

**Productivity Effects of TVE Privatization: The Case Study of
Garment and Metal Casting Enterprises in the Great Yangtze
River Region**

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I. Introduction

Until the 1980s, China's miraculous economic growth had been led by publicly owned township and village enterprises (TVEs), which may be more accurately termed township- and village-run enterprises or TVREs (Chen et al. 1992; Jefferson et al. 1996; Otsuka et al. 1998).¹ In the 1990s, however, private sector has emerged to be a leading sector of the economy. In the southern region of Jiangsu province, whose successful record of economic development based on TVREs in the 1980s was dubbed "Sunan Model of Development," privatization of TVREs has been taking place in the late 1990s. Furthermore, the growth rate of Zhejiang province, which has depended consistently on the growth of private sectors since the beginning of the 1980s, outweighed most other provinces including Jiangsu in the 1990s (Zhang 1999).

While it is by now well known that privatization has been rapidly and widely taking place in China, it is much less known whether and to what extent privatization has improved resource allocation and productivity.² The major issue to be addressed in this study is to assess the productivity effects of TVE privatization quantitatively. If recent privatization results in improvement of production efficiency, the question immediately arises as to why it did not take place earlier. Also it is interesting to ask why TVREs prospered in Jiangsu in the 1980s. These issues are critically important in understanding the growth performance of Chinese economy in the 1990s and assessing its future growth potential for the early decades of the 21st century.

As a first step toward the fuller understanding of the effects of TVE privatization on

¹ Note that township and village enterprises (TVEs) include both TVREs and private enterprises.

productivity, this study undertakes case studies of the garment and metal casting enterprises in the Great Yangtze River Region extending from the suburbs of Shanghai to the western border of Anhui province. Common and important characteristics of TVREs in the suburbs of Shanghai and southern Jiangsu were identified to be their dependence on SOEs in technology, management, and marketing (Otsuka et al. 1998). Some TVREs used to be cooperative TVEs or “branch factory” of urban SOEs, in which managers were sent from SOEs and profits were shared between them in accordance with their investment shares (Fudan University Economic Research Center 1988). Putting-out contract was frequently made not only between SOEs and their branches but also between SOEs and independent TVREs. Moreover, TVREs often purchased second-hand machines used by SOEs and employed retired SOE workers for the acquisition of technology and management know-how (Murakami et al. 1994, 1996). It seems that township and village governments supported such transactions and cooperation through direct involvement of TVE management.³

Our maintained hypothesis is that such cooperation between TVREs and SOEs was mutually beneficial, at least during the 1980s. TVREs faced largely unregulated management environments, but lacked technology, management know-how, and marketing capacity. In contrast, the management of SOEs was tightly regulated, even though they had decent management, technology, and marketing knowledge. In the 1990s, two major changes seem to have taken place, which have eroded the advantage of the TVRE-SOE

² An exceptional and pioneering study is Li et al. (1999).

³ This view is consistent with the justification of TVREs by Che and Qian (1998), who argue that the advantage of local government ownership lies in reduction of state predation.

cooperation. First, TVREs have absorbed the production knowledge and capacity of SOEs, so that payoff to maintain cooperative relationship with SOEs has gradually declined (Liu and Otsuka 1998). Second, free market system has developed, so that the direct government support for the inter-enterprise transactions, particularly face-to-face transactions between TVREs and SOEs in our context, tends to lose its significance (Li 1996; Hsiao et al. 1998; Jin and Qian 1998; Chen and Rozelle 1999). Therefore, we hypothesize that privatization in the late 1990s has resulted in significant improvements in production efficiency by enhancing management incentives without sacrificing marketing efficiencies.

The organization of this paper is as follows. In the next section, sampling scheme is explained and basic statistics, such as the growth rate of valued added, are presented. After examining changing importance of own marketing and subcontracting transactions with SOEs, stock ownership by the local government vis-à-vis private owners, and profit rate, we estimate growth rate functions of capital-labor ratio and per worker value-added in order to assess the impacts of increased stock ownership by private agents on capital investment and productivity, separately for the garment and metal casting industries. Implications of this study will be discussed in the final section.

II. Data

To analyze determinants and consequences of TVE privatization, we use data collected by a rural enterprise survey conducted in 1999 and 2000 in the Great Yangtze River Region from the suburb of Shanghai to about 650 km points upstream. The study

areas include 5 counties in the suburb of Shanghai, 19 counties in the south of the Yangtze in Jiangsu province, and 29 counties between the Yangtze and the Huai He River in Anhui province. These areas are connected by an express-way which goes from Shanghai along the Yangtze River to Nanjin, the capital city of Jiangsu, crosses the river from south to north at Nanjin, and goes west up to and beyond Hefei, the capital city of Anhui. Sample enterprises were selected randomly from the enterprise lists compiled by local governments of 28 counties selected randomly from the 53 counties. The garment and casting samples consist of 78 and 80 enterprises, respectively.

We chose specific industries for case studies, because the productivity impacts of the privatization cannot be assessed unless we can reasonably assume identical production function parameters among sample enterprises. We chose the Great Yangtze River Region, because the influence of SOEs in Shanghai, a center of the state industrial sectors in China, tends to decline with the distance from Shanghai, so that sufficient geographical variations of the influence of SOEs can be observed. Garment and metal casting enterprises were chosen, partly because they are numerous over wide areas and partly because their dependence on SOEs is contrasting in which the metal casting enterprises wholly depend on SOEs in both input and output transactions as of now, whereas the garment enterprises are far more independent from SOEs.

The retrospective survey of enterprises provides information on production and costs as well as changing distributions of stock ownership in 1995, 1996, 1997, and 1998, and information on equipment and marketing channels in 1995 and 1998. During the 1995–1998 period, the nominal GDP growth rate, averaged over the 28 counties under

study, was 11.6 percent per year, which was much lower than the growth rate of 30.0 percent in 1993–1995.⁴

Table 1 shows the nominal growth rate of value added of sample enterprises and the number of observations by area. Value added was calculated as gross value of output minus costs of materials, energy, and water. The data of these variables in both 1995 and 1998 were complete only for 59 enterprises in each industry, particularly because of the entry of new enterprises after 1995.⁵ For descriptive exposition, study areas were classified into four regions: the suburb of Shanghai, Southeast Jiangsu, Nanjing and its outskirts (Greater Nanjing), and Anhui.

Southeast Jiangsu comprises Wuxi and Suzhou municipalities, which are located in a traditionally fertile granary and close to Shanghai. With such geographical advantages, the economy in this area started growing rapidly with the remarkable development of TVREs, as soon as the central government commenced economic reform in the late 1970s. By the early 1990s, the successful TVRE-led development strategy pursued in this area became widely known under the name of “Sunan Model.” Since the early 1990s, however, the Sunan Model has been challenged by another model of development formed in and around Wenzhou city in Zhejiang province, whose economy has been catching up with Southeast Jiangsu starting from much lower level of development. In this new model,

⁴ GDP growth rates were calculated using the data from the Statistical Yearbooks of Anhui, Jiangsu, and Shanghai in various years.

⁵ Each sample includes several new entrants established in 1995, 1996, or 1997. Those firms established in 1998 were excluded from the sample. The production data in the first year of operation of new entrants were not used in the analysis because variables in the first year have much greater variances than those in subsequent years.

high economic growth is driven by private TVEs and “disguised” TVERs which were essentially private but disguising themselves as TVREs because private enterprises were unfavorably treated under various regulations.

TVREs abounded also in Nanjing and its outskirts. Nanjing is the capital city in Jiangsu province, and probably for this reason, there are a larger number of SOEs and urban collective enterprises in this area than in Southeast Jiangsu. Accordingly, the relative importance of the TVRE sector is smaller in this area than in Southeast Jiangsu. In Anhui, where manufacturing was least developed among the study areas, the share of the SOE sector in gross industrial output was greatest, although the absolute size of the SOE sector was much smaller than in the other study areas.⁶ It is interesting to note that the share of private enterprises and self-employed small-scale family enterprises in Anhui province was greater than in the greater Nanjing area and Southeast Jiangsu in 1995 and earlier.⁷ This is consistent with the hypothesis that the development of the private sector is predominant in poor areas with few SOEs because local governments in such areas could not afford to establish a large number of TVREs in cooperation with SOEs.

As shown in Table 1, the average size of enterprises grew in all areas in the garment sample but declined in the casting sample from 1995 to 1998. The size of casting enterprises in Shanghai declined most significantly during the study period, which can be attributed mostly to anti-pollution regulations by the government of Shanghai which prohibits expansion and renewal of foundry equipments. Since regulations in other areas

⁶ Data of industrial output and its composition by sector, aggregated at the provincial level, are available from Statistical Yearbooks of Jiangsu and Anhui in various years.

⁷ The self-employed enterprises are those with seven workers or less.

were not as stringent as in Shanghai, customers were shifting orders away from foundries in Shanghai to those in other areas, especially in Southeast Jiangsu. This diversion of orders is reflected in Table 1: casting enterprises in Southeast Jiangsu had much better growth record than their counterparts in the rest of Jiangsu as well as Shanghai. In both garment and casting industries, Anhui enterprises were growing faster presumably due to the tendency of growth convergence.

A unique feature of this enterprise survey is that it traces changing distribution of ownership of capital stock as much as possible since the establishment of each sample enterprise and in detail during the 1995–1998 period. In general, before the distribution of ownership changed, an enterprise estimated capitalized value of its assets. In many cases, the local government was the sole owner at the time of capitalization, and then some shares were sold to managers, workers, or other individuals or enterprises outside the enterprise. In these cases, it is easy to trace changes in distribution of stock ownership. In some cases, however, the manager and the local government made initial investment jointly and the manager kept reinvesting profits in his enterprise, even though this enterprise had been registered as a TVRE. In such cases, it is difficult to trace the changing distribution of stock ownership before capitalization and, hence, we simply relied on the subjective assessment of key informants (who were usually general managers) on the ownership distribution. Finally, using the data of stock ownership, we define privatization as an increase in the share of private owners.

As shown in Table 2, we classified owners into five types: (i) local government, (ii) cooperative enterprises, (iii) workers, (iv) joint ventures with foreign enterprises, and (v)

private owners. By cooperative enterprises, we mean SOEs and urban collective enterprises with which the enterprises under study engaged in subcontracting. Private owners include, most importantly, the general manager and other leaders within the enterprise, and a relatively small number of individuals and enterprises outside the enterprise except SOEs and joint ventures. In the garment sample, there were a number of enterprises that had experienced partial privatization before 1995, as reflected in private stock ownership of as high as 25 percent. In the casting sample, most enterprises were 100 percent owned by the local government at least nominally, and there were a small number of completely private enterprises, most of which were outgrowths of self-employed, family enterprises. Thus, the average share of local governments was much higher in the casting sample in 1995. Surprisingly by coincidence, the average ownership share of local governments decreased to 30 percent and that of private owners increased to 50 percent in both samples in 1998. There is no question that rapid privatization took place in our study sites.

In the literature on ambiguous property rights in China, a central question is why TVREs could achieve remarkable growth performances in the 1980s and the early 1990s, despite disincentive effects on enterprise management of ambiguous ownership of TVREs by local governments and managers. A plausible answer to this question is that the market in this period in China was characterized by high transaction costs, which could be reduced by the intervention of local governments (Li 1996; Hsiao et al. 1998; Jin and Qian 1998; Chen and Rozelle 1999). Although not mentioned in the literature, we would like to emphasize that such transaction costs were particularly high when transactions were made

with SOEs. If the reduction in the transaction costs is really the reason why ownership of garment and casting enterprises was concentrated in the hands of local governments, what is the reason why ownership has been so rapidly and significantly diversified? We argue that the rapid and significant privatization can be attributed to significant development of free market, which reduced the contributions that local governments could make. If so, privatization ought to increase the production efficiency of rural enterprises. In order to examine the relevance of the above arguments, we will look at the production data more carefully in the next two sections.

III. Privatization and Growth in the Garment Industry

Garment enterprises in our sample produce a variety of garment products ranging from cheap underwear to expensive and technically difficult men's suits. In view of the presumed importance of marketing channels, these products are classified into three groups according to the ways in which they are transacted: original products, putting-out products, and OEM products. Original products are designed and marketed by sample TVEs themselves. Putting-out and OEM products are produced under subcontracting with large enterprises, such as SOEs and joint ventures. The difference between them is whether or not contractors put out materials. Table 3 shows percentage compositions of sales and average gross profit rates by the mode of transactions. Gross profit rates are defined as the ratio of value added minus wage payments to the net value of capital stock.

It is said that compared with Zhejiang province, garment enterprises in our study areas, especially those in Southeast Jiangsu, have high skills and expensive equipment to produce

high-quality products, but they are behind in establishing their own marketing network. A possible explanation for such differences is that Southeast Jiangsu enterprises could afford to invest in expensive machines and took advantage of geographical proximity to Shanghai to receive subcontracting orders from Shanghai SOEs and foreign ventures. Although garment enterprises in Anhui were not advantageous in these respects, they tended to follow the Sunan model, in that they had high propensity to subcontract with relatively small local SOEs and urban collectives. Thus, the average share of original products in sales was just 25 percent in 1995 and 22 percent in 1998, as shown in column (i) in Table 3.

In Table 3, putting-out and OEM are further classified into those with SOEs and other types of enterprises, such as trading companies. While the share of putting-out products for SOEs declined by 6 percentage point during the period under study, the share of OEM products for SOEs increased by 3 percentage point. Consistent with these changes, average gross profit rate for enterprises engaged in the latter transactions (shown in column (iv)) was significantly higher than those for the former transactions (column (ii)) and the overall average (column (vi)) in 1995.⁸ Closer inspection of the table reveals that the share of those transaction types with higher gross profit rates than the overall average in 1995 increased between 1995 and 1998. Thus, choice of transaction modes seems responsive to the difference in the profitability.

It is also noteworthy that OEM contracts with both SOEs and non-SOEs were attractive in 1995 but no longer so in 1998. This is presumably because there was sizable

⁸ The values of profit rates shown above are averages over all firms engaged in production of respective types. Note that the classification by type is not exclusive since a number of enterprises are engaged in two or three types of production.

new entry to this profitable subcategory of subcontracting transactions, thereby making this transaction mode more competitive. This can be considered to reflect the development of markets for materials, which would make it easy for garment enterprises to procure desired materials by themselves.

Table 4 compares ownership and growth performance of those enterprises engaged in OEM for SOEs (called OEM-SOE enterprises, henceforth) with other enterprises. In 1995, OEM-SOE enterprises are characterized by a higher average ownership share of local governments and lower share of private owners than other enterprises. This suggests that local governments' involvement was helpful in making and keeping lucrative OEM contacts with SOEs in 1995. In 1998, however, the ownership pattern was reversed, which suggests that the role of local governments in receiving OEM orders from SOEs largely disappeared.

The last three lines in Table 4 compare the two types of enterprises (grouped according to their types as of 1995) with respect to the growth rates of employment, the net value of equipment, and value added, respectively, in subsequent three years. It is expected that OEM-SOE enterprises would have relatively low growth rates because they lost the advantage of having lower transaction costs in lucrative OEM contracts with SOEs, as we have seen in Table 3. The comparison shown in Table 4 confirms this expectation. Note that OEM-SOE enterprises had growth rates of employment and equipment higher than the growth rate of value added, suggesting that they had negative growth in total factor productivity during the three-year period. This is likely due to lagged effects of privatization on productivity growth. In fact, Chan and Scott (1999) find that the very

short-run effect of privatization on total factor productivity is negative because of drastic reforms in management.

Thus, the more significant privatization of OEM-SOE enterprises may be explained by the two findings that OEM-SOE contracts became less lucrative and that the assistance of local government became less important in receiving OEM orders from SOEs. Privatization, which clarifies ambiguous property rights by increasing managers' ownership shares, would improve production efficiency by increasing profit-seeking incentives of managers. But for OEM-SOE enterprises, positive productivity effects seem to have been largely canceled out by losses of advantages in better access to a lucrative transaction. To date, however, few empirical studies have assessed the productivity effects of TVE privatization or confirmed even its existence. On the contrary, some theoretical studies presume that productive efficiency of a rural enterprise does not depend on the type of enterprise's ownership (e.g., Weitzman and Xu 1994). An exception is the pioneering work by Li et al. (1999), who find that although positive productivity effect exists, it is realized not right after privatization but with adjustment lags.⁹

To assess the productivity effect of privatization, we specified a growth function of the following general form:

$$(1) \quad G(V) = f(G(K), G(L), \Delta(\text{private share}), \text{OEMSOE}, \Delta(\text{private share}) * \text{OEMSOE}$$

Years of operation, Location, Product type),

where $G(V)$, $G(K)$, and $G(L)$ are growth rates of value added, equipment, and the number

⁹ Their use of dummy variables to represent the privatization is questionable in view of the continuous process of privatization.

of workers, respectively; $\Delta(\text{private share})$ is the change in the share of private owners during the three-year period, which is intended to capture the productivity effect of privatization; and OEMSOE is a dummy variable which equals 1 if the enterprise was an OEM-SOE enterprise in 1995, and 0 otherwise.¹⁰ Note that since the dependent variable is value added rather than physical quantity, it is affected not only by production efficiency but also by management efficiency, including efficiency in marketing. If the positive productivity effect of privatization was canceled out by declining profitability of OEM contracts, OEMSOE or its interaction term, $\Delta(\text{private share}) * \text{OEMSOE}$, would have a negative coefficient. Location is represented by three provincial dummies, road distance from Shanghai, and road distance from the nearest exit of the express-way. To represent product types, we used logarithm of value added per piece.

To avoid possibly serious multicollinearity between $G(K)$ and $G(L)$, and to control for the effect of enterprise specific unobservables, we modified equation (1) into the following estimable form:

$$(2) \quad G(V/L) = a_0 + a_1 G(K/L) + a_2 \Delta(\text{private share}) + a_3 \text{OEMSOE} + a_4 \Delta(\text{private share}) * \text{OEMSOE} + a_5 (\text{Years of operation}) + a_6 \text{Location} + a_7 \ln(\text{value added per piece}) + u.$$

We instrumented $G(K/L)$ with $\ln(K/L)$ in 1995, the growth rate of average annual wage earnings per worker at the county level during the 1995–1998 period, and gross profit rate in 1995. Although privatization itself is endogenous, $\Delta(\text{private share})$ is treated as an

¹⁰ In the earlier analysis, we also considered variables representing other types of transactions. They

exogenous variable at this stage of our study. Nonetheless, we expect that its coefficient is positive if it has positive effect on total factor productivity. Since higher profit rates would induce investments in capital stock, gross profit rate is expected to have positive effect on $G(K/L)$. It is, however, also conceivable that local governments took profits away from TVREs while leaving little fund for equipment investment. Thus, we included an interaction term of gross profit rate with TVRE dummy in the right-hand side of the $G(K/L)$ equation.

Table 5 reports 3SLS estimates of the K-L ratio growth function and the labor productivity growth function. In the first two columns, privatization is represented by the change in share of private ownership from 1995 to 1998 without paying attention to an adjustment process following privatization. The estimation of growth rate equations make it possible to identify the lagged effects of privatization by specifying lagged privatization variables. Thus, in columns (iii) and (iv), $\Delta(\text{private share})$ is replaced with three variables $\Delta(\text{private share})_i$, $i = 1, 2, 3$, which is a change in the share of private owners between the two consecutive years. If privatization has lagged effects on productivity, we expect that $\Delta(\text{private share})_1$ is more significant than $\Delta(\text{private share})_2$ and $\Delta(\text{private share})_3$. The interaction term is also replaced with three interaction terms accordingly, but $\Delta(\text{private share})_1 * \text{OEMSOE}$ is omitted because there was no OEM-SOE enterprise that was privatized between 1995 and 1996. To save space, we do not report the estimates of the effects of the location variables.

From the first two columns, there appear no effects of privatization on the growth of

are, however, generally insignificant.

K-L ratio or productive efficiency. In columns (iv), however, privatization that occur between 1995 and 1996 has a positive and significant effect on efficiency gain during the 1995–1998 period, whereas subsequent privatization has no significant effects. This is consistent with the finding of Li et al. (1999) and strongly suggests that privatization has significant productivity effects, even though there is adjustment lags following privatization.

The effects of OEMSOE are generally negative and its effect is significant in column (iii), which is consistent with the observation from Table 4 that OEM-SOE enterprises had only modest input and output growth. Note that the interaction terms of $\Delta(\text{private share})_i$ and OEMSOE have no significant effects on either the K-L ratio or labor productivity. If local governments' involvement in management had been important in reducing transaction costs even in 1998, the privatization of OEM-SOE enterprises would have negative growth effect due to the loss of this advantage. The result that the interaction terms have no significant effects supports the hypothesis that such a role of local governments disappeared by 1998 in this industry.

IV. Privatization and Growth in the Casting Industry

Unlike subcontracting in the garment industry, casting subcontracting was made almost exclusively with SOEs, especially those in and around Shanghai. Even in the case of original products manufactured and sold freely by TVEs, major buyers were mostly SOEs, and suppliers of important inputs, such coal and pig iron, were also SOEs. Thus, cooperation with SOEs was indispensable for casting enterprises and, hence, there is room

for local governments to play important roles in obtaining and maintaining cooperation with SOEs. This is likely to be reflected in the high average ownership share of local governments in 1995 shown in Table 2. The share, however, declined significantly by 1998, which suggests that the importance of local governments also declined during this period.

Table 6 shows percentage compositions of sales by the mode of transaction and by region. Original products accounted for 66 percent of sales on average in Anhui in 1995, but much less in a region closer to Shanghai. Typically casting enterprises in Anhui started as manufactures of machine parts as well as simple farming appliances. In contrast, typically casting enterprises in Shanghai and its outskirts used to be branch factories of SOEs, and now they are subcontracting with a number of SOEs as market opportunity expanded. According to our interviews with TVE managers, original products tended to be parts for light consumer goods and relatively simple machines, such as small pumps and tractor engines, while products subcontracted from SOEs were often parts for heavy equipments, such as huge engines for large ships. Heavy concentration of large SOEs in Shanghai and its vicinity seems to explain the finding from Table 6 that the sales share of subcontracting decreases as the distance from Shanghai increases.

Table 6 also shows average gross profit rates by transaction type. Considering the relatively low quality of original products, it is interesting to find that gross profit rates were higher for original product-oriented enterprises. This is likely due to the fact that the market for original products was riskier and growing faster or less stagnant than the market for subcontracted products. If this is indeed the case, it is expected that

marketing to new customers was more important in the case of original products, and that local governments would play a more important role in reducing costs of new transactions with SOEs. Thus, Table 7 compares the ownership structure of these original product-oriented enterprises with that of subcontracting-oriented enterprises. Both groups had similar ownership distributions in 1995, but consistent with our conjecture, the ownership share of local governments decreased less for original product-oriented enterprises in the subsequent three years.

Table 7 also compares growth performances of the two groups. The original product-oriented group had higher rates of growth in both output and inputs, as may be expected from their relatively high profit rates. This group seem to have had lower rate of TFP growth, however, because the growth rate of value added per worker [$G(V/L) = G(V) - G(L)$] was lower for this group, while the two groups shared almost the same growth rates of capital-labor ratio [$G(K/L) = G(K) - G(L)$]. It is conceivable that having benefited less from local governments' involvement, subcontracting-oriented enterprises reduced the ownership share of local governments more sharply in order to improve production efficiency. It seems that this group tried to achieve such productivity improvement partly by reducing formerly excessive employment rather than by increasing capital equipment. Original product-oriented enterprises also would have undertaken privatization for the purpose of efficiency improvement in the face of general decline in local governments' roles, but it was accomplished at the cost of competitive edge with respect to marketing. Hence, their privatization was more moderate than that of subcontracting-oriented enterprises.

Table 8 reports the results of estimation of growth functions similar to equation (2). Specification, however, is somewhat altered in the following ways. Dummy variable, OEMSOE, in (2) is replaced with dummy variables, ORIGINAL and BOTH, where ORIGINAL equals 1 if the sales share of original products is 100 percent, and BOTH equals 1 if this share is between 0 and 100 percent. Logarithm of value added per piece in the G(K/L) function is not used here since it turned out to be an inappropriate proxy for quality.¹¹ Instead, three dummy variables are included in this function: Mold, Metal processing, and Other product.¹² Furthermore, to control for interacted effects of location and transaction types, we use two new interaction terms: one is distance from Shanghai times the sales share of original product, and the other is distance from highway exit times the sales share.

As in Table 5, the first two columns of Table 8 do not take it into account that there may be time lag between privatization and the realization of its effects. In this specification, $\Delta(\text{private share})$ for 1995-98 does not have a significant effect on labor productivity growth, although it has a significant effect on K-L ratio growth. Judging from the negative coefficient of $\Delta(\text{private share}) * \text{ORIGINAL}$, the effect on K-L ratio was significantly positive only for subcontracting-oriented enterprises, which tended to reduce employment but increase capital equipments according to Table 7. In columns (iii) and (iv) where adjustment lags are taken into account, it is remarkable to find that privatization

¹¹ Value added per piece of the product is largely determined by the size of the product, not the quality thereof.

¹² If the enterprise was able to make cast mold on its own, Mold = 1. If it had capacity to process cast iron parts, Metal processing = 1. If it produced products other than cast iron or if it produced finished goods, Other product = 1. We presume that the greater incidence of in-house production generally

in the first year has positive and significant effect on labor productivity growth. It is also noteworthy that privatization in the third year has a positive and significant effect on K-L ratio but not on labor productivity. These results strongly indicate the importance of considering adjustment lags in assessing productivity effects of privatization; privatization may affect capital-labor ratio in the very short run, whereas it will affect production efficiency with at least a few years of time lags.

It must be also pointed out that the interaction term, $\Delta(\text{private share})_1 * \text{ORIGINAL}$, has a negative effect on labor productivity whereas ORIGINAL has positive and significant productivity effect. These results imply that although enterprises producing original products generally achieved higher production efficiency, the measured productivity, which includes efficiency in marketing, was reduced by privatization. These findings strongly support our conjecture that original product-oriented enterprises were privatized at the cost of marketing advantage. On the other hand, subcontracting-oriented enterprises achieved more drastic privatization because the role of local government was smaller in their markets.

V. Concluding Remarks

In this study we found that privatization of TVEs has been rapidly taking place in the Great Yangtze River Region since the mid-1990s. We argue that this is likely due to the declining importance of SOEs for the operation of TVREs and increasing importance of free market transactions, which made the intervention in the management of TVREs by

reflects the production of higher-quality products.

local governments less productive. Thus, we advanced the hypothesis that the recent privatization has improved production efficiency of township and village enterprises. Our hypothesis is clearly supported by the two-stage production function estimation for both the garment and metal casting industries, which commonly indicates that productivity was significantly enhanced by privatization with a few years of time lag. We also obtained evidence that contractual relations of township and village enterprises with SOEs and their dependence on free market transactions had significant impacts on capital investment and productivity in the late 1990s.

At this point, we must emphasize that in all likelihood, our analysis has identified mere short-run effects of privatization on productivity. In our observation, enormous gap still exists between private enterprises in Zhejiang and Jiangsu provinces. First, industries tend to be clustered in Zhejiang province to enjoy agglomeration economies arising from information externalities, division and specialization of labor among enterprises, and possibly the formation of skilled labor markets (Zhang 1999; Tang and Cheng 2000; Sonobe and Otsuka 2001). Such industrial clusters seem to have been formed through free market competition gradually over the last two decades. In contrast, industrial clusters have seldom been formed in Jiangsu province. Second, current competition among enterprises in Zhejiang province is centered around the production of differentiated, improved products, often with brand names, and the establishment of nation-wide marketing network. In Jiangsu, however, competition through brand names and the establishment of marketing network has begun late and taken place only among a small number of leading enterprises. It is likely that in the longer run, geographical

concentration of industries and the improvement of products and marketing capacity will take place in the Great Yangtze River Region. Upshot is that we have to carefully distinguish between the short-run effects of privatization, which would have arisen from improved management incentives, and longer-run effects, which would arise from investments in the development of improved products and the establishment of marketing systems, as well as from the formation of industrial clusters. The fact that the short-run incentive effect of privation is significantly positive strongly indicates that the privatization can be strong driving force leading to the continued improvement of productivity over long periods, so far as privatization enhances market competition among enterprises across wide areas.

References

- Che, Jiahua, and Qian, Yingyi. "Insecure Property Rights and Government Ownership of Firms." *Quarterly Journal of Economics* 113 (May 1998): 467-96.
- Chen, Hongyi, and Rozelle, Scott. "Leaders, Managers, and the Organization of Township and Village Enterprises in China." *Journal of Development Economics* 60 (December 1999): 529-57.
- Chen, Kang; Jefferson, G. H.; and Singh, Inderjit. "Lessons from China's Economic Reform." *Journal of Comparative Economics* 16 (June 1992): 201-25.
- Fudan University Economic Research Center. *The New Avenue for Enterprise Reform and Development: Survey Report on Horizontal Cooperation of Industrial Enterprises in Shanghai* [Qiye Gaige yu Fazhan Xinlu: Shanghai Gongye Qiye Hengxiang Lianhe Diaocha Baogaoji]. Shanghai: Fudan Daxue Chubansha, 1988.
- Hsiao, Cheng; Nugent, Jeffrey; Perringne, Isabelle, and Qiu, Jicheng. "Share versus Residual Claimant Contracts: The Case of Chinese TVEs." *Journal of Comparative Economics* 26 (1998): 317-37.
- Jefferson, G. H.; Rawski, T. G.; and Zheng, Yuxin. "Chinese Industrial Productivity: Trends, Measurement, and Recent Developments." *Journal of Comparative Economics* 23 (October 1996): 146-80.
- Jin, Hehui, and Qian, Yingyi. "Public versus Private Ownership of Firms: Evidence from Rural China." *Quarterly Journal of Economics* 113 (August 1998): 773-808.
- Li, David D. "A Theory of Ambiguous Property Rights in Transition Economies: The Case of the Chinese Non-State Sector." *Journal of Comparative Economics* 23 (August

1996): 1 – 19.

Li, Hongbin; Rozelle, Scott; and Brandt, Loren. “Saving or Stripping Rural Industry: An Analysis of Privatization and Efficiency in China.” A paper presented at the American Agricultural Economics Association Preconference in Nashville, TN, August 1999.

Lin, J. Y.; Cai, Fang; and Li, Zhou. *The China Miracle: Development Strategy and Economic Reform*. Hong Kong: Chinese University Press, 1996.

Liu, Deqiang, and Otsuka, Keijiro. “Township-Village Enterprises in Garment Sector of China.” In Y. Hayami (ed.), *Toward the Rural-Based Development of Commerce and Industry: Selected Experiences from East Asia*. Washington, DC: World Bank Institute, 1998.

Murakami, Naoki; Liu, Deqiang; and Otsuka, Keijiro. “Technical and Allocative Efficiency among Socialist Enterprises: The Case of the Garment Industry in China.” *Journal of Comparative Economics* 19 (December 1994): 410-33.

Murakami, Naoki; Liu, Deqiang; and Otsuka, Keijiro. “Market Reform, Division of Labor, and Increasing Advantages of Small-Scale Enterprises: The Case of the Machine Tool Industry in China.” *Journal of Comparative Economics* 23 (December 1996): 256-77.

Otsuka, Keijiro; Liu, Deqiang; and Murakami, Naoki. *Industrial Reform in China: Past Performance and Future Prospects*. Oxford: Clarendon Press, 1998.

Sonobe, Tetsushi, and Otsuka, Keijiro. “Role of Industrial Cluster in Development: A Case Study of Garment Town in China.” Mimeo. Tokyo: Tokyo Metropolitan

University, 2001.

Tang, R. and Cheng, L. “The Survey of Rural Economic Development in the South East Zhejiang Province” [Zhejiang Sheng Dongnan Diqu Nongcun Jingji Fazhang De Diaocha Yanjiu] *Jingji Tizhi Gaige* 113 (2000): 99-103.

Tao, Zhigang, and Zhu, Tian. “Agency and Self-Enforcing Contracts.” *Journal of Comparative Economics* 28 (2000): 80-94.

Weitzman, M. L., and Xu, Chenggang. “Chinese Township-Village Enterprises as Vaguely Defined Cooperatives.” *Journal of Comparative Economics* 18 (1994): 121-45.

Zhang, R. *The Systematic Review of Economic Transition in Zhejiang Rural Area* [Zhejiang Nongcun Jingji Gaige Tixi Yanjiu]. Hangzhou: Zhejiang Renming Chuban She, 1999.

Table 1. Average Annual Growth Rates of Value Added by Study Area, 1995–98 (%)

	Shanghai (i)	Southeast Jiangsu (ii)	Greater Nanjing (iii)	Anhui (iv)	Total (v)
Garment industry					
Growth rate	2.7	5.3	13.0	17.8	11.2 (8.5)
# of observations	8	14	19	18	59
Casting industry					
Growth rate	-15.9	-0.6	-6.6	5.0	-1.7 (-5.9)
# of observations	4	14	20	21	59

Notes: Value added = sales – material costs – marketing costs. Numbers in parentheses are weighted averages with weights being value added in 1995.

Table 2. Distribution of Stock Ownership by Type of Shareholders,
1995 and 1998 (%)

	Local govern- ment (i)	SOE (ii)	Workers (iii)	Foreign and joint ventures (iv)	Private owners (v)	Total (vi)
Garment industry						
1995	57	6	0	12	25	100
1998	30	5	2	13	50	100
Casting industry						
1995	77	5	1	3	14	100
1998	30	8	9	3	50	100

Table 3. Composition of Sales and Gross Profit Rates by Transaction Mode in the Garment Industry, 1995 and 1998 (%)

	Original Products (i)	Putting out		OEM		Total (vi)
		for SOEs (ii)	for other firms (iii)	for SOEs (iv)	for other firms (v)	
1995						
Share in sales	25	16	25	22	12	100
Profit rate	27.9	19.5	28.8	39.0	32.8	28.2
1998						
Share in sales	22	10	28	25	15	100
Profit rate	25.3	18.2	26.2	25.0	21.5	23.8

Notes: Profit rate = $100 \bar{v}$ (value added - wage payments)/net value of equipment. The values of profit rates shown above are averages over all firms engaged in production of respective types. Classification on the "profit rate" lines is not exclusive since a number of firms are engaged in more than two types of production.

Table 4. Ownership and Growth in the Garment Industry, 1995–98 (%)

	Firms engaged in OEM for SOEs (i)	Firms <u>not</u> engaged in OEM for SOEs (ii)	Total (iii)
1995			
Local government's share	67	51	57
Private owners' share	16	31	25
1998			
Local government's share	25	35	30
Private owners' share	56	45	50
1995 - 1998			
Annual growth rates of			
Employment	10.0	12.6	11.6
Equipment	9.0	12.3	11.0
Value added	6.0	14.0	11.2

Table 5. 3SLS Estimates of Growth Functions: The Garment Industry for 1995-98

	G(K/L) (i)	G(V/L) (ii)	G(K/L) (iii)	G(V/L) (iv)
G(K/L)		0.71** (0.13)		0.70** (0.13)
$\Delta(\text{private share})$	-0.02 (0.19)	0.35 (0.25)		
$\Delta(\text{private share})_1$			0.33 (0.27)	0.62* (0.36)
$\Delta(\text{private share})_2$			-0.12 (0.36)	-0.16 (0.47)
$\Delta(\text{private share})_3$			-0.26 (0.29)	0.31 (0.38)
OEMSOE	-0.23 (0.15)	-0.17 (0.19)	-0.26* (0.15)	-0.20 (0.19)
$\Delta(\text{private share}) \cdot \text{OEMSOE}$	-0.19 (0.29)	-0.24 (0.38)		
$\Delta(\text{private share})_2 \cdot \text{OEMSOE}$			0.13 (0.47)	0.30 (0.62)
$\Delta(\text{private share})_3 \cdot \text{OEMSOE}$			-0.03 (0.36)	-0.25 (0.48)
Years of operation	0.015** (0.005)	-0.006 (0.007)	0.015** (0.005)	-0.005 (0.007)
Profit rate ₁₉₉₅	0.07 (0.06)		0.06 (0.05)	
Profit rate ₁₉₉₅ * TVRE	-0.17** (0.07)		-0.13* (0.07)	
$\ln(K/L)_{1995}$	-0.51** (0.06)		-0.51** (0.06)	
G(wage)	0.82 (0.77)		0.64 (0.75)	
$\ln(\text{value added per piece})$	0.14* (0.06)	0.12 (0.08)	0.15** (0.06)	0.133* (0.075)
R-squared	0.71	-	0.71	

Notes: In addition to the explanatory variables shown above, all the estimated equations include three regional dummies, two distance variables, and an intercept. Numbers in parentheses are standard errors. * Significant at 5 percent, ** significant at 1 percent. The sample size is 57.

Table 6. Composition of Sales and Gross Profit Rates by Transaction Mode in the Casting Industry, 1995 and 1998 (%)

	Original Products (i)	Subcontracting (ii)	Total (iii)
1995			
Share in sales	51	49	100
Anhui	66	34	100
Nanjing	58	42	100
East Jiangsu	33	67	100
Shanghai	12	88	100
Profit rate	19.4	14.6	17.0
1998			
Share in sales	45	55	100
Anhui	60	40	100
Nanjing	55	45	100
East Jiangsu	25	75	100
Shanghai	13	87	100
Profit rate	13.3	11.6	12.5

Note: In the comparison of gross profit rates, an original product-oriented enterprise is defined as an enterprise with the sales share of original products being greater than 50 percent.

Table 7. Ownership and Growth in the Casting Industry, 1995–98 (%)

	Enterprises with original products share 0.5 (i)	Enterprises with subcontracting share > 0.5 (ii)	Total (iii)
1995			
Local government's share	79	78	77
Private owners' share	15	12	14
1998			
Local government's share	38	23	30
Private owners' share	46	55	50
1995 – 1998			
Annual growth rates of			
Employment	2.8	-1.4	0.3
Equipment	9.3	5.5	6.7
Value added	-0.7	-2.6	-1.7

Table 8. 3SLS Estimates of Growth Functions: The Casting Industry
1995-98

	G(K/L) (i)	G(V/L) (ii)	G(K/L) (iii)	G(V/L) (iv)
G(K/L)		0.57* (0.25)		0.65** (0.23)
$\Delta(\text{private share})$	0.32* (0.18)	0.21 (0.28)		
$\Delta(\text{private share})_1$			-0.28 (0.30)	0.98** (0.38)
$\Delta(\text{private share})_2$			0.26 (0.30)	-0.28 (0.39)
$\Delta(\text{private share})_3$			0.55** (0.20)	0.13 (0.29)
ORIGINAL	-0.85** (0.31)	0.74 (0.56)	-1.13** (0.35)	1.39** (0.57)
BOTH	-0.32* (0.16)	0.22 (0.28)	-0.45* (0.17)	0.28 (0.20)
$\Delta(\text{private share}) \cdot \text{ORIGINAL}$	-0.22 (0.28)	-0.91** (0.39)		
$\Delta(\text{private share})_1 \cdot \text{ORIGINAL}$			0.43 (0.48)	-2.19** (0.57)
$\Delta(\text{private share})_2 \cdot \text{ORIGINAL}$			-0.19 (0.40)	-0.50 (0.55)
$\Delta(\text{private share})_3 \cdot \text{ORIGINAL}$			-0.50 (0.44)	0.34 (0.65)
Years of operation	0.013* (0.007)	-0.01 (0.01)	0.017** (0.006)	-0.018 (0.011)
Profit rate ₁₉₉₅	-0.39** (0.09)		-0.35** (0.09)	
Profit rate ₁₉₉₅ * TVRE	0.58** (0.15)		0.59** (0.15)	
$\ln(K/L)_{1995}$	-0.22** (0.06)		-0.21** (0.06)	
G(wage)	1.70** (0.64)		1.74** (0.65)	
Mold	0.13 (0.12)		0.17 (0.14)	
Metal processing	-0.25* (0.12)		-0.37* (0.14)	
Other product	0.36** (0.11)		0.29* (0.13)	
R-squared	0.55		0.60	

Notes: In addition to the explanatory variables shown above, all the estimated equations include three regional dummies, four distance variables, and an intercept. Numbers in

parentheses are standard errors. * Significant at 5 percent, ** significant at 1 percent. The sample size is 58.