contents. As a result most of bamboo trade data are not reported in the yearbook in recent years any more.

The Chinese customs authority is the only official agency responsible to nationwide collection of the exports and imports data. However it only publishes the official trade data up to certain degree of detail, ie. data of 8-digital tariff code in recent years. Since the compiling section of "Yearbook of the Chinese Foreign Trade and Economy" affiliated to the Ministry of Foreign Trade and Economy of China has access to the more detailed data collected by the customs authority, the yearbook may provide some trade data not in "China's Customs Statistics Yearbook". As will be discussed later, significant differences exist between the two data sources with respect to classifications and magnitudes of the data for the Chinese bamboo products trade in various periods.

3.2. Changes in statistical categories for bamboo products trade in the customs annual reports and yearbooks

"China's Customs Statistics Annual Report or Yearbook" has experienced several major changes since 1950. The changes may be divided into two types: The first is the change with respect to the title of statistical category for the bamboo product trade. The second type of change is about the statistical code with respect to a given category of data. In order to make meaningful utilization of the data, it is necessary to have a brief discussion of the changes in statistical category for the Chinese bamboo products trade in different periods over the last 50 years or so.

(1) 1950-1953

The data of bamboo products trade reported in "China's Customs Statistics Annual Report" in this period were divided into 4 categories:

(i) Whole bamboo;

(ii) Bamboo materials such as slice of bamboo, bamboo leaf in this period;

(iii) Bamboo processed products;

(iv) Bamboo shoots as a vegetable.

There were two special features with respect to the statistical convention for the bamboo product trade in this period. First, there were two different data codes for the bamboo trade data: statistical code (tongji hao) and tariff-rule code (shuize hao). Second, different data code for exports and imports of a given bamboo product were used in 1950. A new system of data code was used from 1951 with an unified application to both imports and exports of a given commodity. Table 3.1 reports data codes for bamboo product trade introduced in 1951.

(Table 3.1. Statistical codes for bamboo product trade introduced in 1951)

(2) 1954-1964

The data codes introduced from 1951 were only used for a short period of 3 years. A new set of data codes for bamboo product trade was introduced in 1954. The new data codes were designed on the basis of "The Drafts of the Unified Commodity Category for Foreign Trade of the People's Republic of China (Zhonghua renmin gongheguo duiwai maoyi tongyi shangpin mulu caoan)". The bamboo trade data in 1952-53 were adjusted in line with the new data code. In the new system, bamboo trade products were divided into 3 categories with respective statistical codes:

(i) Bamboo shoots;

(ii) Bamboo;

(iii) Bamboo processed products.

Another relatively minor change occurred in 1959 after which bamboo shoots ceased to exist as an independent data category. Sub-categories of data codes for bamboo products were also modified.

Due to historical reasons, the export destinies for bamboo trade were only reported under two categories of "capitalist countries" and "socialist countries" in the period. As a result, it is impossible to trace export flows at the individual country level on the basis of the published trade data.

Table 3.2 reports changes in statistical categories for bamboo products trade in the customs annual reports during 1954-1964.

(Table 3.2. Statistical codes for bamboo product trade: 1954-1964)

(3) 1981 and afterwards

Due to political turmoil of the Cultural Revolution (1966-1976), publication of "China's Customs Statistics Annual Report" stopped during the period of 1960-80. Regular publication of the annual book was resumed from 1981. It was renamed as "China's Customs Statistics Yearbook" (from "nianbao" to "nianjian") in 1990. Although trade data in the recent 20 years are much more systematic and in higher level of disaggeregation, there have been several adjustments and changes with respect to statistical code. The most important change occurred in 1992. Prior to 1992, "Customs Statistical Commodity Category of the People's Republic of China (Zhonghua renmin gongheguo haiguan tongji shangpin mulu)" was designed on the basis of "Standard International Trade Classification (SITC) by the United Nation. In 1992, "Customs Statistical Commodity Category of the People's Republic of China" was restructured in line with "The Harmonized Commodity Description and Coding

System (HS)" complied by the Customs Cooperation.

As indicated in Table 3.3, the major changes with respect to bamboo product trade associated with the restructuring the Chinese custom statistical convention in 1992 were mainly three folds. First, tariff codes for individual commodities are all changed from 5 or 6 digital figures into the standard 8 digital figures. For example, statistical codes for the fresh bamboo shoots and trace of dry bamboo shoots were changed from "054594" and "05615" into "07099010" and "07129010" respectively. Second, products such as canned bamboo shoots, rattan and other products which did not have separate statistical codes in the old custom statistical yearbook were assigned individual statistical codes in the new statistical convention. Third, the statistical code for bamboo furniture existing in the old yearbook was abolished in the new yearbook.

(Table 3.3. Changes in statistical codes for bamboo product trade since 1981)

There was another adjustment in statistical codes for bamboo product trade in 1997 that involved two changes. First, canned bamboo shoots with single statistical code (20059030) was changed into two separate codes: one (20059031) for canned bamboo shoots with the volume over 8 liters and the other one (20059030) for other canned bamboo shoots, reflecting the growing importance of bamboo shoots in the Chinese bamboo product exports. Second, the statistical code for salted water bamboo shoots was changed from 07099010 into 07119031. As a result, there are currently 10 basic statistical codes for bamboo product trade reported in "China's Customs Statistics Yearbook" (See Table 3.3).

3.3. Changes in statistical categories for bamboo products trade in "Yearbook of the Chinese Foreign Trade and Economy"

"Yearbook of the Chinese Foreign Trade and Economy" included four categories of bamboo products when it was first published in 1984.

(i) Winter bamboo shoots, trace of the dried bamboo shoots and salted water bamboo shoots under the heading of vegetables.

(ii) Bamboo wares and manufactures.

(iii) Wild bamboo fungus.

(iv) Special bamboo handcraft products such as bamboo fan, bamboo comb etc.

The statistical codes for bamboo products were modified in 1986 with two major changes. First, "winter bamboo shoots" was replaced by "fresh bamboo shoots". Second, "salted water bamboo shoots" was replaced by "water bamboo shoots".

A major change was made to restructure the statistical coverage and codes for "Yearbook of the Chinese Foreign Trade and Economy" in 1996. Apart from "plaited bamboo products (zhu bianzhipin)" and "trace of the dried bamboo shoots (sun gan si)", data for trading activities on most of other bamboo products were not reflected in the yearbook from its volume of 1996/97. Statistical coverage for bamboo products and its changes in "Yearbook of the Chinese Foreign Trade and Economy" are summarized in Table 3.4.

(Table 3.4. Statistical coverage for bamboo products and its changes in "Yearbook of the Chinese Foreign Trade and Economy")

3.4. Comparison of the two data sources

In order to make an appropriate observation of the Chinese bamboo product trade, we

need to understand the relationship of the reported data between the "China's Customs Statistics Yearbook" and "Yearbook of the Chinese Foreign Trade and Economy". For the sack of simplicity, the first data source of yearbook was referred as "the custom yearbook" and second as "the trade yearbook" below. Now let's have a brief comparison of the two data sources with respect to their statistical coverage, definition of individual category of commodities and other related issues.

(1) Similarity between the two data sources

Most commodities in the category of bamboo shoots are comparable in statistical definition between the two yearbooks. For example, the meaning of fresh bamboo shoots and trace of the dried bamboo shoots are exactly the same in the two yearbooks. Figures for "water bamboo shoots" in the trade yearbooks is roughly equal to the sum of "salted bamboo shoots" and "canned bamboo shoots" in the custom yearbooks. As a whole, data discrepancies for commodities in the category of bamboo shoots between the two data sources are insignificant.

(2) Differences between the two data sources

They differ at least in three ways. First, each of the two yearbooks includes some commodities that do not appear in the other yearbook. For example, "bamboo fan (zhushang)", "bamboo comb (zhubi)","bamboo cut (zhuke)" whose trading volume and value are reported in the trade yearbook are not covered in the custom yearbook. On the other hand, "bamboo furniture (zhuzhi jaiju)" and "bamboo seats (zhuzhi zuoju)" whose trading volume and value are reported in the custom yearbook are not covered in the trade yearbook. Additionally, the custom yearbook reports both export and import statistics for bamboo product trade whereas the trade yearbook only covers the import data for bamboo products

Second, data for certain commodities may be collected under different headings in two yearbooks but they do not add up in the figures. For example, bamboo materials such as " (maozhu) (lizhu), (haozhu) (zhazhu) "bamboo leaves (zhuye)" whose trading volume and value are reported respectively in the trade yearbook but not appear with the same headings in the custom yearbook. It may be guessed that these bamboo materials should be covered under the heading of "category of bamboo (zhulei)" in the customs yearbooks. However the sum of the figures for the above 5 bamboo materials in the trade yearbook in a given year substantially differ from the figure for "category of bamboo" in the customs yearbooks.

Third, some data for a giving statistical heading in the two yearbooks may be different. For example, both of the yearbooks report data for "bamboo plaiting products (zhu bianzhi pin), however the reported figures in a given year are substantially different between the two yearbooks.

On the basis of interview with officials concerned, a hypothetical explanation may be found for this observed phenomenon. The reason is rather simple. The compiling section of the trade yearbook affiliated to the Ministry of Foreign Trade and Economy of China is entitled to have access to the more detailed data collected by the customs authority. As the compiling section has discretionary power with respect to releasing of the data, the trade yearbook may provide some trade data not reflected in the customs yearbook. As far as the third difference is concerned, they may simply reflect technical errors of editing or printing in either of the yearbooks over which it is difficult to trace out.

4. Growth of the Chinese Bamboo Product Trade

Discussion in the previous section indicates the possible incompleteness in the statistical coverage of each of the two major data sources for the Chinese bamboo product trade. It also reveals the similarities and differences between two data sources. In view of the facts, we adopt the following strategy in reporting and discussing the trade data for the Chinese bamboo products. This section examines the data for individual commodity and the aggregate data for the bamboo product trade as a whole. The custom yearbook data and the trade yearbook data will be separately reported. A synthesized data series will be produced to account for incompleteness of each of the two data sources for the Chinese bamboo trade (direction of likely bias of the data in the series will also be discussed). The next sections investigate the issues with respect to the geographical aspect of the trading activities such as export destination and distribution of domestic ports. Discussion of these issues will completely rely upon the data from the custom yearbooks.

China's exports of bamboo products developed rapidly especially in the 1980s and first half of the 1990s. Although our main interest is to investigate the trading activities since the 1980s, it is nevertheless appropriate to have a brief look at China's bamboo product trade prior to the 1980s.

4.1. China's bamboo product trade in the 1950-60s

As one of the major forest products, bamboo has played an important role in its export sector since the People's Republic of China was founded in 1949. Value for the export of the bamboo products was US$ 1.28 million in 1950 and reached US$ 3.51 million in 1957. The average export value for bamboo product was about US$ 2.50 million during the period from 1950 to 1964 (Table 4.1). In view of the frequent changes in statistical conventions and inadequacy in custom data collection procedure, there are likely omissions in the trade figures. As a result, the reported data may under-estimate the real trading activities.

(Table 4.1. China's exports of bamboo products: 1950-1964)

Total export data for the period are presented in Figure 4.1 that highlights four distinct features of the trading activities during the period of 15 years. First, notwithstanding of significant fluctuations, there was a strong growing trend for the bamboo product exports during the period from 1950 to 1958. Annual export value increased from US$ 1.54 million in 1950/51 to US$ 3.41 million in 1957/58 at the annual growth rate of 12 per cent. Second, export of bamboo products declined sharply in 1959 and was kept at low level in the following two years. Third, exports of bamboo products picked up again from 1962 and showed a sign of growing trend since then. Fourth, in terms of the structure of the trade, most of the exported bamboo products are primary output of bamboo such as bamboo materials and unprocessed bamboo shoots. This pattern of bamboo product exports reflected the structure of the Chinese economy as whole in that period which was dominated by agricultural sector.

(Figure 4.1. China's exports and imports of bamboo products: 1950-1964)

Starting from a very low base level, imports of bamboo products also grew strongly during the period. Import value increased from US$ 110 in 1950 to US$ 112753 in 1961 and peaked at US$ 417296 in 1964. In spite of growth in bamboo imports, the magnitude of bamboo exports was much larger than that of imports, led to substantial surplus in trade for the sector.

(Table 4.2. China's imports of bamboo products: 1950-1964)

4.2. Overview of China's bamboo product trade from the 1980s

As mentioned above, the subject of China's bamboo product trade will be observed using two official data sources: the custom yearbook and the trade yearbook. Data on China's bamboo product trade from the two statistical sources are presented in Table 4.3 and 4.4 respectively. As a result of the major change with respect to statistical coverage for the trade yearbook occurred in 1996 that removed most of the reported bamboo products in previous yearbooks, there were no data available for the trade yearbook data series from 1996. Statistics presented in the two tables provide the data basis for analysis of China's exports of bamboo products in this section.

(Table 4.3. China's bamboo exports from the customs yearbooks: 1981-2000)

(Table 4.4. China's bamboo exports from the trade yearbooks: 1982-1995)

To highlights changes in the aggregate exports of the Chinese bamboo product, the total export values from the two data sources are presented in Figure 4.2. As discussed in the section 3, because of difference in data coverage, the reported data in two tables are not entirely consistent. For example, during the period of 1993-95, the average annual value of total exports of the Chinese bamboo product was US$ 351.5 million, 10.6 per cent higher than that of US$ 317.9 million reported by the customs yearbook.

(Figures 4.2. China's total export value of bamboo products: 1981-2000)

As shown in Figure 4.2, performance of the Chinese bamboo exports over the last 20 years or so presents 3 distinct pattern in 3 different periods. The first period is from 1981 to 1985 during which the total value of the bamboo product exports fluctuated between US$ 46.1 million to US$ 63.2 million. No growing trend for the total export value was observed during the period. Actually the total export value of US$ 46.1 million in 1985 (the lowest figure in the period) was substantially lower than that of US$ 63.2 million in 1981 (the highest figure in the period).

The second period is from 1986 to 1995 during which the total bamboo product exports experienced remarkable growth. Using the customs yearbook data, total export value increased from US$ 47.4 million in 1985 to US$ 369.4 million in 1995, at the average annual growth rate of 22.8 per cent. The similar measurements from the trade yearbook increased from US$ 57.1 million in 1985 to US$ 412.7 million in 1995, at the average annual growth rate of 21.9 per cent. This was really a golden period in terms of the expansion of bamboo product exports in China.

The third period is from 1996 to 2000 during which the total bamboo product exports experienced dramatic decline. Using the customs yearbook data, total export value declined from US$ 342.6 million in 1995/96 to US$ 252.2 million in 1998/99 with the average annual decreasing rate of 7.9 per cent. In part due to strong recovery of the Asian economies, China's bamboo exports in 2000 increased significantly to an estimated level of about US$ 300 million.

Table 4.5 and Figure 4.3 present the data for import value of bamboo products. Total import value was kept at low level of less than US$ 0.5 million until 1990. Import value increased dramatically to over US$ 3 million in 1995 but fell drastically to less than US$ 2 million in the following two years. The last three years witnessed strong growth of bamboo imports again with the estimated import value of over US$ 4.5 million in 2000. In spite of the strong growth, the Chinese bamboo imports have still remained a fraction (about 1.5 per cent) of the export value of bamboo products,

revealing an overall comparative advantage assumed by the Chinese bamboo sector.

(Table 4.5. China's bamboo product imports: 1981-2000)

(Figure 4.3. Total value of China's bamboo product imports: 1981-2000)

4.3. Exports of bamboo shoots products

Figure 4.4.displays the data for the three categories of bamboo products and their percentage share in the total export value. The figure reveals a noticeable structural change in the Chinese bamboo exports over the last two decades or so. The relative share of bamboo processed products has declined while that for bamboo shoots has increased dramatically. Now let's observe and discuss export performance for each individual category of bamboo products.

(Figure 4.4. Value shares of China's major bamboo product exports: 1981-99)

We first of all look at exports of bamboo shoots products. As indicated in Table 4.6 and Figure 4.5, China's exports of bamboo shoots mainly includes four categories of commodities: fresh bamboo shoots, salted-bamboo shoots, dried trace of bamboo shoots and canned bamboo shoots.

Bamboo shoots have been a traditional export commodity which exports have been growing since the 1950s. The exports of bamboo shoots have grown tremendously since 1981 when publication of the custom yearbook was resumed after interruption of the Cultural Revolution. Canned bamboo shoots had not been assigned independent statistical code until 1992. Exports of the other three items of bamboo shoots products increased from US$ 3.3 million in 1981 to US$ 30.6 million in 1990, almost 9 times as high as 10 years ago. Exports of bamboo shoots products continued their strong growth in the first half of the 1990s. Value of the exports increased from US$ 105 million in 1992 to US$ 171 million in 1996. However, exports of bamboo shoots products declined greatly in recently years. Export value in 1998/99 was US$ 138 million, 17.4 per cent down from its peak value in 1995/96.

(Table 4.6. China's exports of bamboo shoots 1981-99)

(Figure 4.5. Value share of bamboo shoots products in total exports of bamboo shoots products: 1981-99)

Of various bamboo shoots products, canned bamboo shoots are by far the most important product in terms of export promotion in recent years. Because the canned bamboo shoots had not been assigned statistical code in official trade statistics, it is difficult to find out how much canned bamboo shoots had been exported before 1992. In 1992, canned bamboo shoots accounted for 64.8 per cent of the total bamboo shoots exports and this measurement increased to 87.1% in 1998. In contrast, salted bamboo shoots and dry bamboo shoots together contributed to more than 80 per cent of total bamboo shoots exports in the early 1980s, now their collective share has declined to less than 10 per cent[14].

There are evidences indicating that the decline of the bamboo shoots exports in recent years was mainly brought about by factors from demand side rather than supply side. China had to impose voluntary export quota on its water bamboo shoots exports from 1996, indicating more strict constraint from the demand side. On the other hand, decline in export revenue was mainly caused by fall in the prices. For example,

[14] There were maybe some canned bamboo shoots reported in the exported salted bamboo shoots befroe 1992.

canned bamboo shoots took the lion share of total exports of bamboo shoots products. As shown in Table 4.6, exports of canned bamboo shoots in 1998/99 was marginally higher than that in 1995/96, indicating that the fall of export revenue was mainly caused by weak demand in the international markets. As will be discussed in the next section, major destinations for the Chinese bamboo shoots exports are Japan and other East Asian economies. It may be reasonably believed that the Asian economic crisis in recent years and its negative impact on the market demand in these economies should be the main causes for decline in the Chinese bamboo exports observed in recent years. It may be further inferred that exports of bamboo shoots may pick up again as the East Asian economies recovered from the crisis and China completes the process of accession into WTO.

4.4. Exports of bamboo processed products

Of different commodities in the category of bamboo processed products, bamboo-plaiting products has been by far the largest item. In the early 1950s, exports of bamboo plaiting products were about US$ 0.8-0.9 million but dropped to US$ 0.44 million in 1954 and recovered to the level of the early 1950s by 1964. Its share in total bamboo exports was about the two thirds in the early 1950s and declined to one the seventh and then recovered to a quarter in the first half of the 1960s (See Table 4.1). Exports of the bamboo plaiting products continued growth during the period of the second half of the 1960s and the 1970s when publication of the custom yearbook stopped. When the new customs statistics were regularly published again from the 1980s, value of exports for bamboo plaiting products reached US$ 53 million which accounted for about 80 per cent of total bamboo product exports[15]. Exports of bamboo plaiting products did not grow rapidly until the late 1980s. Its export value reached US$ 90 million. Its exports increased very fast in the early 1990s and peaked at the level of US$ 164 million in 1995. However it declined substantially to less than US$ 92 million, roughly equal to the level at the late 1980s. Plaited bamboo products have took the lion share of the exports of bamboo processed products. In the 1990s, the proportion of plaited bamboo products in the total value of the bamboo processed products has usually been over 95 per cent. Other important exported bamboo processed products include bamboo furniture, bamboo-cut, bamboo fan and bamboo comb etc.

(Table 4.7. China's exports of bamboo processed products: 1981-99)

4.5. Exports of bamboo materials

Bamboo materials were by far the largest category of total bamboo products exports in the 1950-60s (Table 4.1). As shown in Table 4.8 and Figure 4.6, exports of bamboo materials increased from the 1980s. Its exports in recent years were several times as high as that in the early 1980s. However its relative share in the total exports of bamboo products was reduced substantially from that in the 1950s. Its proportion was around 10 per cent in the last two decades or so.

(Table 4.8. China's exports of bamboo materials: 1981-99)

(Figure 4.6. China's exports of bamboo materials: 1981-99)

The main reason for the decline of the relative share of the bamboo materials was growth of exports of bamboo shoots on the one side and the growth of bamboo

[15] Because the data for canned bamboo products were not available, the percentage figure may have been over-estimated.

manufactured products such as plaiting bamboo products on the other side. It indicates the tendency that exports of bamboo products are shifting from raw materials and semi-manufactured bamboo products to manufactured products with more value added elements in their total value and to more income elastic products such as bamboo shoots.

It is interesting to note that imports of the bamboo materials increased substantially from US$ 0.1 in 1981 to US$ 2.11 million in 1994. Imports of bamboo materials accounted for nearly 80 per cent of total imports of bamboo products in the 1990s (See Table 4.5). Decline of export share and increase of export share for bamboo materials clearly indicate the general progress of the Chinese industrialization during which foreign trade are changing from exporting of raw materials based products to that based on industrial processing and value added activities.

5. Destination of China's bamboo product exports

Following examination of the product structure for China's bamboo exports in the previous section, this section looks at the distribution for destinations of China's bamboo product exports. Data on destinations of bamboo product exports will be presented both in forms of tabular and diagram. We shall first observe the data for the total bamboo product exports. Major categories of exported bamboo products will be then dealt with respectively.

5.1. Destinations of total bamboo product exports

Table 5.1 presents data on destinations of China's total bamboo product exports in selected years from 1981. Figure 5.1 shows part of the data in pie diagram. The striking feature reflected in the data is the strong growth in the Japan's market share for China's bamboo product exports associated with substantial decline in Hong Kong's market share. In 1981, Japan's market share for China's bamboo product exports was only 7 per cent, similar to that for countries such as US, Italy and UK, far less than that for Hong Kong that took the lion share of 45 per cent then. Japan's share has nevertheless increased throughout the period. The growth accelerated dramatically in the first half of the 1990s during which the Japan's market share increased from 19 per cent in 1990 to 53 per cent in 1995 whereas that for Hong Kong declined from 48 per cent to 9 per cent. This dramatic change was in part brought about by big foreign direct investment projects by the Japanese and other investors in Zhejiang on bamboo processing sector especially canned bamboo shoots. As a result, the position of "middleman" in the business chain linking the bamboo sector of the mainland China and other economies including Japan traditionally enjoyed by Hong Kong businessmen was severely weakened. Japan's market share further increased to 58 per cent in recent years.

(Table 5.1. Destinations for China's total bamboo product exports: Selected years from 1981)

(Figure 5.1. Destinations for China's total bamboo product exports: Selected years from 1981)

Apart from Hong Kong and Japan, the US and Europe have also been important markets for China's bamboo product exports. The market share of US declined from 9 per cent in 1981 to 4 per cent in 1990, but bounced back to 10 per cent in 1995 and retained the share of 10 per cent in recent years. Italy, UK, France, German and Netherlands have been major European countries as destinations for China's bamboo product exports. In 1998/99, these 5 countries represented 11.7 per cent of market share for China's total bamboo product exports. Finally, Asian economies such as Korea, Taiwan emerged as new markets for China's bamboo product exports. The market share for Korea and Taiwan was about 3 per cent in 1998/99.

5.2. Destinations of fresh bamboo shoots exports

Table 5.2 presents data on destinations of China's fresh bamboo shoots product exports. Figure 5.2 shows part of the data in pie diagram. As indicated in the pie diagram, the structural change in distribution for China's fresh bamboo shoots exports may largely be represented by transition of dominant market from Hong Kong to Japan. In the early 1980s, Hong Kong occupied 94 per cent market for the Chinese fresh bamboo shoots exports leaving only 6 per cent market for other countries of which Japan accounted for about 4.5 per cent. The picture changed rapidly in the

1990s: Japan's market share increased to 56 per cent in 1985 and further to 75 per cent and 93 per cent in 1990 and 1995. In 1998/99, apart from Japan that imported 88 per cent of China's exports of fresh bamboo shoots, Hong Kong, US. Vietnam and Taiwan were important markets for China's fresh bamboo shoots exports.

(Table 5.2. Destinations of China's fresh bamboo shoots exports: Selected years from 1981)

(Figure 5.2. Destinations of China's fresh bamboo shoots exports: (Selected years from 1981)

5.3. Destinations of salted water bamboo shoots exports

Table 5.3 presents data on destinations of China's salted water bamboo shoots product exports. Figure 5.2 shows part of the data in pie diagram. As indicated in the pie diagram, the dominant feature with respect to distribution for destination of China's salted water bamboo shoots exports was that Japan has been by far the most important market for China's salted water bamboo shoots exports. In four representive years of 1981, 1985, 1990 and 1995, Japan's market share for China's salted water bamboo exports ranged between 90-98 per cents whereas the market share by the rest of the world was fractional. In 1998/99, Japan's market share declined to 78 per cent while some East Asian economies especially Taiwan increased their market share.

(Table 5.3. Destinations of salted water bamboo shoots exports: Selected years from 1981)

(Figure 5.3. Destinations of salted water bamboo shoots exports: Selected years from 1981)

5.4. Destinations of dried bamboo shoots exports

Table 5.4 presents data on destinations of China's dried bamboo shoots product exports. Figure 5.4 shows part of the data in pie diagram. In the 1980s, the Chinese exports of dried bamboo shoots went to East Asian economies of which Hong Kong initially took the lion share but later Japan took over Hong Kong and became the most important destination. Japan has benn by far the largest importer country for China's dried bamboo shoots exports at latest from 1990 and its market share increased to 90 per cent in 1998/99. There were other noticible changes in distribution for destination of China's dried bamboo shoots export in the second half of the 1990s. First, the market share for Thailand increased substantially to 14 per cent in 1995 and remained the second largest country in terms of importation of China's dried bamboo shoots in the recent years. Second, some other countries outside East Asia such as German, US started to import China's dried bamboo exports.

(Table 5.4. Destinations of China's dried bamboo shoots exports: Selected years from 1981)

(Figure 5.4. Destinations of China's dried bamboo shoots exports: Selected years from 1981)

5.5. Destinations of China's canned bamboo shoots exports

Table 5.5 presents data on destinations of China's canned bamboo shoots product exports. Figure 5.5 shows part of the data in pie diagram. Due to the constraints on data availability discussed in previous section, the periods for the presented data starts from 1993. As clearly showed in the pie diagram, Japan occupies 84-92 per cents of the market share for China's exportation of canned bamboo shoots. Data in Table 5.5

indicate that Hong Kong and US are the second and third largest importers of canned bamboo shoots respectively. Of other importers, Taiwan, Korea, German are relatively important.

(Table 5.5. Destinations of China's canned bamboo shoots exports: Selected years from 1993)

(Figure 5.5. Destinations of China's canned bamboo shoots exports: (Selected years from 1993)

5.6. Destinations of China's bamboo materials exports

Table 5.6 presents data on destinations of China's bamboo materials exports while Figure 5.6 shows part of the data in pie diagram. In comparison with exports of bamboo shoots products, destinations for China's exports of bamboo materials are much more diversified. The market shares for the first importers (Hong Kong and Japan) have never exceeded 40 per cent. On the contrary, the collective market share assumed by other economies excluding 5 largest importers has been relatively large: ranging from 24 per cent to 30 per cents. Hong Kong, Japan, the United States and European countries (UK, German etc) are major importers for China's bamboo materials exports. On the other hand, Taiwan became an important market for the Mainland China's bamboo materials exports.

(Table 5.6. Destinations of China's bamboo materials exports: Selected years from 1981)

(Figure 5.6. Destinations of China's bamboo materials exports: Selected years from 1981)

5.7. Destinations of China's plaiting product exports

Finally Table 5.7 presents data on destinations of China's bamboo plaiting product exports and Figure 5.5 shows part of the data in pie diagram. The fact that the collective market share assumed by other economies excluding 5 largest importers has ranged from 20 per cent to 33 per cent also indicates the relative diversification for destinations of China's plaiting product exports. In the 1980s, Hong Kong was by far the largest importer of China's plaiting products, occupying the market share between 43-55 per cents. In the 1990s, Hong Kong market share declined substantially to about 10-14 per cents while the importance of imports by the United States, Japan and some European countries increased. In 1998/99, Japan, the United States and Hong Kong took 26 per cent, 20 per cent and 10 per cent of the market shares respectively while France and Britain accounted for 6 per cent of the market share each, leaving 33 per cent of the market for other countries.

(Table 5.7. Destinations of bamboo plaiting product exports: Selected years from 1981)

(Figure 5.7. Destinations of bamboo plaiting product exports: (Selected years from 1981)

5.8. Summary

Destinations of China's bamboo product exports are mostly concentrated on East Asian countries and economies. Apart from Japan, Hong Kong, other East Asian economies such as Taiwan, Korea became important emerging markets for China's bamboo product exports. The United States and some European countries are also important importers of China's bamboo products.

The most important structural change with respect to destination of China's bamboo products over the last 20 years or so has been the transition of the leading role in the market share from Hong Kong to Japan. In the 1980s, Hong Kong was by far the largest export market for China's bamboo product exports. However, as Hong Kong's role of "middleman" in trade was weakened, Japan took over the largest market share for China's bamboo product export in the 1990s. In recent year, Japan accounted for more than half of China's total bamboo product exports and her market share for some bamboo products was even as high as 90 per cent.

Of major categories of bamboo product exports, export markets for bamboo shoots are much more concentrated than other products such as bamboo materials and bamboo plaiting products. For exports of various bamboo shoots products, the market shares for 5 largest importers have been 95 per cent or even higher, leaving only fractional proportion of the collective market share for other countries. For bamboo materials and bamboo plaiting products, similar measurements of market share for other countries are usually above 20 per cent or even exceeding 30 per cent.

6. Distribution of shipping ports for China's bamboo product exports

This section observes the distribution of domestic customs ports from which exports of China's bamboo products are shipped overseas. We first examine the distribution of shipping ports for various bamboo shoots products and then discuss that for bamboo materials and bamboo plaiting products.

6.1. Shipping ports for China's bamboo shoots exports

Table 6.1 presents the data on shipping customs ports for 4 categories of China's bamboo shoots exports during the period of 1997-1999. As indicated by the data, distribution of shipping ports for different bamboo shoots products vary greatly.

(Table 6.1. Shipping ports for China's bamboo shoots exports: 1997-99)

The shipping ports for fresh bamboo shoots are most concentrated on Eastern and Southeast coasts. The most important shipping ports are Shanghai, Fuzhou and Hangzhou. The Shanghai customs port alone accounted for 35.3-35.9% of fresh shoots export while the 3 ports together shipped out 68.1–79.3% of fresh bamboo shoots. Other shipping ports include Ningbo, Huangpu, Guangzhou etc.

The exports of salted water bamboo shoots are largely shipped out from the northern port city of Tianjin and the southern ports of Huangpu and Chongqing. The share of Tianjin ranged from 25.7-35.6% during the 3 years period from 1997 to 1999 while that for Huangpu and Chongqing together from 29.1-47.7%. Guangzhou, Shanghai, Shenzhen are also important ports for exportation of salt-water bamboo shoots.

The shipping ports for exports of dried bamboo shoots are largely located at south coast. Three port cities of Guangzhou, Shantou and Shenzhen accounted for 87.4-89.2% of exports of dried bamboo shoots in 1997-99. Ports of Fuzhou, Huangpu and Xiamen also play a role in shipping out dried bamboo shoots.

The shipping ports at southeast and east take the lion share in shipping out of canned bamboo shoots exports. Xiamen, Shanghai, Ningbo and Fuzhou collectively accounted for 83.2-86.6% of exports of dried bamboo shoots in 1997-99. Southern port cities of Shenzhen and Shantou are also important shipping port cities for exports of canned bamboo shoots.

6.2. Shipping ports for exports of bamboo materials and plaiting products

Table 6.2 presents the data on shipping customs ports for bamboo materials and bamboo plaiting products. For exports of bamboo materials, Guangzhou is by far the most important shipping port. The share of shipping out of bamboo materials by the port of Guangzhou ranged from 47.1-54.3%. Other two southern ports of Shenzhen and Huangpu accounted for 21.3-26.6% of shipping out assignments. Shanghai, Fuzhou and Xiamen are also important port cities in shipping out of bamboo materials.

(Table 6.2. Shipping ports for bamboo materials and bamboo plaiting products: 1997-99)

The shipping ports for bamboo plaiting products are most concentrated on Eastern and Southeast costs. The most important shipping ports are Shenzhen, Shanghai and Fuzhou. The 3 customs port together accounted for 72.6-86.9% of plaited bamboo products. Other important shipping ports for plaited bamboo products include Ningbo, Huangpu, Guangzhou etc.

6.3. Summary

Geographical location of major shipping ports for main categories of China's bamboo product exports are summarized in the following table (Table 6.3). For example, major shipping ports for fresh bamboo shoots are Shanghai, Fuzhou, Hangzhou and Ningbo etc which are located at East and Southeast coast.

Table 6.3. Geographical location of Shipping ports for China's bamboo exports (1997-1999)

Bamboo Products	Major Shipping Ports	Geographical Location
Fresh bamboo shoots	Shanghai; Fuzhou; Hangzhou; Ningbo	East + Southeast
Salted-water bamboo shoots	Tianjin; Huangpu; Chongqing, Guangzhou	North + South
Dried bamboo shoots	Guangzhou; Shantou; Shenzhen	South
Canned bamboo shoots	Xiamen; Shanghai; Fuzhou	Southeast
Bamboo materials	Guangzhou; Huangpu; Shenzhen; Shanghai	South + East
Bamboo plaiting products	Shenzhen; Guangzhou; Shanghai	South + East

7. A survey study of China's bamboo processing and trade sector

Perhaps due to the fact that China's bamboo processing and trade sector has been a young industry, there are virtually no information about this sector from the micro-level of firms in the area. It is felt necessary by the researchers of this study to conduct a survey study with a view of gathering information about the industry from the firms' level.

Difficulty with respect to a firm survey is the availability of the contact information for the firms in this sector. Though there is bamboo industry association associated with a department of the State Forestry Bureau, the organization is yet to fully operate and therefore does not have the information in a systematic way. Constrained by resources and time, it is not possible for this study to collaborate with the related provincial government agencies or other institutions to search for the contact information for the firms. With the helps from Dr. Mangtang Cai, Dr. Zhu Zhaohua and other staffs of INBAR, we have managed to pool together the correspondence addresses of 71 firms in the industry. A specially designed survey questionnaire was been posted to these firms as an attempt of this survey study. In part due to the out-dated nature or incompleteness of the address information, only 21 responses of questionnaires have been received as of the end of 2000. As a result, this survey study has limitations. Obviously the sample size is small. On the other hand, due to various reasons, the survey sample may be bias and over-represent the large-medium sized bamboo processing firms but under-represent the small sized firms. One needs therefore to be cautious in making inference about the Chinese bamboo sector on the basis of this survey study. Bearing in mind the limitations, the survey information is useful and important in view of scarcity of the firm-level information for this sector. The survey study is expected to help have a glance of the snap-shoot picture of the Chinese bamboo sector at the turn of the centuries and may generate interests or provide a starting point for further survey studies in this area in future.

7.1. Description of the surveyed firms

As indicated by Figure 7.1, 32 per cent of the surveyed firms locate in Zhejiang province, 24 per cent in Fujian, 10 per cent in Hainan and Hunan respectively, and 24 per cent in other provinces such as Guangdong, Jiangsu, Sichuang, Anhui etc. As for the economic categories of the surveyed firms, 48 per cent are stated owned or collective firms, 33 per cent are of private or share-holding types and 29 per cent are foreign or joint-venture firms (Figure 7.2). The bamboo sector of value-added processing activities and foreigh trade has been a young industry. It is shown in Figure 7.3, more than half of the surveyed firms started business in bamboo processing and foreign trade in the 1990.

(Figure 7.1. Provincial distribution of the survey firms)

(Figure 7.2. Economic categories of the survey firms)

(Figure 7.3. Starting times of bamboo processing and foreign trade activities by the survey firms)

7.2. Domestic production and marketing of the bamboo sector

Table 7.1 reports the selected economic indicators for the survey firms. The average size of the bamboo firms are reflected by two indicators: 24.23 million Yuan (close to US $ 3 million at the official exchange rate) of total annual sale and 14.39 million Yuan (US $ 1.74 million at the official exchange rate) of total annual output value of

bamboo products. The firms in the average have annual profit of 1 million Yuan (US $ 0.12 million) and pay tax and fees of 2.32 million Yuan (US $ 0.28 million). Costs of bamboo material input as the proportion of the total bamboo output value for the survey firms vary between 1 per cent to 70 per cent, with 39 per cent as the simple average, indicating strong economic linkage of this sector to the forestry and rural economies.

(Table 7.1. Selected economic indicators of the survey firms)

Figure 7.4 and 7.5 reflect the origins of the bamboo materials of inputs to bamboo processing sector as well as relative importance for the various ways by which firms purchase bamboo materials. Half of the bamboo materials used by the processing firms are from the same counties in which the firms locate, 32 per cent from other counties within the provinces in which the processing firms locate. This confirms the general impression that bamboo processing and trade activities have close ties with the local rural economies through the linkage of demand for and supply of bamboo as raw materials. As for the channels of purchasing bamboo materials by the firms, 48 per cent of bamboo materials utilized by the survey firms are directly purchased by the firms at the local markets, 16 per cent are delivered by bamboo farmers, 36 per cent are purchased through other agent firms.

(Figure 7.4. Channels of purchasing bamboo raw materials)

(Figure 7.5. Origin sources of bamboo raw materials)

Figure 7.6 reports the structure of the market for the bamboo processing products. 35 per cent of the bamboo outputs produced by the survey firms are exported to foreign markets, 38 per cent are sold to the other provinces, and the rest of 27 per cent are either to local counties (11 per cent) or other counties within the local provinces.

(Figure 7.6. Market distribution of bamboo products)

Although the bamboo sector enjoyed the unprecedented growth in the recent decades, many bamboo processing and trade firms have experienced difficulties in the domestic markets in recent years. On the basis of the survey results, 70 per cent of the sample firms complain “low prices with slim profits”; 65 per cent blame “unfair competition of other firms such as selling faulty products or products of inferior quality at low prices”. Some surveyed firms face difficulties such as weak market demand, local protection against competition, credit constrains and lack of information on bamboo products by consumers.

7.3. Export activities of the bamboo sector

Of the surveyed firms of bamboo processing, 71 per cent are engaged in exportation of bamboo products. As mentioned above, the survey study may have an upward bais in reflecting the real size of the Chinese bamboo processing firms. Because the relative large firms are more likely to engage export activities, the proportion of 71 per cent may over-report the degree of international integration of the Chinese bamboo sector. The figure is nevertheless indicative of significant linkage of the Chinese bamboo economy with the world market that is consistent with the general observation on this industry.

The survey study generates interesting information regarding the issues of how the Chinese bamboo processing firms obtain information on the world market and in what way did they actually engage in foreign trade activities. 69 per cent of the survey firms currently utilize “the internet facilities” to search for information in the

international market, 46 per cent at least once sent personals abroad to search for the market information, 15 per cent use newspapers and agency institutions in this context. As for the issue of how did the firms start the business of foreign trade, 53 per cent were approached by domestic trading firms to provide bamboo products for exports and 40 per cent of the firms were contacted by the foreign companies to export products. Some firms started export business as a result of their own search for foreign buyers.

As far as the size for the foreign trading partner companies is concerned, the medium-sized company has been mentioned by 58 per cent of the replied survey firms; the small company by 33 per cent replied firms, the large firm mentioned by 25 per cent firms. Of the economic categories of the foreign trading partner companies, 69 per cent of the surveyed firms reply that they are trading companies; 46 per cent answer that they are whole-sale companies, 31 and 23 per cents of the survey firms mention retail company and processing company respectively[16]. Being asked whether has your business been negatively effected by the Asian Economic Crisis, 67 per cent of the replied firms answer "yes" whereas 33 per cent give "no". Of the firms that have been adversely influenced by the crisis, the average decline of bamboo products sale as a result of the Asian Economic Crisis is estimated at 30 per cent. This adds evidence for the significant linkage of the Chinese bamboo sector to the international economy.

As for the domestic shipping ports used for the bamboo product exports, most of the survey firms choose Shanghai and Guangzhou. The following shipping ports include Ningbo, Xiamen, Shenzhen and Fuzhou. In terms of factors considered by the exporting firms in choosing the ports, length of distance and transport costs are the most important factors. 64 per cent of the survey firms mention "the distance between the relevant firms and the port as well as the transport costs over the distance". 18 of the survey firms reply "the distance between the export destination and the port as well as the transport costs over the distance". Some firms mention factors such as difference in the service quality in different ports, special requests from the trading partner firms etc.

What are the most important factors constraining the growth of the Chinese bamboo product export? 64 per cent of the survey firms pick up the factor of "lack of skilled personals with professional knowledge and experience in foreign trade"; 50 per cent of firms mention the factor of "lack of information about the international market"; 43 and 34 per cents reply "inadequacy of policy support" and "imperfection in product quality" respectively. Factors such as "lack of capital" and "lack of suitable technology" have also been suggested by 21 and 14 per cents of the survey firms respectively.

What can the governments do to help the Chinese bamboo sector and boost the exports of bamboo products? Three main suggestions have been put forward by the survey firms in this context. First, the government has been asked to provide supportive policies especially in terms of reduction of the tax and fees burdens for the industry. Second, to establish the industry association that may, among other things, provide with the firms more information on the markets. Third, to simplify the procedure for exports of bamboo products and provide the firms with the independent rights in exportation of bamboo products.

[16] Because different economic categories for the trading partner company indicated by the survey firms may overlap, i.e., a company may be both trading company as well as wholesale or processing company, percentages of various answers may not add to 100 per cent.

8. Summary and concluding remarks

This study has investigated aspects of the Chinese bamboo-product trade sector: its resource base, its historical performance and structural changes, the current situation as well as constrains faced by this sector, the growth of the bamboo processing sector. As the first systematic research in this area, it has produced useful and interesting results. This concluding section briefly discusses the major findings of this study and their policy implications.

(1) The remarkable growth of the Chinese bamboo economy

The Chinese bamboo sector has witnessed a historical growth over the last 20 years or so. The total output value of the bamboo sector in 1995 was estimated at the magnitude of 17 billion Yuan (approximately US$ 2 billion at the official exchange rate). With the assumption of moderate annual growth rate of 3-5 per cents in recent years, the output value in 2000 may reach 20 –21 billion Yuan. Bamboo processing products (such as bamboo plaiting products), bamboo shoots and bamboo materials are the three largest categories of products in the Chinese bamboo sector.

Although the rich resource base of bamboo land in China has surely made its contribution, the institutional reform policies initiated in the late 1970s and the early 1980s were of crucial importance to the growth in the Chinese bamboo economy. The market oriented reform policies such as the land reallocation on the basis of farm household (Household Responsibility System), the abolishment of the state monopoly in bamboo purchase and marketing, gave tremendous incentives for the farmers and firms and in turn unleashed the historical process of economic transformation. Modern technology also played an important role in facilitating the growth process.

(2) Consistent statistical codes for China's bamboo trade

Observation of the time series data on the Chinese bamboo external trade is deemly troubled by the complex of different data sources and changes in the statistics collection conventions. Efforts have been made in this study to clarify confusion and problems in this area. As a result, a system of statistical codes consistent over different periods of time since the 1950s has been produced. On the basis of the system, we are able to observe the trade flow data for the Chinese bamboo products in a consistent way.

(3) Historical performance of the Chinese bamboo exports

The available data on the trade flow cover the periods from 1950 to1964 and that from 1981 up to now. The turmoil of the "Cultural Revolution" led to unavailability of the data for the period of 1965-1980. Bamboo played an important role in its export sector since the People's Republic of China was founded in 1949. Value for the export of the bamboo products was US$ 1.28 million in 1950 and reached US$ 3.51 million in 1957. The average export value for bamboo product was about US$ 2.50 million during the period from 1950 to 1964.

China's bamboo exports over the last 20 years or so present 3 distinct pattern in different periods. The first period is from 1981 to 1985 during which the total value of the bamboo product exports fluctuated between US$ 46.1 million to US$ 63.2 million. No growing trend for the total export value was observed during the period.

The second period is from 1986 to 1995 during which the total bamboo product exports experienced remarkable growth. Total export value increased from US$ 47.4

million in 1985 to US$ 369.4 million in 1995, at the average annual growth rate of 22.8 per cent, representing a golden period for the Chinese bamboo in terms of the expansion of bamboo product exports in China.

The third period is from 1996 to 2000 during which the total bamboo product exports experienced dramatic decline and recovery. Total export value declined from US$ 342.6 million in 1995/96 to US$ 252.2 million in 1998/99 with the average annual decreasing rate of 7.9 per cent. In part due to strong recovery of the Asian economies, China's bamboo exports in 2000 increased significantly to an estimated level of about US$ 300 million.

(5) Structural pattern of the Chinese bamboo exports

Of three major bamboo products, exports of bamboo shoots increased dramatically during the last two decades or so. Its share in total bamboo exports increased from less than 10 per cent in the early 1980s to about 50 per cent in recent years. Various bamboo processing (especially plaiting) products are still playing very important role in the Chinese bamboo export sector, although its share in the total export declined substantially in the last 20 years or so. Bamboo materials have kept a relatively steady share of 10 per cent for the total bamboo product exports during the period.

(6) Performance of the Chinese bamboo imports

Total import value of China's bamboo products was kept at low level of less than US$ 0.5 million until 1990. The import value increased dramatically to over US$ 3 million in 1995 but fell drastically to less than US$ 2 million in the following two years. The last three years witnessed strong growth of bamboo imports again with the estimated import value of over US$ 4.5 million in 2000. In spite of the strong growth, China's bamboo imports have still remained a fraction (about 1.5 per cent) of the export value of bamboo products in 2000, revealing an overall comparative advantage assumed by the Chinese bamboo sector.

(7) Destination of the Chinese bamboo exports

The striking change with respect to the destination of the Chinese bamboo exports since the 1980s has been the tremendous increase in the Japan's market share at the expense of Hong Kong's share. In 1981, Japan's market share for China's bamboo product exports was only 7 per cent, similar to that for countries such as US, Italy and UK, far less than that for Hong Kong that took the lion share of 45 per cent then. Japan's share has nevertheless increased throughout the period. The growth accelerated dramatically in the first half of the 1990s during which the Japan's share increased from 19 per cent in 1990 to 53 per cent in 1995 whereas that for Hong Kong declined from 48 per cent to 9 per cent. US and Europe have also been important markets for China's bamboo product exports. The market share of US declined from 9 per cent in 1981 to 4 per cent in 1990, but bounced back to 10 per cent in 1995 and retained the share of 10 per cent in recent years. Italy, UK, France, German and Netherlands have been major European countries as destinations for China's bamboo product exports. In 1998/99, these 5 countries represented 11.7 per cent of market share for China's total bamboo product exports. Finally, Asian economies such as Korea, Taiwan have emerged in recent years as new markets for China's bamboo product exports.

(8) Domestic shipping ports for the Chinese bamboo exports

Distribution of domestic shipping ports for exports of different bamboo products by

China vary greatly. For example, the most important shipping ports for exports of fresh bamboo shoots in recent years are Shanghai, Fuzhou and Hangzhou.etc while those for bamboo plaiting products are the south and east ports such as Shenzhen Guangzhou and Shanghai. Evidence from a survey study indicates Shanghai, Guangzhou are the most important shipping ports. Length of distance as well as transport costs are the most important factors considered by the export firms in choosing the shipping ports.

(9) Evidences from a firm survey investigation

A firm survey has been attempted with a view of gathering information about the industry from the firms' level. Though the survey has limitation in its small sample size etc, it yields useful and important results. For example, the survey results suggest that 71 per cent of the bamboo processing firms surveyed engaged in export activities. Bearing in mind its potential upward bias, the figure indicates strong external linkage of the Chinese bamboo processing sector with the world market. The costs of bamboo material input as the proportion of the total bamboo output value for the survey firms is in average 39 per cent, revealing strong economic linkage of this sector to the forestry and rural economies. Being asked about "the size of your foreign trading partner companies", most of the replied firms (58 per cent) picked up "medium-size" as the answer. The survey also reflects constrains and difficulties currently faced by the Chinese bamboo sector.

(10) Prospects and policy implications

After the remarkable growth in the last 20 years or so, the Chinese bamboo economy has changed its traditional image of "timber of the poor" and become a dynamic sector with substantial linkages with national and international markets. China is likely to join WTO in near future and the Chinese economy will face a more open and more competitive environment. The historical growth of China's bamboo economy has been brought about mainly through three major factors: market oriented and open-up policies, utilization of modern technology as well as rich resources of bamboo land. On the basis of the three-pillars of supporting factors, the Chinese bamboo sector is believed to have great potential of further growth in the new century.

The potential will nevertheless not automatically become a reality. To transfer the potential of comparative advantage assumed by the Chinese bamboo sector into real export expansion, a lot need to be done to sharpen the competitive edge of this sector. Bamboo farmer and firms need to make more vigorous efforts in the areas of technological innovation, quality control and improvement, marketing etc. The Chinese governments also have due roles to play. Apart from continuous implementation of market oriented and open-up policies, more need to be done to reduce unnecessary administrative regulations, relieve the tax and fees burden for the industry, help in prevision of information services and more favorable credit policies to the industry. The future of the Chinese bamboo industry will in all likelihood depend upon efforts of "the collective learning process" participated by the Chinese farmers, firms and governments.

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Figures for "China's Bamboo Product Trade: Performance and Prospects"

Source: "China's customs statistics annual report" 1950-1964

Figure 4.1. China's export and import of bamboo products: 1950-1964

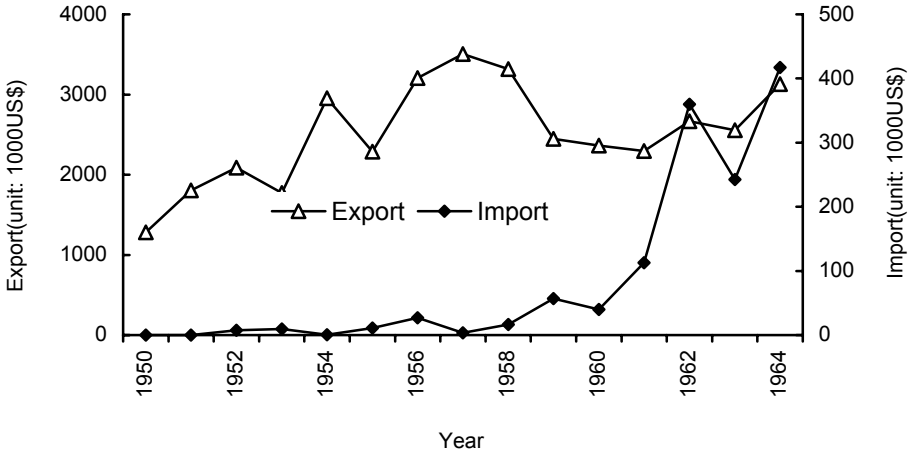
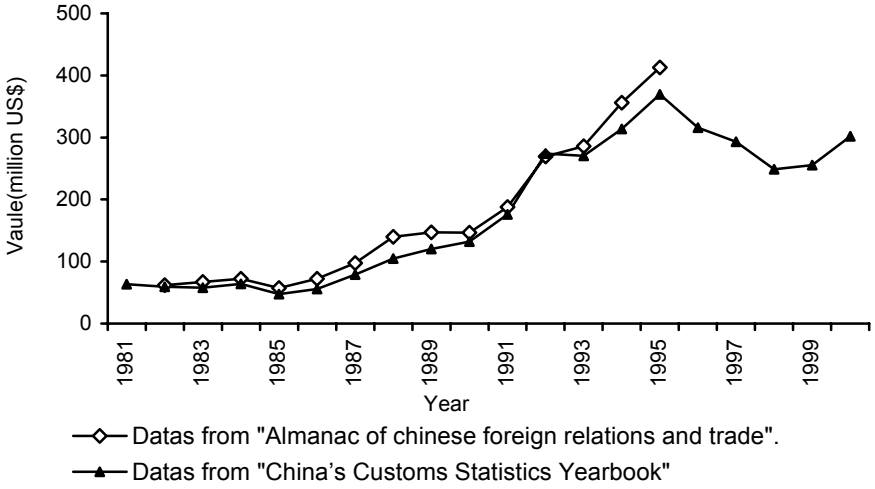
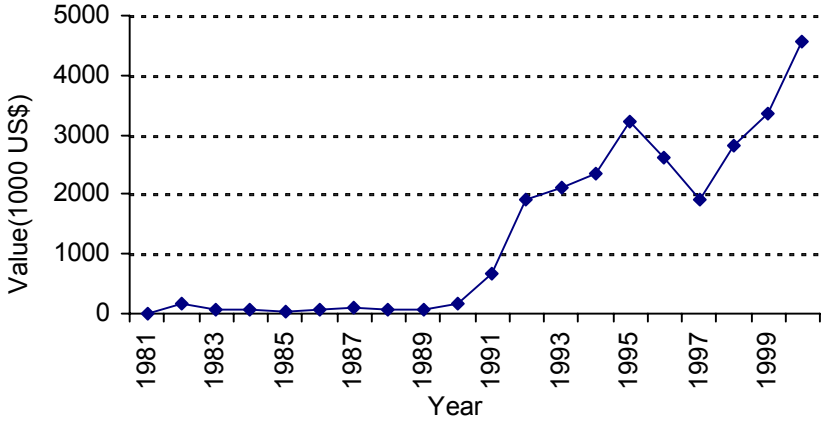


Figure 4.2: China's total export of bamboo products: 1981-2000



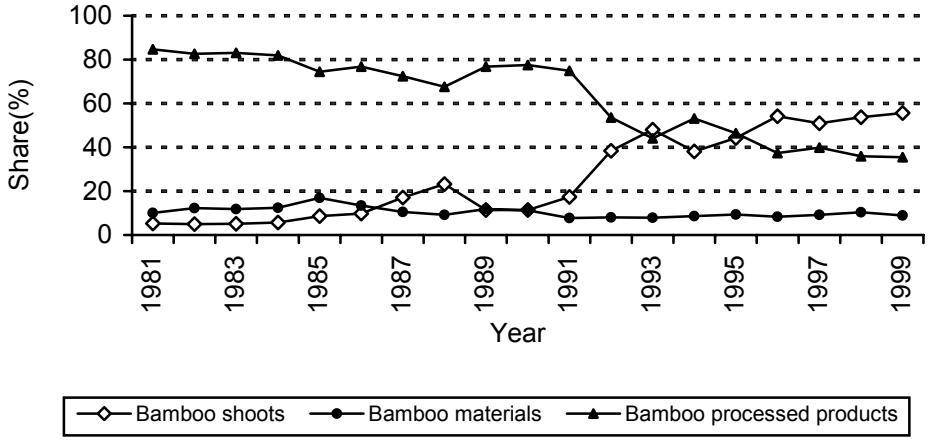
Sources: See Table 4.3.

Figure 4.3: Total value of China's bamboo products import: 1981-2000



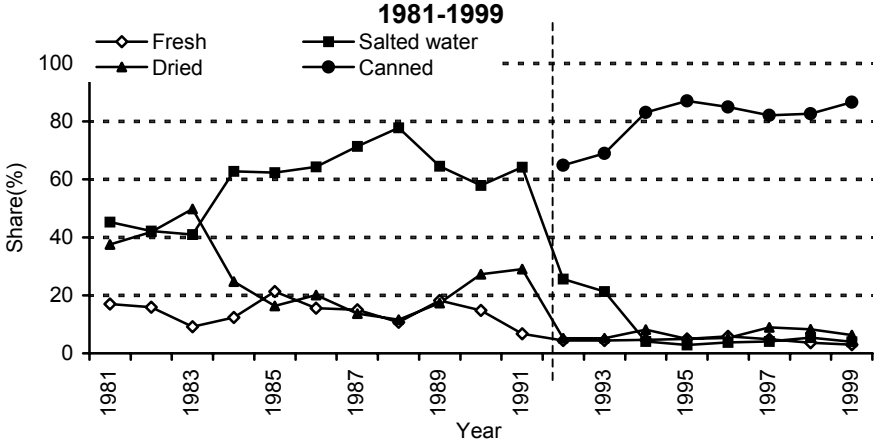
Source: See Table 4.5.

Figure 4.4. Value share of China's major bamboo products export: 1981-1999



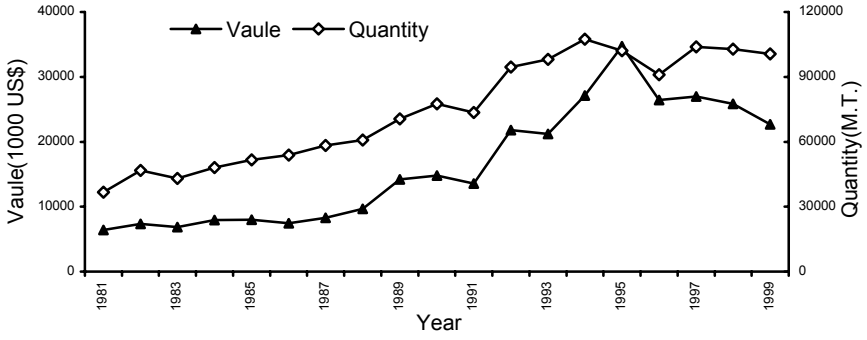
Sources: "Yearbook of the Chinese foreign trade and economy" and "China's customs statistics yearbook"

Figure 4.5. Value share of bamboo shoots products in total exports of bamboo shoots products: 1981-1999



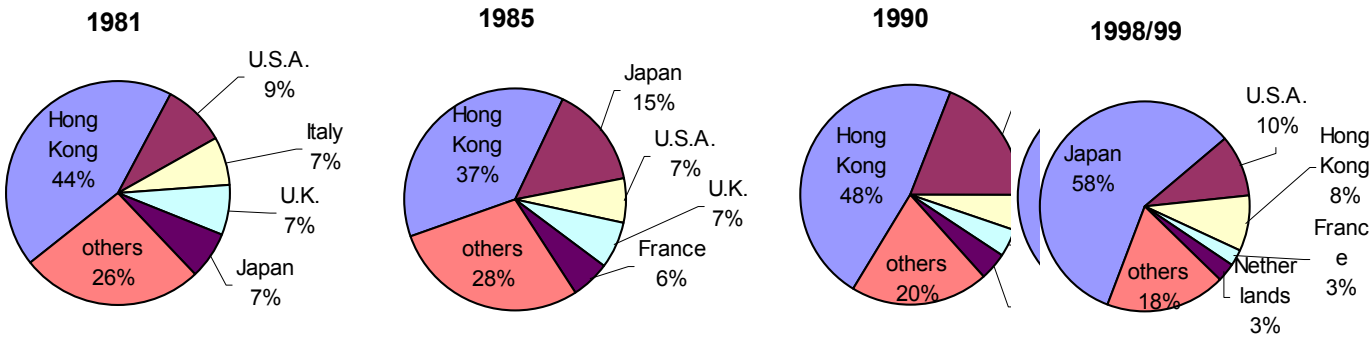
Source: "China's customs statistics yearbook".

Figure 4.6. China's export of bamboo materials: 1981-1999



Source: "China's customs statistics yearbook"

Figure 5.1. Distribution and changes in destination of China's bamboo exports



Source: "China's customs statistics yearbook"

Figure 5.2. Distribution and changes in destination of China's fresh bamboo shoots exports

Source: "China's customs statistics yearbook".

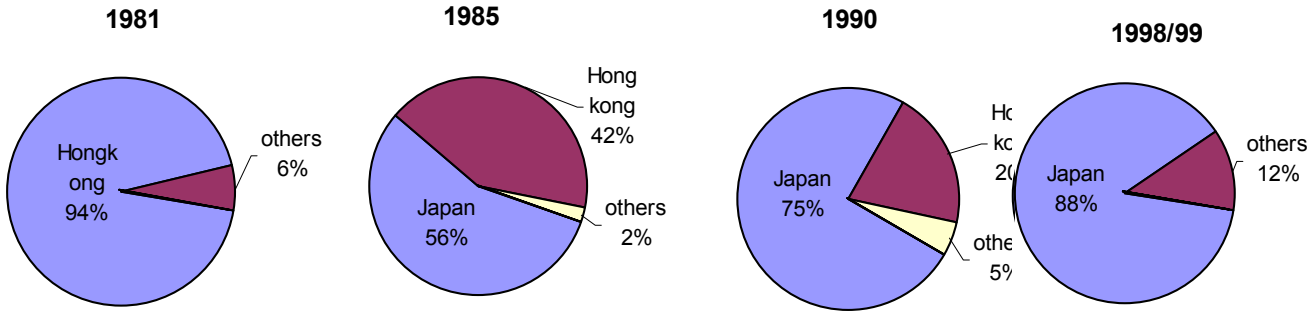
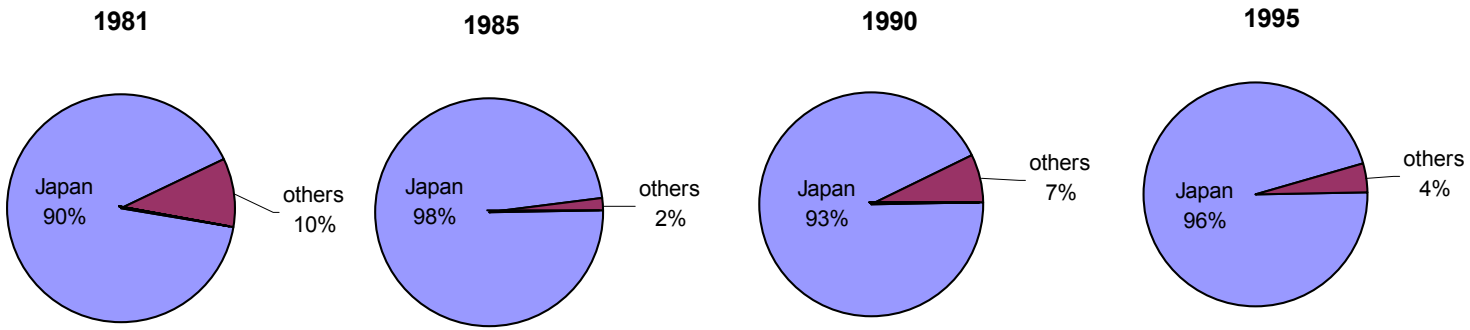


Figure 5.3. Distribution and changes in destination of China's salted water bamboo shoots exports



Source: "China's customs statistics yearbook".

Figure 5.4. Distribution and changes in destination of China's dried bamboo shoots exports
Source: "China's customs statistics yearbook".

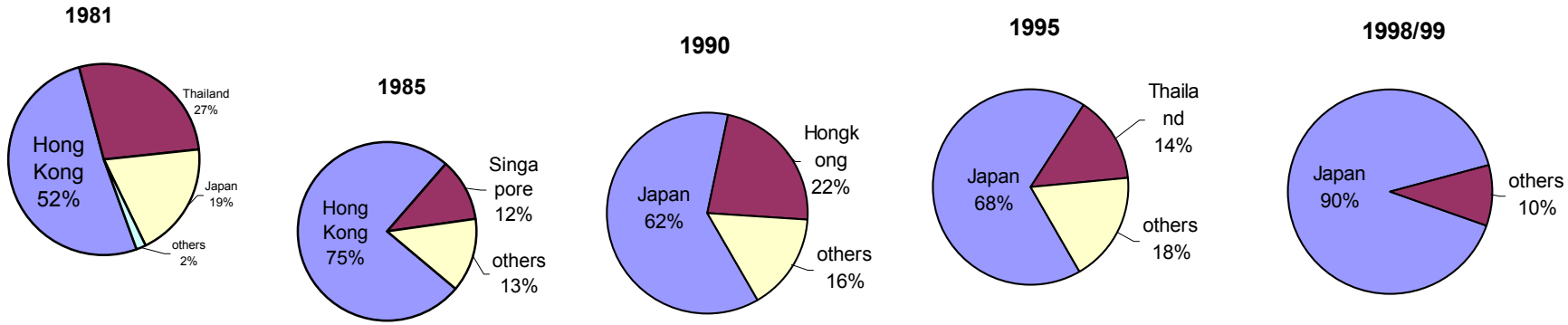
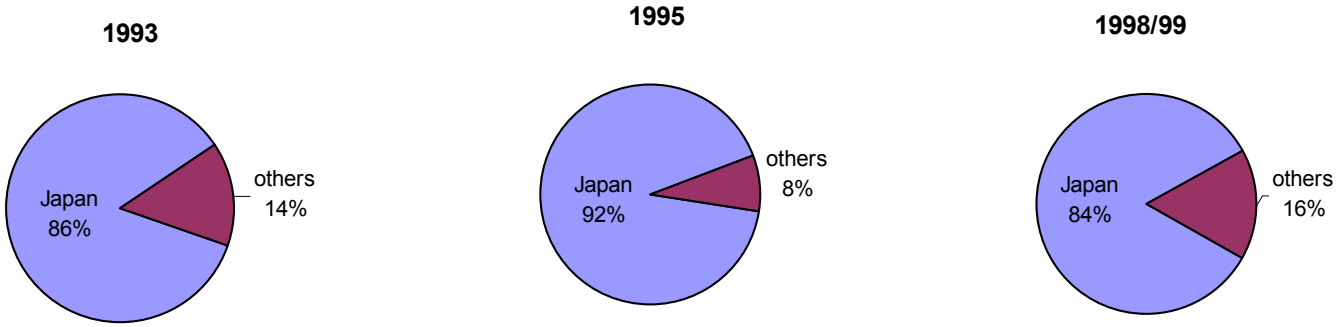
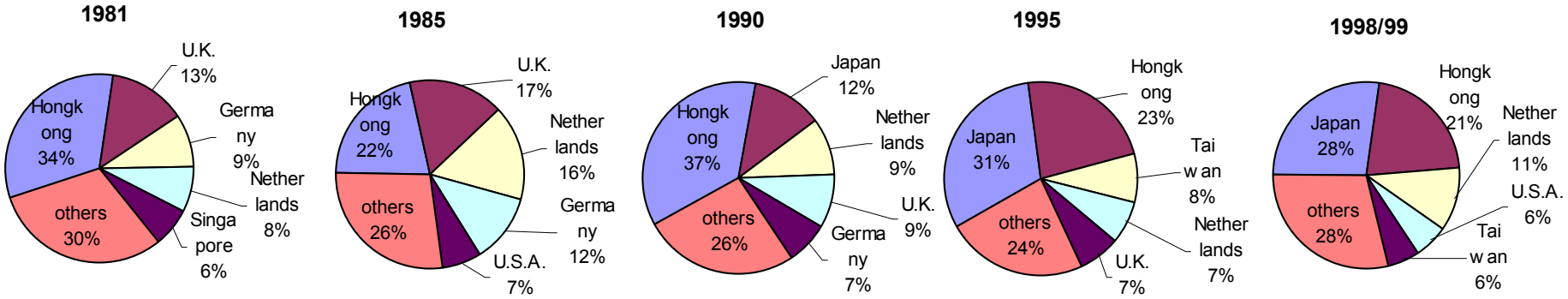


Figure 5.5. Distribution and changes in destination of China's canned bamboo shoots exports



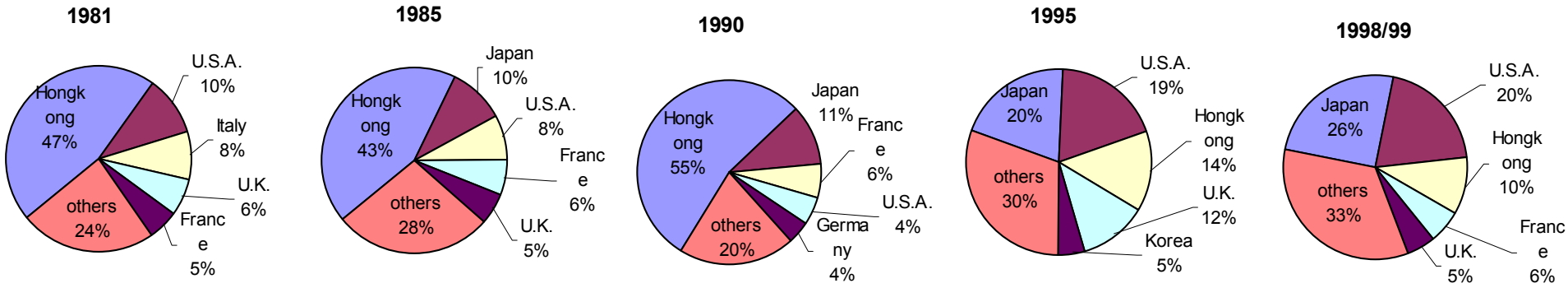
Source: "China's customs statistics yearbook".

Figure 5.6. Distribution and changes in destination of China's bamboo materials exports



Source: "China's customs statistics yearbook".

Figure 5.7. Distribution and changes in destination of China's bamboo plaiting product exports



Source: "China's customs statistics yearbook".

Figure 7.1. Provincial distribution of the survey firms

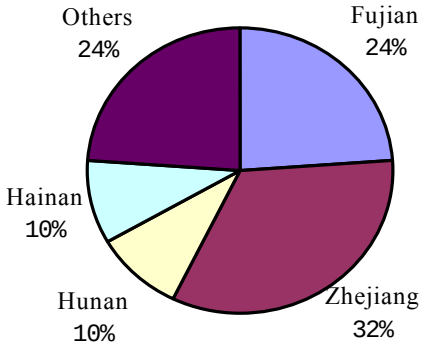


Figure 7.2. Economic category of the survey firms

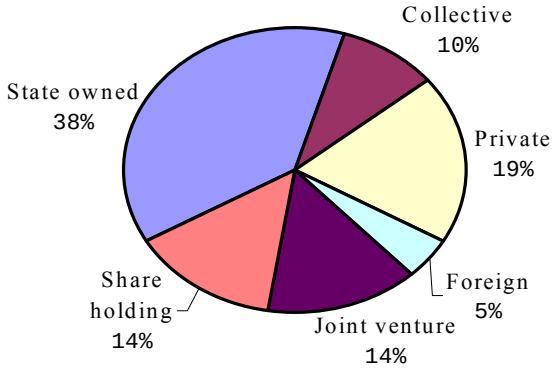


Figure 7.3. Starting time of bamboo processing and

Figure 7.4. Channels of purchasing bamboo raw materials

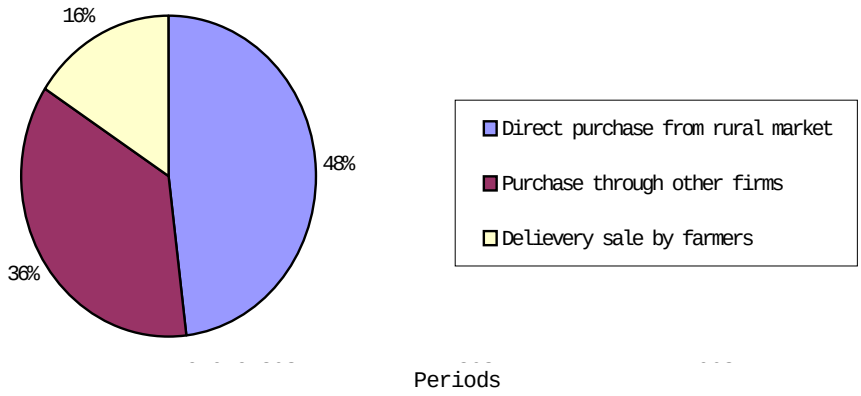


Figure 7.5. Origin sources of bamboo raw materials

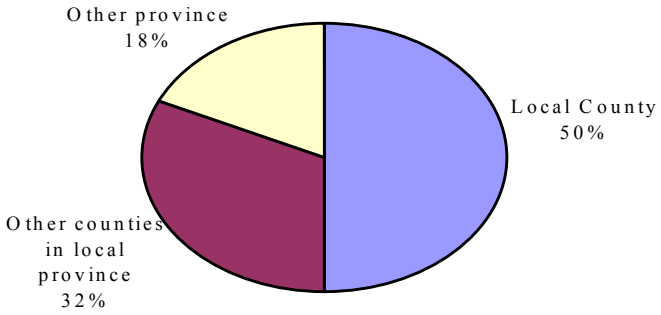
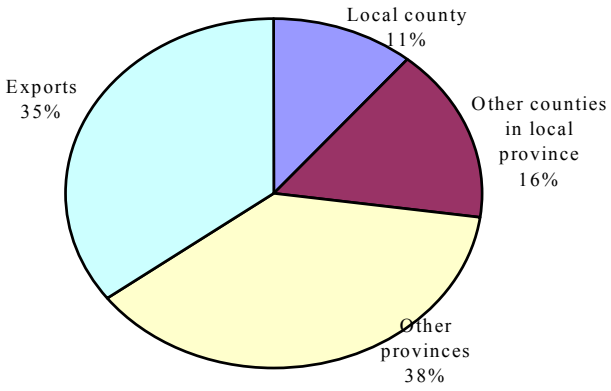


Figure 7.6. Market distribution of bamboo products



Tables for "China's Bamboo Product Trade: Performance and Prospects"

Table 2.1. China's bamboo land and bamboo resources

(10000 ha.; 10000 metric ton)

Period	Total Area of Bamboo Land	Standing Timber Volume	Area of Moso Bamboo Land	Standing Timber Volume	Area of Other Bamboo Land	Standing Timber Volume
1979-81	319.96	6474.6	222.90	5349.6	75.00	1125.0
1984-88	352.36	7628.8	250.37	5997.0	101.99	1631.8
1989-93	379.08	9632.3	260.26	7493.0	118.85	2139.3

Source: Zhong and Liu (1999).
Note: These are the data of the survey on China's forestry resources conducted by MoF.

Table 2.2. Regional distribution of China's bamboo land (100 ha. %)

Provinces & Regions	1979-81		1984-88		1989-93	
	Area	Share	Area	Share	Area	Share
Zhejiang	4802	15.01	4862	13.71	5098	13.08
Anhui	1434	4.48	1764	4.97	2034	5.22
Fujian	5804	18.14	6092	17.18	6807	17.47
Jiangxi	4563	14.26	5340	15.06	5516	14.16
Hubei	829	2.59	1238	3.49	1210	3.11
Hunan	4932	15.41	5220	14.72	6120	15.71
Guangdong	3409	10.65	3166	8.93	3550	9.11
Guangxi	1728	5.40	1632	4.60	2401	6.16
Sichuang	1440	4.50	3421	9.65	3456	8.87
Yunnan	1575	4.92	1439	4.06	1248	3.20
Others	1480	4.63	1052	3.01	468	1.23
Total	31996	100	35236	100	37908	100

Source: Zhong, Xie, Fu and Xie (1995).
Notes: These are the data from the survey on China's forestry resources conducted by MoF. Data of the total area for 1984-88 and 1989-93 in the original source differ from those reported in Table 2.1 and they have been adjusted on the basis of those in Table 2.1.

Table 2.3. Quantity and value of bamboo materials and bamboo shoots
(Selected years from 1980 to 1997; 10000 tons, million yuan)

	Bamboo Materials		Bamboo Shoots		
Year	Quantity	Value	Quantity	Value	Total Value
1980	438.1	344.8	42.0	67.2	412.0
1985	511.5	678.1	46.4	162.5	849.6
1990	727.9	1427.7	83.6	835.5	2263.2
1995	1099.5	5503.6	174.6	2269.3	7772.9
1996	1035.8	5332.0	183.0	2379.6	7711.6
1997	1100.3	5567.5	217.2	3040.9	8608.4
1997 as % of 1980	251.2	1614.7	517.1	4863.2	2137.1

Source: Zhong and Liu (1999).

Table 2.4. Prices for selected bamboo products and general price indexes

Year	Moso Bamboo	Hao Bamboo	Miscellaneous bamboo	Bamboo Shoots	Bamboo paper	Price Index (1978=100)		
	(yuan/plant)		(yuan/ton)	(yuan/kg)	(yuan/ton)	Bamboo	Retail	Farm Products*
1980	0.95	0.4	79.7	0.15	1330	133	108	101
1985	1.67	1.0	162.8	0.30	1587	288	128	111
1990	3.50	2.0	299.2	1.00	2289	484	208	172
1991	4.0	2.5	320.2	1.10	2359	495	214	177
1992	5.3	2.8	400.0	1.20	2430	532	225	183
1993	6.1	3.0	460.0	1.40	2500	591	255	204
1993 as % of 1980	642	750	577	933	188	444	236	202

* It refers “general price index of farm products”.
Sources: Annual prices for selected bamboo products and price index for bamboo products are from Zhong, Xie, Fu and Xie (1995) ,Table 16. The prices for selected bamboo products in 1993 as percentage of that in 1980 are the author’s calculation. Data for the general retail price index and the general price index of farm products are from “China Statistical Yearbook 1998” p. 302.

Table 2.5. Bamboo related activities for firms of village-run, private, cooperative-run and individual-run with annual sales of over 1 million of the Chinese Yuan at the level of township and above the level of township in 1995

Items of Statistics	Number of Firms	Output Value (100 million yuan)	Number of Workers (10000)
Harvesting and transport of Bamboo materials	52	0.87	0.35
Manufacture goods of bamboo, rattan etc.	3045	69.4	17.5
Bamboo and rattan furniture"	411	11.1	61.2

Source: The Office of the Third National Industrial Census (di sanci quanguo pucha bangongshi): "Data compilation for the third national industrial census of the People's Republic of China in 1995: Volume of comprehensiveness and sectors (Zhonghua renmin gongheguo 1995 nian di sanci quanguo gongye pucha ziliao huibian: zonghe.hangye juan), pp. 8-11; China Statistics Press (Zhongguo tongji chubanshe), Beijing 1997.

Table 2.6. Bamboo related activities for firms of village-run, private, cooperative-run and individual-run with annual sales of over 1 million of the Chinese Yuan in 1995

Items of Statistics	Number of Firms	Output Value (100 million yuan)	Number of Workers (10000)
Harvesting and transport of Bamboo materials	15	0.31	0.09
Manufacture goods of bamboo, rattan etc.	978	31.5	6.62
Bamboo and rattan furniture"	106	3.30	0.58

Source: The Office of the Third National Industrial Census (di sanci quanguo pucha bangongshi): "Data compilation for the third national industrial census of the People's Republic of China in 1995: Volume of comprehensiveness and sectors (Zhonghua renmin gongheguo 1995 nian di sanci quanguo gongye pucha ziliao huibian: zonghe.hangye juan), pp. 32-35; China Statistics Press (Zhongguo tongji chubanshe), Beijing 1997.

Table 2.7. Estimated annual output values for the Chinese bamboo processing sector in the mid-1990s.
(100 million yuan)

Items	Output Value	Proportion (%)
Bamboo manufactured commodities	64.7	67.5
In which:		
Bamboo mat	33.6	35.1
Man-made bamboo plank	12.0	12.5
Bamboo flooring	5.4*	5.6
Bamboo paper	14.0	14.6
Processed bamboo shoots	17.1	17.9
Total	95.8	100.0

Source: Zhong and Liu (1999).
*It is misprinted as 5400 million yuan in the cited reference.

Table 3.1. China's statistical codes for bamboo product trade introduced in 1951

Items	**Code**
Bamboo pole	261
With diameter exceeding 25cm	26110
With diameter less than 25cm	26120
Bamboo parcel, skin, eaves etc.	262
Bamboo parcel, skin	26210
Others	26220
Bamboo products	263
Bamboo mat	26310
Bamboo cable	26321
Others	26330

Source□"China's Customs Statistics Annual Report" (1950-1951)

Table 3.2. China's Statistical codes for bamboo product trade: 1954-1964

Items	1952•53	1954•58	1959•64
Fresh bamboo shoots	46010116	46010116	n.a.s.i
Trace of bamboo shoots	46010508	46010508	n.a.s.i
Bamboo materials	3006	3006	3006
Bamboo	300601	300601	300601
Li bamboo	3006011	3006011	3006011
Meso bamboo	3006012	n.a.s.i	n.a.s.i
Other bamboos	30060199	30060199	30060199
Bamboo parcel, siik, $ semi-processed products	300602	300602	300602
Bamboo manufactured products	6007	6007	6007

Notes: "n.a.s.i" stands for "not available as a separate item".
Source: "China's Customs Statistics Annual Report" (1952-1964).

Table 3.3. Changes in statistical codes for bamboo product trade since 1981

Items	1981-91	1992-96	1997 to now
Fresh bamboo shoots	54594	07099010	07099010
Salted water bamboo shoots	54622	07119020	07119031
Dried bamboo shoots	5615	07129010	07129010
Canned bamboo shoots	n.a.s.i.	20059030	n.a.s.i.
Whose with volume exceeding 8 liters	n.a.s.i.	n.a.s.i.	20059031
Other canned bamboo shoots	n.a.s.i.	n.a.s.i.	20059039
Bamboo materials	29235	14011000	14011000
Bamboo plaiting products	899711	46021030	46021030
Furniture made of rattan, bamboo & similar materials	n.a.s.i.	94038010	94038010
Bamboo furniture	821933	n.a.s.i.	n.a.s.i.
Wood & bamboo carvings	635492	44201010	44201010
Seats made of rattan, bamboo & similar materials	n.a.s.i.	94015000	94015000

Notes: "n.a.s.i" stands for "not available as a separate item".
Source: "China's Customs Statistics Annual Report" (1981-1989)
"China's Customs Statistics Yearbook" (1990-1999).

Table 3.4. Statistical coverage for bamboo products and its changes in "Almanac of the Chinese Foreign Economic Relations and Trade "

Items	Periods with Data Availability
Winter bamboo shoots	From 1982 to 1995□n.a. since 1996
Dried bamboo shoots	From 1982 to now
Salted water bamboo shoots	From 1982 to 1984•n.a. since 1985
Water bamboo shooots	From 1984 to 1995•n.a. since 1996
Wild bamboo bongus	From 1982 to 1995•n.a. since1996
Bamboo leaves	From 1982 to 1995•n.a. since1996
Meso bamboo	From 1982 to 1995•n.a. since1996
Gao bamboo	From 1982 to 1995•n.a. since1996
Li bamboo	From 1982 to 1995•n.a. since1996
Other bamboo	From 1982 to 1995•n.a. since1996
Hand-made paper	From 1982 to now
Bamboo wares and manufactures	From 1982 to 1995•n.a. since1996
Bamboo-braided fans	From 1982 to 1995•n.a. since1996
Bamboo comb	From 1982 to 1995•n.a. since1996
Bamboo carvings	From 1982 to 1995•n.a. since1996
Bamboo plaited goods	From 1982 to 1984•n.a. since 1985
Bamboo processed products	From 1982 to now

Source: "Almanac of Chinese Foreign Economic Relations and Trade ".

Table 4. 1. China's exports of bamboo products: 1950-1964

(Unit: US$ million)

Items & Codes	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Bamboo materials (3006)	0.35	0.83	1.30	1.22	2.26	1.61	2.47	2.63	2.42	1.83	1.78	1.65	2.03	1.91	2.34
Bamboo (300601)	0.23	0.54	0.74	0.70	1.74	1.09	1.90	2.07	1.94	1.30	1.28	1.07	1.36	1.24	1.66
Li bamboo (30060101)			0.51	0.47	1.45	0.84	1.55	1.83	1.71	1.04	1.08	0.80	1.03	0.94	1.33
Other bamboo (30060199)			0.08	0.08	0.08	0.25	0.35	0.23	0.23	0.26	0.20	0.27	0.32	0.30	0.33
Bamboo parcel, skin etc. (300602)	0.12	0.29	0.56	0.52	0.52	0.52	0.56	0.56	0.48	0.53	0.49	0.58	0.67	0.67	0.68
Bamboo products (6007)	0.80	0.98	0.59	0.48	0.44	0.45	0.51	0.50	0.50	0.62	0.59	0.65	0.64	0.65	0.79
Winter bamboo shoots (46010116)	0.13				0.11	0.12	0.13	0.19	0.13						
Dried bamboo shoots (46010508)			0.20	0.07	0.14	0.11	0.10	0.19	0.27						
Total	1.28	1.81	2.09	1.77	2.96	2.29	3.21	3.51	3.32	2.45	2.36	2.30	2.67	2.56	3.13

Notes: The statistical code system introduced in 1954 has been used to present the data in this table. Data in 1951-53 have been adjusted on the basis of the code system to make the data in different years comparable. The original data are reported in Renmenbi and converted into US dollar using exchange rates of Renminbi reported in various volumes of "Chinas customs statistics annul report".

Source□"China's Customs Statistics Annual Report" (1950-1964).

Table 4.2. China's imports of bamboo products: 1950-1964:
(Unit: US$ 10,000)

Items & Codes	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Bamboo materials (3006)			0.68	0.92	0.02		0.12	0.06	1.27	5.45	3.89	8.66	32.07	15.30	38.13
Bamboo (300601)			0.68	0.92	0.02		0.12	0.06	0.43	3.26	1.82	7.01	31.16	14.37	36.59
Li bamboo (30060101)															
Other bamboo (30060199)							0.12	0.06	0.43	3.26	1.82	7.01	31.16	14.37	36.59
Bamboo parcel, skin etc. (300602)									0.85	2.18	2.08	1.66	0.91	0.94	1.53
Bamboo products (6007)	0.01					1.04	0.26	0.09	0.15	2.28	0.12	2.61	3.92	8.94	3.60
Winter bamboo shoots (46010116)															
Dried bamboo shoots (46010508)			0.05	0.02	0.03	0.06	2.33	0.20	0.21						
Total	0.01	0.01	0.74	0.93	0.05	1.10	2.72	0.35	1.64	5.68	4.01	11.28	35.99	24.24	41.73

Notes: The statistical code system introduced in 1954 has been used to present the data in this table. Data in 1951-53 have been adjusted on the basis of the code system to make the data in different years comparable. The original data are reported in Renmenbi and converted into US dollar using exchange rates of Renminbi reported in various volumes of "Chinas customs statistics annul report".
Source□"China's Customs Statistics Annual Report" (1950-1964).

Table 4. 3. China's exports of bamboo products: 1981-2000
(Unit: US$ million)

Year	Fresh bamboo shoots (1)	Salted water bamboo shoots (2)	Dried bamboo shoots (3)	Canned bamboo shoots (4)	Bamboo Materials (5)	Bamboo plaiting Products (6)	Bamboo carvings (7)	Bamboo Furniture (8)	Bamboo fans (9)	Bamboo combs (10)	Total
1981	0.57	1.51	1.25		6.40	52.99		0.50			63.22
1982	0.47	1.25	1.25		7.33	46.43	0.58	0.30	1.08	0.76	59.46
1983	0.27	1.21	1.47		6.84	46.28	0.38	0.08	0.89	0.50	57.92
1984	0.45	2.29	0.90		7.94	50.82	0.17	0.16	0.56	0.85	64.15
1985	0.88	2.56	0.67		7.99	33.82	0.11	0.06	0.61	0.69	47.39
1986	0.85	3.52	1.10		7.47	40.73	0.10	0.44	0.88	0.56	55.66
1987	2.01	9.57	1.83		8.31	55.16	0.09	0.06	1.16	0.64	78.83
1988	2.59	18.84	2.80		9.66	67.51	0.29	0.12	2.13	0.69	104.63
1989	2.48	8.80	2.36		14.19	89.04	0.21	0.14	1.94	0.95	120.11
1990	2.22	8.65	4.08		14.82	99.62	0.25	0.28	1.37	0.72	132.00
1991	2.07	19.64	8.89		13.57	128.96	0.27	0.09	1.52	0.79	175.80
1992	4.60	26.90	5.42	68.21	21.82	144.57	0.73		0.86	0.64	273.76
1993	5.77	27.76	6.80	89.69	21.22	116.31	0.12	0.14	1.44	1.39	270.63
1994	5.55	4.95	9.74	99.36	27.14	162.80	1.28	0.32	1.60	0.85	313.58
1995	8.19	4.74	8.17	142.30	34.73	164.30	1.08	0.35	1.71	3.81	369.37
1996	10.04	6.47	9.16	145.55	26.41	115.39	0.34	0.22	1.16	1.17	315.92
1997	7.24	6.05	13.41	122.62	26.99	114.11	0.39	0.17	1.15	1.16	293.28
1998	4.84	7.21	11.14	110.38	25.85	87.09	0.33	0.12	0.88	0.88	248.73
1999	4.29	5.71	8.99	123.28	22.68	88.43	0.26	0.23	0.89	0.90	255.66
2000	5.06	5.72	9.07	137.15	22.98	119.00	0.30	0.28	1.20	1.21	301.96

Sources and notes□
(1) Data on items of bamboo shoots, bamboo materials and bamboo plaiting products (items 1-6 in the Table) during the period 1981-98 are from "China's Customs Statistics Yearbook" (1981-1998). The data on these items for 1999 are purchased from The Customs General Administration of China.
(2) Data on " bamboo carvings" for the period of 1982-95 are from "Almanac of Chinese Foreign Economic Relations and Trade". The data for 1996-99 are estimated using the firuges of on "carvings of wood and bamboo" reported in "China's Customs Statistics Yearbooks" for the period and the figures on proportion of "bamboo carvings" to total "carvings of wood or bamboo" for the period of 1991-95 are calculated through using the relavant data in "Almanac of Chinese Economic Relations and Trade".
(3) Data on bamboo furniture for the period from 1981-91 are directly quoted from various volumes of "China's Customs Statistics Yearbook". The data from 1992 are estimated using figures on "furniture and seats made of rattan, bamboo or similar materials" in recent volumes of "China's Customs Statistics Yearbook" and a assumption that proportion of bamboo furniture and seats is equal to that of bamboo furniture in total bamboo and wood furniture during the period of 1988-91.
(4) Data on bamboo comb and bamboo fans for the period of 1982-95 are directly quoted from "Almanac of Chinese Foreign Economic Relations and Trade". The data from 1996 are estimated using figures on "bamboo processed products" (including bamboo plating products, carvings of bamboo, furniture of bamboo, bamboo comb and bamboo fans) and a assumption that proportion of bamboo comb and bamboo fans in total bamboo processed products in the recent years equals to that during 1991-95.
(5) Data for 2000 is estimated using the real figures for the period from January to November in 2000 divided by the average proportion of the export value for the first 11-month in total annual export value for 1997-1999.

Table 4. 4. China's exports of bamboo products in "Almanac of Chinese foreign economic relations and trade": 1982-1995
(Unit: US$ million)

Item	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Winter bamboo shoots	0.38	0.25	0.33	0.64	0.87	1.54	2.23	2.57	1.52	2.61	3.05	3	4.84	7.89
Dried bamboo shoots	1.07	1.65	0.73	0.55	0.77	0.85	1.44	1.53	2.74	3.23	2.85	3.84	4.82	9.41
Salted water bamboo shoots	2.23	3.95	6.27											
Water bamboo shoots			6.27	5.76	8.98	21.59	47.53	40.11	32.68	49.6	101.01	124.88	113.34	139.37
Wild bamboo bongus	0.19	0.14	0.23											
Bamboo leaves	0.5	0.4	0.3	0.38	0.49	0.45	0.56	0.35	0.56	0.12	1.4	0.93	0.97	1.01
Mao bamboo	0.2	0.14	0.21	0.16	0.17	0.17	0.17	0.14	0.61	0.63	0.91	1.48	1.24	0.73
Gao bamboo	1.72	1.22	1.39	0.92	1.43	1.05	1.25	0.86	2.25	2.43	2.34	1.24	2.03	1.16
Li bamboo	3.09	3.77	4.18	4.19	3.73	4.4	4.63	6.98	5.37	2.59	3.01	3.49	3.77	5.71
Other bamboo	0.22	0.18	0.17	0.36	0.25	0.42	0.32	0.45	0.3	0.65	0.79	0.65	1.01	0.18
bamboo wares and manufactures	33.27	38.54	40.81	29.61	38.97	45.05	54.99	62.96	63.58	81.98	103.79	96.52	157.86	171.89
Bamboo-braided fans	1.08	0.89	0.56	0.61	0.88	1.16	2.13	1.94	1.37	1.52	0.86	1.44	1.6	1.71
Bamboo comb	0.76	0.5	0.85	0.69	0.56	0.64	0.69	0.95	0.72	0.79	0.64	1.39	0.85	3.81
Bamboo carvings	0.58	0.38	0.17	0.11	0.1	0.09	0.29	0.21	0.25	0.27	0.73	0.12	1.28	1.08
Bamboo plaited articles	15.47	13.74	15.13											
Bamboo products	1.32	1.22	16.05	13.14	14.88	19.92	23.79	27.83	34.82	41.15	47.75	46.64	62.53	68.71
Total	62.08	66.97	72.25	57.12	72.08	97.33	140.02	146.88	146.77	187.57	269.13	285.62	356.14	412.66

Source: "Almanac of China's Foreign Economic Relations and Trade" (1984-1999/2000).

Table 4.5. China's imports of bamboo products: 1981-1998

(Unit: US$ million)

Year	Fresh Bamboo Shoots	Salted Water Bamboo Shoots	Dried Bamboo Shoots	Canned Bamboo Shoots	Bamboo Materials	Bamboo Plaiting Products	Total
1981							0.01
1982					0.14	0.02	0.16
1983			0.01		0.05		0.07
1984			0.03				0.05
1985			0.02				0.04
1986	0.01		0.03			0.01	0.06
1987	0.01				0.06	0.03	0.10
1988	0.01				0.02	0.03	0.06
1989			0.01		0.01	0.06	0.08
1990					0.06	0.08	0.16
1991					0.58	0.07	0.66
1992				0.01	1.43	0.49	1.93
1993	0.04			0.01	1.72	0.34	2.11
1994	0.06				2.11	0.18	2.36
1995	0.03		0.02	0.71	1.75	0.69	3.21
1996		0.02			2.50	0.11	2.63
1997		0.06		0.06	1.69	0.10	1.90
1998		0.21	0.02	0.04	2.45	0.10	2.83
1999		0.21		0.05	2.98	0.11	3.34
2000		0.25		0.03	4.12	0.15	4.56

Notes: The entries with blank space indicate either no data available or value less than US$ 500. Data for 2000 is estimated using the real figures for the period from January to November in 2000 multiplied by a coefficient of 12/11.

Source: The Customs General Administration of China..

Table 4-6. China's exports of major bamboo shoots products (1981-99)

(Units: 1000 tons; US$ million)

	Fresh		Salted water		Dried		Canned		Total
Year	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Value
1981	1.36	0.57	3.01	1.51	0.34	1.25			3.33
1982	1.30	0.47	3.06	1.25	0.42	1.25			2.97
1983	0.91	0.27	2.61	1.21	0.55	1.47			2.95
1984	0.67	0.45	3.40	2.29	0.35	0.90			3.65
1985	1.40	0.88	3.75	2.56	0.32	0.67			4.11
1986	1.31	0.85	4.86	3.52	0.47	1.10			5.48
1987	2.79	2.01	11.56	95.70	0.71	1.83			13.41
1988	2.26	2.59	14.29	18.84	0.91	2.80			24.23
1989	2.14	2.48	12.19	8.80	0.81	2.36			13.64
1990	2.50	2.22	9.80	8.65	1.11	4.08			14.94
1991	2.16	2.07	19.70	19.640	1.87	8.89			30.60
1992	3.99	4.60	23.17	26.90	1.45	5.42	65.34	68.21	105.13
1993	4.02	5.77	21.50	27.76	1.86	6.80	77.76	89.69	130.02
1994	4.49	5.55	6.23	4.95	2.22	9.74	84.33	99.36	119.59
1995	5.17	8.19	6.47	4.74	2.19	8.17	120.23	142.30	163.39
1996	6.44	10.04	7.88	6.47	2.61	9.16	137.46	145.55	171.22
1997	5.08	7.24	7.21	6.50	2.67	13.41	115.20	122.62	149.32
1998	3.75	4.84	8.43	7.21	2.47	11.13	126.95	110.38	133.56
1999	3.72	4.29	7.01	5.71	2.65	8.99	139.30	123.28	142.27

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 4.8. China's exports of major bamboo processed products (1981-99)

(Unit: US$ million)

Year	Bamboo plaiting product	Carvings of bamboo	Furniture of bamboo	Bamboo fans	Bamboo combs	Total
1981	52.99		0.50			53.49
1982	46.43	0.58	0.30	1.08	0.76	49.15
1983	46.28	0.38	0.08	0.89	0.50	48.14
1984	50.82	0.17	0.16	0.56	0.85	52.56
1985	33.82	0.11	0.06	0.61	0.69	35.29
1986	40.73	0.10	0.44	0.88	0.56	42.71
1987	55.16	0.09	0.06	1.16	0.64	57.11
1988	67.51	0.29	0.12	2.13	0.69	70.74
1989	89.04	0.21	0.14	1.94	0.95	92.28
1990	99.62	0.25	0.28	1.37	0.72	102.24
1991	128.96	0.27	0.09	1.52	0.79	131.63
1992	144.57	0.73		0.860	0.64	146.80
1993	116.31	0.12	0.14	1.44	1.39	119.39
1994	162.80	1.28	0.32	1.60	0.85	166.85
1995	164.30	1.08	0.35	1.71	3.81	171.25
1996	115.39	0.34	0.22	1.16	1.17	118.28
1997	114.11	0.39	0.17	1.15	1.16	116.97
1998	87.09	0.33	0.12	0.87	0.88	89.31
1999	88.43	0.26	0.23	0.89	0.90	90.71

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 4.8. China's exports of bamboo materials (1981-99)

(Units: 1000 tons; US$ million)

Year	Quantity	Value	Year	Quantity	Value
1981	36.68	6.40	1991	73.57	13.57
1982	46.72	7.33	1992	94.61	21.82
1983	43.02	6.84	1993	98.08	21.22
1984	48.02	7.94	1994	107.38	27.14
1985	51.62	7.99	1995	102.05	34.73
1986	53.89	7.47	1996	91.02	26.41
1987	58.36	8.31	1997	103.90	26.99
1988	60.83	9.66	1998	102.79	25.85
1989	70.54	14.19	1999	100.66	22.68
1990	77.55	14.82			

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.1. Distribution and changes in destination of China's bamboo exports
(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Hong Kong	27.90	Hong Kong	17.32	Hong Kong	62.24	Japan	192.23	Japan	145.81
U.S.A.	5.75	Japan	6.79	Japan	24.56	U.S.A.	34.82	U.S.A.	24.29
Italy	4.53	U.S.A.	3.11	France	6.86	Hong Kong	34.27	Hong Kong	20.96
U.K.	4.35	U.K.	3.08	Germany	5.00	U.K.	21.82	France	6.41
Japan	4.26	France	2.56	U.S.A.	4.99	Korea	9.44	Netherlands	6.41
France	3.36	Germany	2.23	Netherlands	4.20	Netherlands	8.97	U.K.	6.18
Germany	2.61	Netherlands	1.80	U.K.	4.13	Germany	7.70	Germany	5.29
Spain	1.53	Italy	1.54	Italy	2.91	France	7.68	Italy	4.88
Belgium	1.10	Belgium	1.16	Belgium	2.81	Taiwan	6.95	Taiwan	4.20
Australia	1.05	Singapore	0.84	Spain	2.39	Italy	6.41	Korea	3.17
Others	6.78	Others	5.55	Others	9.56	Others	32.14	Others	22.35
Total	63.22	Total	45.98	Total	129.66	Total	362.42	Total	249.95

Notes: The statistical coverage in 1980, 1985 and 1990 includes fresh bamboo shoots, salted water bamboo shoots, dried bamboo shoots, canned bamboo shoots, bamboo materials, plaiting products and bamboo furniture while that for 1995 and 1998/99 do not include bamboo furniture.
Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.2 Distribution and changes in destination of China's fresh bamboo shoots exports
(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Hong Kong	0.53	Japan	0.49	Japan	1.66	Japan	7.65	Japan	4.02
Japan	0.03	Hong Kong	0.37	Hong Kong	0.45	Hong Kong	0.35	Hong Kong	0.23
		U.S.A.	0.01	Netherlands	0.10	Netherlands	0.05	U.S.A.	0.18
						U.K.	0.03	Vietnam	0.03
						U.S.A.	0.03	Taiwan	0.02
Others	0.01	Others	0.01	Others	0.01	Others	0.08	Others	0.09
Total	0.57	Total	0.88	Total	2.22	Total	8.19	Total	4.57

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.3. Distribution and changes in destination of China's salted water bamboo shoots exports

(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Japan	1.36	Japan	25.17	Japan	8.06	Japan	4.55	Japan	5.05
Hong Kong	0.12	Hong Kong	0.04	Hong Kong	0.48	Hong Kong	0.12	Taiwan	1.01
Germany	0.01			Germany	0.09	Korea	0.03	Hong Kong	0.23
				Taiwan	0.01	U.S.A.	0.02	Thailand	0.05
						Vietnam	0.01	Vietnam	0.04
Others	0.02	Others	0.42	Others	0.01	Others	0.01	Others	0.08
Total	1.51	Total	25.63	Total	8.65	Total	4.74	Total	6.46

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.4. Distribution and changes in destination of China's dried bamboo shoots exports

(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Hong Kong	0.64	Hong Kong	0.51	Japan	2.52	Japan	5.56	Japan	9.08
Thailand	0.34	Singapore	0.08	Hong Kong	0.91	Thailand	1.18	Thailand	0.42
Japan	0.24	Japan	0.06	Thailand	0.49	Hong Kong	0.62	Hong Kong	0.29
Singapore	0.02	Malaysia	0.03	Malaysia	0.09	Germany	0.16	U.S.A.	0.08
				Singapore	0.05	Korea	0.12	Taiwan	0.05
Others	0.01	Others	0	Others	0.02	Others	0.53	Others	0.14
Total	1.25	Total	0.68	Total	4.08	Total	8.17	Total	10.06

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.5. Distribution and changes in destination of China's canned bamboo shoots exports

(Unit: US$ million)

1993		1995		1998/99	
Japan	76.69	Japan	130.46	Japan	98.29
Hong Kong	6.25	Hong Kong	2.56	Hong Kong	6.31
U.S.A.	1.52	U.S.A.	2.01	U.S.A.	5.12
Taiwan	0.99	Taiwan	1.91	Germany	0.92
Singapore	0.89	Korea	1.01	Korea	0.83
Others	3.35	Others	4.35	Others	5.36
Total	89.69	Total	142.30	Total	116.83

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.6. Distribution and changes in destination of China's bamboo materials exports

(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Hong Kong	2.14	Hong Kong	1.74	Hong Kong	5.44	Japan	10.92	Japan	6.68
U.K.	0.84	U.K.	1.33	Japan	1.78	Hong Kong	8.03	Hong Kong	5.19
Germany	0.58	Netherlands	1.29	Netherlands	1.40	Taiwan	2.68	Netherlands	2.61
Netherlands	0.49	Germany	0.93	U.K.	1.32	Netherlands	2.51	U.S.A.	1.44
Singapore	0.41	U.S.A.	0.52	Germany	1.00	U.K.	2.41	Taiwan	1.35
Others	1.94	Others	2.18	Others	3.88	Others	8.18	Others	7.01
Total	6.40	Total	7.99	Total	14.82	Total	34.73	Total	24.26

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 5.7. Distribution and changes in destination of China's bamboo plaiting product exports

(Unit: US$ million)

1981		1985		1990		1995		1998/99	
Hong Kong	24.40	Hong Kong	14.66	Hong Kong	54.77	Japan	33.10	Japan	22.70
U.S.A.	5.49	Japan	3.40	Japan	10.53	U.S.A.	31.39	U.S.A.	17.46
Italy	4.40	U.S.A.	2.58	France	5.91	Hong Kong	22.59	Hong Kong	8.72
U.K.	3.35	France	2.10	U.S.A.	4.48	U.K.	19.19	France	4.96
France	2.89	U.K.	1.76	Germany	3.91	Korea	7.99	U.K.	4.49
Others	12.45	Others	9.32	Others	20.02	Others	50.03	Others	29.44
Total	52.99	Total	33.82	Total	99.62	Total	164.30	Total	87.76

Source□Data are from "China's Customs Statistics Yearbook" (1981-1998) except those for 1999 are purchased from The Customs General Administration of China.

Table 6.1. Shipping ports for China's bamboo shoots exports: 1997-99

(Unit: Quantity in 1000 tons)

1997			1998			1999		
Customs	**Quantity**	**Share**	**Customs**	**Quantity**	**Share**	**Customs**	**Quantity**	**Share**
Fresh bamboo shoots								
Shanghai	1.79	35.3%	Shanghai	1.77	47.3%	Shanghai	2.19	59.0%
Fuzhou	0.91	17.9%	Ningbo	0.53	14.1%	Fuzhou	0.46	12.4%
Hangzhou	0.75	14.8%	Hangzhou	0.42	11.3%	Huangpu	0.30	8.0%
Ningbo	0.43	8.5%	Fuzhou	0.39	10.5%	Guangzhou	0.28	7.5%
Shenzhen	0.40	7.9%	Huangp	0.22	5.9%	Shenzhen	0.13	3.5%
Others	0.79	15.5%	Others	0.41	10.9%	Others	0.36	9.6%
Total	5.08	100.0%	Total	3.75	100.0%	Total	3.72	100.0%
Salted-water bamboo shoots								
Tianjin	2.85	39.6%	Tianjin	3.29	39.0%	Tianjin	1.80	25.7%
Huangpu	1.32	18.3%	Huangpu	1.53	18.1%	Huangpu	1.48	21.1%
Guangzhou	0.96	13.3%	Chongqing	0.93	11.0%	Chongqing	1.45	20.6%
Chongqing	0.83	11.5%	Guangzhou	0.73	8.6%	Guangzhou	0.85	12.2%
Shanghai	0.60	8.3%	Shenzhen	0.44	5.2%	Shenzhen	0.36	5.1%
Others	0.66	9.1%	Others	1.53	18.1%	Others	1.08	15.4%
Total	7.21	100.0%	Total	8.43	100.0%	Total	7.01	100.0%
Dried bamboo shoots								
Guangzhou	1.73	64.7%	Guangzhou	1.61	65.4%	Guangzhou	2.00	75.4%
Shantou	0.33	12.2%	Shantou	0.32	13.0%	Shantou	0.22	8.3%
Shenzhen	0.28	10.5%	Shenzhen	0.22	9.1%	Shenzhen	0.15	5.5%
Fuzhou	0.16	6.1%	Huangpu	0.14	5.8%	Fuzhou	0.10	3.6%
Huangpu	0.10	3.6%	Fuzhou	0.09	3.5%	Xiamen	0.09	3.5%
Others	0.08	2.9%	Others	0.08	3.2%	Others	0.10	3.6%
Total	2.67	100.0%	Total	2.47	100.0%	Total	2.65	100.0%
Canned bamboo shoots								
Xiamen	27.72	24.1%	Xiamen	29.92	23.6%	Xiamen	35.54	25.5%
Shanghai	25.72	22.3%	Shanghai	28.90	22.8%	Shanghai	31.23	22.4%
Ningbo	21.26	18.5%	Fuzhou	25.35	20.0%	Ningbo	27.15	19.5%
Fuzhou	21.15	18.4%	Ningbo	23.98	18.9%	Fuzhou	26.70	19.2%
Shenzhen	6.53	5.7%	Shantou	6.95	5.5%	Shenzhen	6.28	4.5%
Others	12.83	11.1%	Others	11.86	9.3%	Others	12.40	8.9%
Total	115.20	100.0%	Total	126.95	100.0%	Total	139.30	100.0%

Source: The Customs General Administration of China.

Table 6.2. Shipping ports for China's exports of bamboo materials and plaiting products: 1997-99
(Unit: Quantity in 1000 tons)

	1997			1998			1999	
Customs	**Quantity**	**Share**	**Customs**	**Quantity**	**Share**	**Customs**	**Quantity**	**Share**
Bamboo materials								
Guangzhou	48.92	47.1%	Guangzhou	53.63	52.2%	Guangzhou	54.64	54.3%
Shanghai	16.23	15.6%	Huangpu	16.98	16.5%	Shanghai	14.44	14.3%
Shenzhen	13.95	13.4%	Shanghai	15.03	14.6%	Huangpu	12.31	12.2%
Huangpu	13.67	13.2%	Shenzhen	7.35	7.1%	Shenzhen	9.12	9.1%
Gongbei	3.22	3.1%	Fuzhou	2.67	2.6%	Xiamen	2.39	2.4%
Others	7.90	7.6%	Others	7.13	6.9%	Others	7.75	7.7%
Total	103.90	100.0%	Total	102.80	100.0%	Total	100.66	100.0%
Plaiting products of bamboo								
Shenzhen	20.16	34.5%	Shenzhen	18.24	36.4%	Shenzhen	19.45	33.9%
Shanghai	15.68	26.8%	Shanghai	12.19	24.3%	Shanghai	16.92	29.5%
Fuzhou	6.24	10.7%	Fuzhou	5.95	11.9%	Fuzhou	6.96	12.1%
Guangzhou	3.44	5.9%	Jiangmen	2.61	5.2%	Xiamen	2.95	5.2%
Ningbo	3.41	5.8%	Guangzhou	2.12	4.2%	Jiangmen	2.12	3.7%
Others	9.50	16.3%	Others	8.98	17.9%	Others	8.94	15.6%
Total	58.43	100.0%	Total	50.09	100.0%	Total	57.34	100.0%

Source: The Customs General Administration of China.

Table 7.1. Selected economic indicators for the sample firms (10,000 Yuan)

Items	**Average**	**Maximum**	**Minimum**
Total annual sales	2423	12000	24
Annual output value for bamboo products	1439	5000	22
Profits	103	380	5
Tax and fees	232	1200	2
Costs of Bamboo materials as proportion of output value	39%	70%	1%

Source: The author's survey data.