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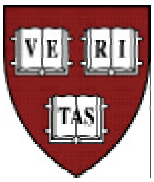

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Abstract

We study empirically the relationship between ownership of firms and institutional environment in transition and developing economies by examining China's rural non-farm sector, which consists of both private enterprises and community government-run enterprises (known as township-village enterprises, or TVEs). We found that all the variables related to the legacy of planning favor TVE ownership, and all the variables related to market-oriented reforms and market development encourage private ownership. We also found that TVEs help increase the revenue shares of state and community governments, as well as rural non-farm employment and income. However, their effect on rural income is insignificant given the level of non-farm employment.

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Ownership and Institutions: Evidence from Rural China

1. Introduction

In transition and developing economies, no single issue has received more attention by economists and policy makers than the one of property rights and ownership. There emerges now among economists a consensus on the normative question of why private ownership should be preferred to public ownership in general and in the long run. Yet, there is little research on the positive questions of how the ownership of firms evolves in the process of transition to markets and economic development and how it interacts with the changing institutional environment. As North (1991) noted, in order to understand the fundamental issue of the role of institutions on economic performance, there is a need to "dig deeper" into "the relationship between the basic institutional framework, the consequent organizational structure, and institutional changes."

In this paper, we study empirically the interrelationship between the ownership of firms and the institutional environment in the transition and developing process. Specifically, we examine the distribution of ownership of non-farm firms in rural China, which consist of both private enterprises and community government-run enterprises known as township-village enterprises (TVEs).[1] We ask: What economic and institutional factors underlying the market and government give advantages to one form of ownership of firms over another? And what is the impact of ownership distribution on rural development given the institutional environment?

There are several reasons why we focus on rural China. First, as the largest transitional and developing economy, China has experienced rapid institutional changes in the past 18 years of reforms and, at the same time, achieved about a 10% average annual growth rate. It is widely recognized that rural industry is the most dynamic sector and the main engine of the growth. In 1993, total employment in rural enterprises reached 123 million, accounting for about one half of the national non-farm employment. Second, interestingly, with removal of legal restrictions on private enterprises but without the central government's effort to promote privatization, both private enterprises and TVEs flourished spontaneously in the rapidly changing institutional environment.[2] Between 1979 and 1993, the TVE share of national industrial output expanded from 9% to 27% and the share of rural private enterprises increased from 0% to 9% (*Statistical Yearbook of China*, 1994). And third, the relative share of TVEs vs. private enterprises in rural China varies greatly across regions and also over time. The average share of TVE employment in rural industry was 64% in 1986, falling to 58% in 1993. In 1993, the highest share was 97% (Shanghai) and the lowest was 25% (Guizhou). This great variation provides us with an opportunity for studying the relationship between ownership and institutions.

China's TVEs represent a major puzzle to economists studying transition and development economics as well as property rights. TVEs are not traditional state-owned enterprises (SOEs), cooperatives, or private enterprises; yet they have played a central role in China's rural-based

[1] It is sometimes observed that some private firms register as TVEs in order to receive benefits such as access to credit. However, this type of "pseudo TVE" is not widespread. Furthermore, as soon as a private firm registers as a TVE the community government steps in, which compromises private ownership. For both reasons, ignoring "pseudo TVEs" should not undermine our analysis.

[2] Deng Xiaoping said on June 12, 1987 that "the greatest achievement [in China] that was totally out of our expectation is that TVEs have developed" (*Economic Daily*, June 13, 1993).

industrialization. Although they are uniquely Chinese innovations, they are also in accordance with the general East Asian model of rural-based development (Hayami 1996 and Otsuka 1996).

Several institution-based theories have been developed recently to account for the TVE phenomenon.[3] These theories can be divided into two categories. In the first, theories identify factors which might give advantages to TVEs relative to private enterprises in the prevailing economic and institutional environment of China. We examine five theories in this category. The theory of financing investment emphasizes the availability of credit in the presence of imperfect capital markets (Byrd 1990, Che and Qian 1995); the theory of security of property rights focuses on the ability of political protection of community governments (Chang and Wang 1994, Li 1996, Che and Qian 1996); the transaction cost theory looks for the relative cost advantage of a particular ownership in dealing with the state sector and the market (Nee 1992); the economics of geography links local growth potential with its urban proximity (Naughton 1994, 1996); and the theory in historical perspective emphasizes the importance of the past collective experience in rural China (Chang and Wang 1994).[4] In the second category, theories identify the objectives of the community government and then establish the linkage between developing TVEs and achieving these objectives. The three major objectives of the community government are identified as increasing community government revenue (Byrd and Gelb, 1990 and Oi, 1992 and 1994), industrialization as measured by non-farm employment, and increasing per capita income (Rozelle and Boisvert 1994).

We test the above theories against a set of panel data which can account for both regional variations and changes over time.[5] In investigating factors determining the relative share of TVEs vs. private enterprises in rural industry, our multivariate regression results show that all the variables related to the legacy of planning and the strength of the state encourage TVE ownership, and all the variables related to market-oriented reforms and market development encourage private ownership. As for the impact of ownership distribution on rural development, we found that the TVE share in the rural non-farm sector increases both the state and community government share of revenue but much more so for the latter. While the TVE sector helps increase rural non-farm employment, its effect on rural real per capita income is insignificant for the given level of non-farm employment.

Our empirical results reveal the nature of ownership of TVEs and private enterprises in relationship to the institutional environment in which they operate. Several important insights on the relationship between ownership and institutions can be derived, which may have implications beyond China. First, the distribution of firms between community public and private ownership reflects institutional factors which characterize the process of transition and development; in particular, the dominance of community public ownership is explained by the strength of the state and/or the lack of market development. Second, ownership of TVEs serves as an effective vehicle for both the state and the

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[3] The emphasis on institutions is mainly for two reasons. First, TVEs generally face similar state tax rates and pay similar competitive wages to workers as private enterprises. Second, choice of technology by rural enterprises is viewed as endogenous because it is determined by institutional factors such as availability of state credit and connection with the state firms.

[4] In addition to the above five theories, Weitzman and Xu (1994) appeal to the Chinese cooperative culture for the success of TVEs which they view as having no clearly defined property rights. We leave this theory out because we are unable to measure variations of cooperative culture across regions and over time.

[5] The only similar work on the issue that we are aware of is that of Naughton (1996), who, using 1987 and 1992 data and univariate regressions, finds a positive correlation between the share of TVEs in a province and its "urban proximity."

community government to raise more revenue and for the community government to keep a larger share within the community, which provides evidence on the incentives of governments to develop TVEs. The development of TVEs helps avoid government revenue crises in transition economies due to the decline of planning-based revenue sources and the underdevelopment of market-based taxation institutions (McKinnon 1991). It also helps correct urban bias in revenue allocation typically found in developing economies which hinders rural development (Bates 1987). And third, although TVEs can generate a higher level of rural non-farm employment than private enterprises, they have no significant effect on rural per capita income for a given level of non-farm employment. Because of the relatively high capital-labor ratio in TVEs, this fact may suggest that TVEs are less efficient than private enterprises and the current advantage of TVEs may diminish as market institutions develop further.

The paper is organized as follows. Section 2 summarizes alternative theories on the ownership of TVEs and their testable implications. Section 3 explains the econometric models used in testing. Section 4 describes the data. Section 5 presents empirical results on the factors determining the relative share of TVEs vs. private enterprises in rural industry. Section 6 presents results on the effects of ownership distribution on rural development in terms of rural revenue distribution, non-farm employment, and per capita income. Section 7 contains our conclusions.

2. Theories of TVEs

The Chinese economy can be divided into urban and rural areas. Firms in the urban area are classified as state-owned, collectives, or private (including foreign firms). Non-farm firms in the rural area are of two types in terms of ownership: community government-run enterprises (i.e., TVEs) and private enterprises. A rural community can be either a township (which consists of, on average, about 3,500 households) or a village (which consists of on average about 200 households). These are the lowest levels of government in China; above them are county, prefecture, province and the central government. While state-owned enterprises (which are controlled by governments at and above the county level) have declined during the reform, the "non-state sector" (which includes TVEs together with private enterprises and urban collectives) has become the engine of growth.

By 1993, there were 1.5 million TVEs with 52 million employees. Previous studies have shown that they perform much better than state-owned enterprises in productivity growth and seem not significantly worse than private enterprises (Jefferson and Rawski 1994). Several institution-based theories have been developed recently to account for the TVE phenomenon.[6] These theories can be divided into two categories. Theories of the first type identify factors which might give advantages to TVEs relative to private enterprises in the prevailing economic and institutional environment of China. In the second category, theories first identify the objectives of the community government, then establish a linkage between developing TVEs (rather than private enterprises) and achieving the government's goals. We outline these theories and list some important implications which can be tested empirically.

[6] Our main interest here is the comparison between TVEs and private enterprises. The other two directions of research on TVEs are left out of the paper: First, there are studies on the internal incentive structures of TVEs, such as types of managerial incentive contracts (e.g., Chen and Rozelle, 1996 and Hsiao, Nugent, Perrigne and Qiu 1996). Second, there are also studies comparing TVEs with SOEs to explain why, both being government controlled, TVEs perform better than SOEs (e.g., Che and Qian 1995 and Qian and Weingast 1996).

2.1. Determinants of Ownership

(1) Financing of Investment

This theory proposes that TVEs have distinct advantages in financing investment compared to private enterprises. The start-up capital for private enterprises comes mainly from owners or other households with little coming from bank loans. TVEs are able to access a larger pool of capital because the community government helps to secure loans from banks. There are both political and economic institutional reasons for this. TVEs have a political advantage over private enterprises in financing investment. For example, the community government can make use of its political power and connections to channel loans from banks to TVEs. Furthermore, political discrimination against private enterprises makes lending to them politically more risky than to TVEs. TVEs also have economic advantages in financing investment (Byrd, 1990, Che and Qian, 1995). For example, the community government is able to share risks by cross-subsidization among its many diversified enterprises, thus reducing the default risks borne by banks. The community government can also reduce agency costs in borrowing because of its larger endowment in physical and financial assets. From both the political and economic perspectives, the advantages of TVEs relative to private enterprises in financing investment are due to the under-development of financial institutions and the incompleteness of capital markets. This theory should imply that the relative share of TVEs is positively correlated with the supply of credit from state financial institutions, but negatively correlated with the level of private financial assets which indicates the extent of financial market development.

(2) Security of Property Rights

This theory is associated with the advantages of TVEs over private enterprises in securing political protection. Chang and Wang (1994) observe that under the current political institutions in China, the community government can provide political security to their own enterprises. Li (1996) argues that the community government's protection of TVEs is more effective than that of private enterprises because ownership gives the community government better information about the operation of TVEs. Che and Qian (1995, 1996) argue that, because the community governments also carry out government activities for the state, it is more credible for the state to be less predatory towards TVEs than private enterprises in the absence of institutions constraining the state from discretionary revenue extractions. This theory implies that the share of TVEs is positively correlated with the local political strength of the community government against the pressure from the higher level government, but negatively correlated with the change of nationwide ideology in favor of the market economy.

(3) Transaction Costs

This theory relates TVEs to the partial liberalization of the economy. Nee (1992) contends that under partial reforms, the transition economy in China is characterized by emerging but weak market institutions and poorly specified and enforced property rights on the one hand, and declining but still functioning planned institutions on the other. TVEs under government control have a cost advantage in dealing with SOEs, but private enterprises have the cost advantage in markets. TVEs enjoy a transaction cost advantage over private enterprises because TVEs have better access to resources still controlled by the state. TVEs also often involve in subcontracting relationship with state-owned enterprises (Otsuka 1996). This theory suggests a positive relationship between the share of TVEs and the importance of links with the state sector, and a negative relationship between TVEs and market development.

(4) Urban Proximity

Naughton (1994, 1996) views developing TVEs as a vehicle for the community government to convert community assets (i.e., land) to cash flow under the particular characteristics of China's transition to markets, namely, product markets developed in advance of asset markets. This theory implicitly assumes an imperfect land rental market so that the only way of transforming land into income streams is to directly operate businesses on it. Because land close to urban areas is more valuable, communities closer to urban areas have more incentives to transform assets into income streams by developing TVEs. However, one may also argue that a higher degree of urbanization may reduce the disadvantages of private enterprises (which are usually small at the start) of doing business through more accessible outlets for output, increased support for specialized inputs, labor market pooling, and technological spillovers. Naughton's testable hypothesis is the positive correlation between the share of TVEs in a community and its "urban proximity," which is a measure of the proximity of the community to urban centers weighted by urban population.

(5) Collective Heritage

Private enterprises were prohibited before the reform in 1979 and the community government was concentrated with organizational resources and human capital through collective organizations in both agriculture and rural industry. One might argue that the organizational inertia gave TVEs an organizational advantage over private enterprises (Chang and Wang 1994). One might also argue that the legacy of a larger collective sector provided incentives for the community to suppress private enterprises, for example, to reduce competition in the skilled labor market (Luo 1990). This hypothesis implies that the relative share of TVEs in the late 80s and early 90s should positively correlate with the initial base of the rural collective sector at the beginning of reforms.

2.2. The Impact of Ownership and Incentives of the Community Government

(1) Government Revenue

Revenue imperatives of the community government in developing TVEs have been emphasized in several studies. Byrd and Gelb (1990) hold that, because fiscal budget transfers from higher level government to the community government in China are very limited, the community government relies on TVEs as the most significant revenue source. Oi (1992, 1994) emphasizes that through the fiscal contracting system implemented in the 1980s, communities became independent fiscal entities, having both the responsibility for local expenditures and the right to use the revenue they retained. However, they did not explain why revenue imperatives of the community government are necessarily linked to the development of TVEs. In a developed market economy, government ownership of firms may not help increase government revenue, and even worse, the inefficiency associated with public ownership is likely to decrease both profits and government revenue as compared with private ownership. One plausible explanation for the positive linkage between TVE ownership and government revenue is that, due to inadequate accounting and taxation institutions, it is hard for the government to tax private firms. But the government can better extract revenue from TVEs because ownership gives the community government both control and information. If this theory is correct, we should expect a positive correlation between the share of TVEs and the share of community government revenue in total rural income.

(2) Non-Farm Employment

Rural industrialization, measured here by the share of non-farm employment in the total rural labor force, ranks very high in community leader's objectives (Rozelle and Boisvert 1994), and is an often claimed motive for the community government to develop TVEs by the government itself. Reduction of rural underemployment is especially important in China because of the restrictions on labor migration from the rural to urban areas. However, whether developing TVEs is a more effective way than developing private enterprises to increase non-farm employment depends on the net effect of the following two factors. On the one hand, private enterprises typically have much lower capita-labor ratios (Zhang and Ronnas 1993), thus they may provide more employment opportunities for a given level of capital investment. On the other hand, because of the imperfect capital market and because TVEs are able to mobilize more capital than private enterprises, TVEs may bring in more capital investment which leads to more non-farm employment.

(3) Per Capita Income

Another often claimed objective of the community government in developing TVEs is raising per capita income within the community.[7] Because of the costs and restrictions on labor migration, one way TVEs could contribute to raising per capita income is through increased local employment opportunities. If mobility were low cost and without constraints, a local increase in demand for labor would have little effect on per capita income since it would provide employment for persons who otherwise would have migrated. Another way TVEs could contribute to raising per capita income is through an increased local public goods provision due to the improvement of the community government's revenue, as local public goods are usually under-supplied in the rural areas.

3. The Econometric Model

The econometric model described in this section tries to explain the distribution of employment and output between TVE ownership and private ownership. Assume that the probability of observing a worker (or unit of output) being employed (or produced) by TVEs rather than private enterprises in province I, P_i, is a function $f(x_i)$ of determining variables x_i, a Kx1 vector. Denote n_i as total employment (or output) and p_i as the observed share of TVEs in the total. Our goal is to determine econometrically the effects of each variable in x_i on ownership distribution P_i.

The simplest functional form for $f(x_i)$ is the linear probability function

$$P_i = f(x_i) = x_i'\beta \tag{1}$$

where β is a Kx1 vector of parameters. Hence we have $(dP_i/dx_{ij}) = \beta_j$. In this case, the observed share p_i is related to the independent variables by

$$p_i = x_i'\beta + u_i \tag{2}$$

where the error term u_i has a binomial distribution with mean zero and variance $\sigma_{ui}^2 = P_i(1-P_i)/n_i$. If P_i is known, equation (2) can be estimated by weighted least squares. When P_i is not known, a feasible GLS

[7] In an econometric estimation of village leaders' objectives, Rozelle and Boisvert (1994) showed that the leaders are concerned about community welfare.

estimator of β is obtained by replacing P_i with its consistent estimator, such as the fitted value of p_i based on the OLS estimation.

Despite its ease and simplicity, the linear probability model has a serious drawback: there is no guarantee that the estimated probability will fall in the unit interval. If the variations of P_i and x_i are large, the linear function may not be an appropriate functional form.

A more appropriate specification would be the logit model, which assumes the logistic function:

$$P_i = f(x_i) = 1/[1 + \exp(x_i'\beta)]. \tag{3}$$

Hence we have $(dP_i/dx_{ij}) = \beta_j P_i(1-P_i)$. As shown by Zellner and Lee (1965), this formulation has the property that the "odds ratio" is a log-linear function of $x_i\beta$ that can be approximated by

$$\ln[p_i/(1-p_i)] = x_i'\beta + v_i \tag{4}$$

where v_i is a random term with mean zero and variance $\sigma_{vi}^2 = 1/[n_i P_i(1-P_i)]$. Again, a feasible GLS estimator of β is obtained by weighted least squares, after replacing P_i with its consistent estimator.

The error terms in equations (2) and (4) only include the error due to random sampling. However, at least two other major error sources should be taken into account. First, there may be errors due to missing variables. Although we try to include all the major determining factors, there may be minor variations in local conditions which affect ownership distribution but are not captured in our independent variables. Second, there may be measurement errors in employment and output data. Moreover, both types of error may be correlated with the sampling errors.

To take into consideration these error sources, the error term in equation (2) is assumed to have a more general form:

$$p_i = x_i'\beta + \epsilon_i \tag{2a}$$

and the variance of ϵ_i is assumed to be:

$$\sigma_{\epsilon i}^2 = \alpha_0 + \alpha_1\sigma_{ui} + \alpha_2\sigma_{ui}^2 \tag{2b}$$

where α_i $(I = 0,1,2)$ are unknown parameters, which can be estimated consistently based on residuals from the OLS estimation.

Similarly, equation (4) is transformed into:

$$\ln[p_i/(1-p_i)] = x_i'\beta + e_i \tag{4a}$$

and e_i has variance:

$$\sigma_{ei}^2 = \gamma_0 + \gamma_1\sigma_{vi} + \gamma_2\sigma_{vi}^2 \tag{4b}$$

where γ_i $(I = 0,1,2)$ are unknown parameters, which can also be estimated consistently based on residuals from the OLS estimation.

Another problem with panel data is that the error terms for each cross-section unit may be serially correlated. To deal with this problem, the maximum likelihood procedure described by Beach and MacKinnon (1978) is used to correct for first order autocorrelation.

4. Data

We use provincial data from 1986 to 1993.[8] There are 28 provinces, excluding Tibet and Hainan. We incorporate Hainan into Guangdong in our data because Hainan separated from Guangdong and obtained a provincial status only in 1988. The two main advantages of using such comprehensive data as compared with using survey data are, first, the data covers the entire country which has great variations across provinces, and second, the data also has a time dimension which allows us to study changes over time. The Appendix contains information on the construction and sources of all regression variables.

Determinants of Ownership

Our study of the determinants of ownership concerns the relative shares of TVEs and private enterprises in rural industry excluding services. We focus on industry here in order to avoid the problem of heterogeneity of technologies between industry and services. The summary statistics of the regression variables are reported in Table 1.

It is interesting to note that there are enormous variations across provinces. In 1993, TVEs on average employed 2 times more workers than private enterprises. The employment ratio of TVEs to private enterprises is highest in Shanghai, where TVE employment is 32 times that of private employment, and lowest in Guizhou, where it is only one third that of private employment. Overall, there is a decline in TVE employment and gross output relative to private enterprises between 1986 and 1993, and the variation across provinces increases. This suggests that TVEs grew faster or declined more slowly than private enterprises in the provinces where they were already dominant, but grew more slowly or declined faster than private enterprises in the provinces where they were initially weak. The output displays a similar pattern.

We use the following independent variables to test the alternative theories.

(1) Supply of credits from state financial institutions. The credit here refers to the non-agriculture loans available from the Agricultural Bank of China (ABC) and Rural Credit Cooperatives (RCCs), which are the two major credit sources in rural areas for all rural enterprises including both TVEs and private enterprises. The nominal amount of credit is first deflated by the TVEs' output price index and then normalized by the total rural enterprise employment. Therefore, our index of the state supply of credit represents the amount of non-agriculture loans in real terms available per employee for rural enterprises from state financial institutions.

[8] The choice of data from 1986 to 1993 is based on availability. Data after 1994, if it exists, may present some problems because since 1994 a new category of ownership emerged known as "joint stock cooperatives," in addition to TVEs and private enterprises, but there is no unified national rule to distinguish this form from TVEs and private firms.

(2) Private financial assets. The rural financial market outside the state financial institutions has developed rapidly since the mid-1980s.[9] We use private financial assets as an indicator for financial market development. Because the data for total private financial assets is not available, the total rural household savings deposits is used instead, which is a reasonably good proxy if the amount of household saving deposits is roughly proportional to the amount of total financial assets held by households. We normalize private household savings deposits in a province by its rural gross output. This measure is parallel to the usual measure for "financial deepening," which is the ratio of total financial assets in the economy to total GDP. Therefore, our index of private financial assets is not an indicator of the level of private wealth, but of the development and importance of private financial markets in the rural economy.

(3) Local political strength. The political strength and organizational capability of local community leaders are both hard to measure.[10] We use the percentage of rural households in a province NOT adopting the *Dabaogan* system -- the agricultural Household Responsibility System based on fixed renting -- at the end of 1983 as an index for local politics. Compared with other forms of responsibility systems, under the *Dabaogan* system the collectives need not be involved in any production decision making and revenue sharing arrangements. The *Dabaogan* system was both welcomed by households and accepted and actively promoted by the central government at the beginning of 1983. As a result, 94.5% of rural households nationwide had adopted this system by the end of 1983, with the highest being 99.82% found in Ningxia and the lowest 39.40% in Beijing. Those places which did not adopt this reform by this time clearly displayed strong control of community leaders over collective activities and demonstrated their political strength to resist pressures from both above and below.

(4) The size of the state sector. The size of the urban state sector is measured by the per capita state industrial real output in a province. This serves as an index of the potential linkage of a rural enterprise with the state sector in the province. A better index would be the total transaction volume between the state sector and the rural industry within a province, but no such data is available.

(5) Development of the product market. We use the total transaction volume in rural free markets divided by the total rural gross output to measure development of the product market. The transaction volume in the rural free market indicates overall private trading activities in the markets for farm products and consumer goods, as well as producer goods. A higher index means a better opportunity for enterprises to obtain a supply of materials from, and to sell their outputs to, the market rather than the state sector. We note that the local industrial enterprises only account for a small share of transactions in these markets and thus this index can be thought as exogenous.

(6) Urbanization. We use two indices for urbanization. The first index is measured by the share of urban population in the total population. We use the 1990 census data because this data is the most appropriate for our purposes.[11] A related but different index for urbanization is the urban proximity index

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[9] A study estimates that the capital flows through the informal financial markets are larger than those through the formal channels after 1990 (Liu, 1993).

[10] We initially hoped to use more direct indices for local political strength, such as Party membership, the number of Party and government officials, and subscription to Party newspapers and magazines in townships and villages. Unfortunately, no provincial data are available.

[11] According to this index, excluding the three huge cities of Beijing, Tianjin and Shanghai, the highest are 49.28% in Heilongjiang and 38.92% in Guangdong, and the lowest are 14.74% in Yunnan and 15.15% in Henan. Two other sets of data, one a non-agriculture population and the other a population of designated cities and towns,

constructed by Naughton (1996). This index is a weighted average of the inverse of distance from the center of a province to selected major cities, using the city population as weight. Both indices have their drawbacks. The urban population index does not take into consideration the factor of distance and hence may underestimate the levels of urbanization for the provinces like Jiangsu and Hebei, which are close to Shanghai and Beijing, respectively. The urban proximity index has some degree of arbitrariness in the choice of province center and major cities.

(7) Initial collective assets. Collective heritage is measured by the per capita collective fixed assets in 1980, with the highest of 508.23 yuan in Shanghai and the lowest of 33.90 yuan in Guizhou. This is the earliest data available to us, although 1979 is usually regarded as the beginning of reform. Per capita collective assets indicate the initial base of the rural collective sector and are a proxy for the accumulated physical and human capital under the control of the community government at the beginning of reform. Therefore, this index measures the initial endowment of the community government which could affect the development of TVEs.

(8) Year dummies. We use time dummies for each year between 1987 and 1993 to capture any changes over one particular year as compared with the previous year. Because macroeconomic policy changes over years have already been controlled by the variable of state credit supply, time dummies are used to capture the nationwide shift of official ideology regarding plans and markets due to changes in the Party line. We pay particular attention to two subperiods. The period between 1989 and 1990 represents a major shift of ideology in a more conservative direction after the Tiananmen incident. The period between 1992 and 1993 shifts to a more liberal direction, as in the spring of 1992 when Deng Xiaoping made his famous trip to the southern part of China in an effort to promote market-oriented reform. In the autumn of the same year, the Chinese Community Party endorsed "socialist market economy" as the official Party line for replacing central planning. In 1993, the Chinese Community Party further adopted a blueprint for market-oriented reform.

The Impact of Ownership and Incentives of the Government

The impact of ownership distributions on rural development will be examined from the three aspects of distribution of rural net income, rural non-farm employment, and rural per capita income. The summary statistics of the regression variables are reported in Table 2.

We first consider the distribution of rural net income. The net income of the rural economy is generated from three sources. The first two sources are the income generated by farm households and private enterprises respectively. Part of this income is paid to the state as taxes, part goes to community governments under the name of "collective reserves," and the remaining part is retained by households. The third source is the income generated by TVEs. Part of this income is submitted to the state as taxes and fees, but a major part goes to households as wages, bonuses and interest payments, and the remainder (including retained profits) is controlled by community governments. From the destination perspective, the net income of the rural economy is distributed among three entities: the state (governments above the township level), the community (township and village) government, and households. The state revenue includes all state taxes and other fees remitted to the government above the township level. The community revenue is the income received by township and village governments, including retained profits

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are not appropriate; the former is downward biased, and the latter is upward biased.

in TVEs. Remaining income belongs to households. We use the shares of the state, the community government, and households in net rural income to measure the distribution of rural income.[12]

We then consider the level of rural development in terms of non-farm employment and income. We divide the sum of employment in TVEs and private non-farm enterprises, both including industry and services, by the total rural labor force to indicate the development of the rural non-farm sector. We measure rural income level by rural real per capita income, defined as rural income in 1980 constant price divided by rural population.

The major explanatory variable is the share of TVEs in rural non-farm employment, which provides a measure of the importance of TVE ownership relative to private ownership in the non-farm sector including both industry and services. We use this index here because all of our dependent variables concerning employment and income include the sources from industry and services.

5. Estimation Results: The Determinants of Ownership in Rural Industry

Table 3 presents results from the simple univariate regressions (coefficients for year dummies are not reported). The shares of TVEs in both industrial employment and output are positively correlated with each of the following five variables: credit supply from state financial institutions, local political strength, the size of the state sector, urbanization, and initial collective assets. Therefore, based on univariate regressions, all of the five theories seem to have their intuitive appeal.

Tables 4 and 5 show the multivariate regression results for ownership distributions in terms of employment and output in rural industry respectively. For each of them, both the results from the linear probability model and the logit model are reported. The four sets of regressions give qualitatively similar results, which suggests that our results are quite robust.

First, the coefficients for supply of credits from state financial institutions are positive and significant, while the coefficients for private financial assets are negative and significant in all regressions. This gives support to the financial theory of TVE ownership. A large supply of state non-agricultural loans can increase the relative share of TVEs because the community governments help to secure loans from state financial institutions.[13] However, with the increased importance of private financial assets in the rural economy, which indicates more developed informal financial markets, private enterprises have more opportunities to finance their investment from non-state financial sources in addition to state financial institutions.

Second, the evidence also supports the theory of security of property rights. The local political strength has played an important role favoring TVEs, as indicated by its positive and significant coefficients in all the regressions. A higher capability of local leaders to resist pressures from higher levels of government provides more effective political protection for TVEs, and therefore favors their development. As will be shown in the next section, a higher share of TVEs gives a higher share of revenue to the community government, which then has the incentive to provide more protection to TVEs

[12] A more refined approach would distinguish further between farm and non-farm incomes accrued to the three entities. Unfortunately, there is no such data available.

[13] To accommodate the potential endogeniety problem, a two stage least squares regression is run using total loanable funds as an instrumental variable, and the signs and significance of coefficients remain the same.

than to private enterprises. An alternative interpretation of this result would be that a recalcitrant community government is less hospitable toward private enterprises. However, we found in a separate series of regressions that local political strength does not reduce the *level* of private enterprise development even after controlling for other determining variables, such as state supply of credit, urbanization, initial conditions, and market development, which seems not to support this latter interpretation.[14]

Examining the year dummies we found that the political retrenchment in 1989 and 1990 does not directly change the relative share of TVEs vs. private enterprises. However, the year dummies for 1992 and 1993 are significant and negative, which implies that TVEs experienced a notable decline relative to private enterprises in these two years of liberalization. This asymmetry shows that a nationwide ideology shift toward conservatism does not effectively reduce the share of private enterprises in the rural economy, but an ideology shift in a liberal direction leads to a significant prosperity of private enterprises. This is because the removal of existing restrictions on private enterprises induces instant responses; in contrast, adding new restrictions has little immediate effects as it takes time to establish effective enforcement.

Third, the coefficients of the development of product markets are all negative and significant, which suggests that product market development favors private enterprises. On the other hand, the effect of the size of the state sector on TVEs is positive and significant in the logit models, but insignificant in the linear probability models. Therefore, a larger state sector seems to favor TVEs (for example, through subcontracting). These results are consistent with the transaction cost theory of TVEs.

Fourth, the coefficients of the two urbanization variables -- the share of urban population and Naughton's urban proximity index -- are consistently negative and significant in all the regressions. Notice that the univariate regression gives a positive coefficient of the urbanization index, but such a result no longer holds in the multivariate regression. Hence, after controlling for other variables, a high degree of urbanization favors private enterprises. This suggests that either the community government can extract land rents by arrangement with private enterprises, and/or private enterprises take advantages of being located near urban areas for a more accessible outlet for output, increased support for specialized inputs, labor market pooling, and technological spillovers.

Finally, the initial collective assets have a positive and significant effect on the TVE's shares in later years. According to the first interpretation, those regions with a larger base of accumulated physical and human capital in the collective sector prior to the reform tend to give organizational advantages to TVEs relative to private enterprises. According to an alternative interpretation, the legacy of a larger collective sector early on helps suppress private enterprises in the years to follow. Either interpretation accords well to the theory of TVEs in historical perspective and demonstrates the "path dependence" nature of institutional changes in the sense of North (1991).

We have also included in our regressions variables such as education (measured by the percentage of the rural labor force who have more than primary schooling) and the per capita cultivated land. All of these variables are not significant in explaining the distribution of ownership in rural industry and the results are not reported here. This suggests that the institutional factors are most important in explaining ownership distribution in rural China.

[14] The level of private enterprise development is measured by a ratio of private enterprise employment to total rural labor force.

In summary, the evidence shows that TVEs are favored when the credit supply from state financial institutions is large, local political strength is strong, the potential linkages with the state sector are large, and the per capita collective assets at the beginning of the reform are large. On the other hand, private enterprises are more likely to develop if there is more urbanization, more developed private financial markets, more developed product markets, and a less hostile ideological environment toward markets.[15] This leads to the following general conclusion: The legacy of planning favors ownership in the form of TVEs, and the market-oriented institutional changes encourage private ownership.

6. Estimation Results: The Impact of Ownership and Incentives of the Government

This section investigates the impact of ownership distribution on rural development in terms of raising community government revenue, promoting non-farm employment, and increasing rural per capita income.

We first examine the consequence of TVE ownership on net income distributions among the state, the community, and households. In addition to region dummies and year dummies, we include three major explanatory variables in the regressions. The per capita income is included because it is a conventional variable in determining the income distribution between governments and households. We also include local political strength because it may affect the income distribution between the state and the community government. For our purpose, the major explanatory variable is the relative importance of TVEs vs. private enterprises in the non-farm sector. Because of the endogeneity of ownership determination, all independent variables in estimating ownership determination are used as instrumental variables. In addition, the AR(1) procedure given by Beach and MacKinnon (1978) is used to deal with autocorrelation problems. Both the results with and without instrumental variables are reported in Table 6.

The state share of revenue is positively related to real per capita income, which is consistent with the similar trends in other countries. After controlling for real per capita income, the TVE share in rural non-farm employment has positive effects on both the state and community government shares in net rural income but negative effects on the share of household income. We found that a 1 percent increase in the TVE share in rural non-farm employment would increase the state share of revenue by 0.1 percent and the community government's share by 0.2 percent. Thus, ownership of TVEs serves as an effective vehicle for both the state and the community government to raise more revenue and for the community government to keep a larger share within the community, which provides evidence on the incentives of governments for developing TVEs.[16]

This result may have significant implications for transition and developing economies. All transition economies have been experiencing government revenue shortfalls because of the collapse of the planning-based mechanism of revenue extraction. At the same time, the state often finds it difficult to tax

[15] Interestingly, because the state credit supply and the size of the state sector have increased between 1986 and 1993, the decline of TVE share in this time period can be seen as the result of the stronger offsetting effect from the development of product and financial markets and the shift of ideology.

[16] The results are consistent with both benevolent government theory and corrupt government theory. For the former, the revenue is supposedly used for local public goods to benefit the community (such as agriculture and infrastructure investment); for the latter, the revenue enhances the personal welfare of government officials. Although we are unable to distinguish between the benevolent and corrupt theories of government, our results demonstrate the incentives of governments in either case.

new private firms due to the lack of market-based taxation institutions (McKinnon 1991). On the other hand, the government in developing economies, for political reasons, often biases the revenue allocation toward urban areas which hinders rural development (Bates 1987). The above results show empirically that TVEs help raise and keep more revenues for the community government thus overcoming these two problems. Although the mechanism is very different, the TVE-driven rural industrialization in China agrees with the general East Asian model of rural-based development (Hayami 1996 and Otsuka 1996).

Interestingly, although the local political strength does not have significant effects on the community government's share and household share of revenue separately, it can significantly reduce the state share in rural revenue, and hence increase the community and household share as a whole. These results demonstrate there exists a conflict of interest between the state and the community government but not so much between the community government and households. However, this does not necessarily imply that the total effect of the local political strength has a negative impact on the state's share of revenue because it has a positive indirect effect through the increased TVE's share. We have run an alternative regression and found that the total effect of local political strength on the state's share of revenue is indeed positive and significant.

We then investigate the impact of TVEs on rural development in terms of non-farm employment and rural per capita income. We view these two variables as dependent on each other, and both of them also depend on local endowments. Therefore, in addition to the TVE's share in non-farm employment as the ownership variable, we also include per capita cultivated land and geographic location (i.e., urbanization) as local endowment variables. We employ AR(1) regressions with instrumental variables to cope with both the problems of simultaneity and autocorrelation, using the same instrumental variables as above.

Table 7 reports the results. The TVE's share in the rural non-farm sector has a positive effect on the share of rural non-farm employment in the total rural labor force, even after controlling for per capita income. This implies that TVEs are able to create more non-farm employment opportunities than private enterprises. Although private enterprises generally have a lower capital-labor ratio than TVEs, lack of access to capital may be sufficiently severe to hinder their ability in increasing non-farm employment. Our result supports the theory that TVEs help achieve the government's goal of increasing non-farm employment, but it does not mean that TVEs are more efficient than private enterprises in creating non-farm employment in the rural areas where capital is scarce and labor is abundant.

After controlling for the level of non-farm employment, the effect of the TVE's share of the rural non-farm sector on rural per capita income is insignificant. Combining with the previous results on non-farm employment, the total effect of TVEs on rural per capita income is still positive. That is to say, the effect of TVEs on increasing per capita income works only through expansion of non-farm employment. On the other hand, our result shows that for any given level of non-farm employment, TVEs do not generate higher per capita income than private enterprises. Taking into account the fact that TVEs have a higher capital-labor ratio than private enterprises, this result indicates that TVEs are probably less efficient than private enterprises, and their current advantage may diminish as market institutions develop further.

7. Conclusions

We have examined empirically the relationship between the distribution of ownership and institutional environment in rural China. Our results suggests that although TVEs are likely to be less efficient than private enterprises, they are more effective in exploiting opportunities in the existing institutional environment. No doubt that TVEs have captured some rents embedded in the imperfect institutions; but our results also indicate that TVEs induce productive activities which increase employment and income in rural China under the imperfect institutions.

The organization structure of TVEs keeps changing. Since 1994, TVEs have been evolving further and some of them have been transformed into a mixed corporate form known as "joint-stock cooperatives," a new organizational innovation. These changes deserve further research, but in the spirit of this paper, they also reflect the ever changing institutional environment.

In transition and developing economies, both market and government institutions are imperfect and take time to develop. The incompleteness of markets and the persistence of old state institutions affect the distribution of ownership of firms, which in turn affects the process of development. But development will further affect institutional changes. Understanding this dynamics will enhance our knowledge of the process of transition and development.

Appendix: List of the Data Sources

China Statistical Yearbook (CSY)
- -- Number of Social Labor Force
- -- Gross Industrial Output Value in the State Sector

China Rural Statistical Yearbook (CRSY)
- -- Rural Gross Social Output Value
- -- Gross Agricultural Output Value
- -- Gross Non-Agricultural Output Value
- -- Number of Rural Labor Force
- -- Number of Farm Labor Force
- -- Percent of Household not adopting Household Responsibility System in 1983
- -- Rural Population (Organization Coverage)
- -- Cultivated Land

China Agriculture Statistical Yearbook (CASY)
- -- Rural Total Output Value
- -- Rural Gross Income
- -- Rural Gross Revenue
- -- Gross TVE Revenue (distribution data)
- -- Rural Net Revenue
- -- State Taxes and Fees from Rural
- -- Net Revenue Retained by TVE and Remit to Township and Village Government
- -- Net Revenue received by Households
- -- Net TVE Revenue (distribution data)
- -- Gross Agricultural Output Value
- -- Net Agricultural Output Value

China Township Enterprises Statistical Yearbook (CTESY)
- -- Number of Employees in Township-run Enterprises
- -- Number of Employees in Village-run Enterprises
- -- Number of Employees in Rural Private Enterprises
- -- Gross Output Value of Township-run Enterprises
- -- Gross Output Value of Village-run Enterprises
- -- Gross Output Value of Rural Private Enterprises
- -- Rural population

Township Enterprises Statistical Material 1978-1985 (TESM)
- -- Per Capita Collective Fixed Assets in 1980

China Population Yearbook 1991 (CPY)
- -- Urban population in 1990 census

China Rural Finance Statistical Yearbook (CRFSY)
- -- Rural Household Savings Deposits
- -- Loans to rural enterprises by Agriculture Bank of China and Rural Credit Cooperatives

China Industrial and Commerce Administration Statistics 40 Years, China Domestic Trade Statistical Yearbook (CICAS)
- -- Volume of Rural Free Market Transactions

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Table 1. Summary Statistics of Variables (I)

	Mean	Minimum	Maximum	Standard Deviation
Employment Ratio of TVEs to Private Enterprises in Industry	2.695	0.292	32.408	4.224
Output Ratio of TVEs to Private Enterprises in Industry	4.480	0.520	102.038	8.928
Employment Share of TVEs in Total Rural Industry	0.585	0.226	0.970	0.169
Output Share of TVEs in Total Rural Industry	0.680	0.342	0.990	0.140
State Supply of Credit	1.244	0.258	8.366	1.051
Private Financial Assets	0.139	0.014	0.318	0.055
Product Market Development	0.084	0.008	0.241	0.044
Local Political Strength	0.094	0.002	0.606	0.128
Size of the State Sector	0.159	0.027	1.210	0.179
Share of Urban Population	0.311	0.147	0.732	0.162
Urban Proximity Index	0.032	0.015	0.073	0.016
Log of Initial Collective Assets	4.926	3.523	6.231	0.547

Notes: (1) State supply of credit: real loan amount from ABC and RCCs available to rural enterprises divided by total rural enterprise employment (1,000 yuan/employee).
(2) Private financial assets: total rural household savings deposits divided by rural gross output.
(3) Product market development: total transaction volume in rural free markets divided by total rural gross output.
(4) Local political strength: share of rural households in a province NOT adopting the *Dabaogan* system -- the agricultural Household Responsibility System based on fixed renting -- at the end of 1983.
(5) Size of the state sector: state industrial real output in a province divided by total population (10,000 yuan/person).
(6) Share of urban population: urban population in the 1990 census divided by total population.
(7) Urban proximity index: a weighted average of the inverse of distance from the center of a province to selected major cities, using city population as weight (see Naughton 1996).
(8) Log of initial collective assets: collective fixed assets in 1980 divided by rural population (log(yuan/person)).

Table 2. Summary Statistics of Variables (II)

	Mean	Minimum	Maximum	Standard Deviation
State Share in Rural Net Income	0.072	0.025	0.283	0.047
Community Government Share in Rural Net Income	0.082	0.011	0.272	0.058
Household Share in Rural Net Income	0.845	0.462	0.954	0.101
Share of Non-Farm Employment in Total Rural Labor Force	0.261	0.076	0.827	0.139
Rural Per Capita Real Income	0.352	0.153	1.417	0.223
Share of TVEs in Rural Non-Farm Employment	0.494	0.198	0.970	0.179
Per Capita Cultivated Land	1.441	0.476	4.824	1.074

Notes: (1) State share in rural net income: state (governments above township level) taxes and fees collected in rurual areas divided by rural net income.
(2) Community government share in rural net income: township and village government revenue from TVEs and private firms and retained profits in TVEs divided by rural net income.
(3) Household share in rural net income: household income (including farming and non-farming, and wages from TVEs) divided by rural net income.
(4) Share of non-farm employment in total rural labor force: total employment of rural enterprises (TVEs and private enterprises) divided by total rural labor force.
(5) Rural per capita real income: rural net income in 1980 price divided by rural population (1,000 yuan/person).
(6) Share of TVEs in rural non-farm employment: TVE employment divided by total rural enterprise employment.
(7) Per capita cultivated land: total cultivated land divided by rural population (mu/person).

Table 3. Determinants of Ownership: Univariate Regressions (t-statistics in parentheses)					
	(1)	(2)	(3)	(4)	(5)
Employment Share of TVEs in Rural Industry					
Constant	0.494 (21.331)	0.516 (20.984)	0.564 (22.038)	0.356 (13.981)	-0.589 (8.678)
State supply of credits	0.172 (15.741)				
Local political strength		0.902 (13.650)			
Size of the state sector			1.147 (15.930)		
Share of urban population				0.008 (17.213)	
Log of initial collective assets					0.241 (18.364)
Adjusted-R^2	0.520	0.446	0.526	0.565	0.446
Output Share of TVEs in Rural Industry					
Constant	0.614 (30.144)	0.633 (29.073)	0.624 (29.917)	0.525 (21.208)	-0.107 (1.553)
State supply of credits	0.134 (13.920)				
Local political strength		0.678 (11.592)			
Size of the state sector			0.854 (12.977)		
Share of urban population				0.006 (12.379)	
Log of initial collective assets					0.163 (12.189)
Adjusted-R^2	0.458	0.366	0.422	0.398	0.391

Table 4. Determinants of Ownership: Share of TVEs in Rural Industrial Employment
(t-statistics in parentheses)

	The Linear Probability Model		The Logit Model	
Constant	0.108 (1.333)	0.094 (1.136)	-1.832 (4.953)	-1.962 (5.252)
Local political strength	0.253 (3.457)	0.233 (3.386)	2.215 (9.051)	2.021 (8.844)
State supply of credits	0.092 (8.569)	0.096 (8.713)	0.368 (8.479)	0.381 (8.467)
Size of the state sector	-0.056 (0.542)	-0.027 (0.262)	2.137 (5.948)	2.001 (5.611)
Private financial assets	-0.436 (5.045)	-0.428 (4.849)	-2.201 (5.509)	-2.124 (5.157)
Product market development	-1.076 (7.270)	-1.088 (7.211)	-4.372 (6.354)	-4.383 (6.202)
Share of urban population	-0.237 (2.900)		-1.771 (5.010)	
Urban proximity index		-2.264 (2.576)		-17.092 (4.449)
Log of initial collective assets	0.124 (7.080)	0.127 (7.026)	0.580 (7.328)	0.606 (7.402)
Year dummy for 1987	-0.003 (0.197)	-0.004 (0.227)	-0.029 (0.396)	-0.034 (0.427)
Year dummy for 1988	-0.017 (1.102)	-0.017 (1.074)	-0.091 (1.231)	-0.092 (1.171)
Year dummy for 1989	-0.003 (0.221)	0.003 (0.214)	0.013 (0.180)	0.013 (0.161)
Year dummy for 1990	-0.018 (1.190)	-0.019 (1.185)	-0.058 (0.786)	-0.059 (0.746)
Year dummy for 1991	-0.002 (0.153)	-0.003 (0.193)	-0.007 (0.094)	-0.011 (0.136)
Year dummy for 1992	-0.022 (1.391)	-0.022 (1.370	-0.139 (1.905)	-0.144 (1.859)
Year dummy for 1993	-0.039 (2.421)	-0.039 (2.369)	-0.164 (2.197)	-0.167 (2.093)
Std. error	0.069	0.069	0.302	0.303
Log-likelihood	288.867	288.413	-41.759	-42.485
Adjusted-R^2	0.800	0.798	0.862	0.859
No. of Obs.	224	224	224	224

Table 5. Determinants of Ownership: Share of TVEs in Rural Industrial Output
(t-statistics in parentheses)

	The Linear Probability Model		The Logit Model	
Constant	0.581 (5.939)	0.543 (5.582)	0.226 (0.470)	0.027 (0.056)
Local political strength	0.448 (4.841)	0.429 (4.825)	2.846 (7.276)	2.726 (7.209)
State supply of credits	0.089 (7.475)	0.096 (7.842)	0.502 (8.092)	0.528 (8.306)
Size of the state sector	0.217 (1.894)	0.188 (1.639)	3.350 (6.243)	3.032 (6.191)
Private financial assets	-0.257 (2.244)	-0.228 (1.965)	-1.508 (2.508)	-1.444 (2.367)
Product market development	-0.919 (5.357)	-0.981 (5.566)	-4.645 (5.269)	-4.890 (5.454)
Share of urban population	-0.450 (4.631)		-3.079 (6.348)	
Urban proximity index		-4.851 (4.673)		-31.511 (6.077)
Log of initial collective assets	0.048 (2.320)	0.059 (2.817)	0.280 (2.747)	0.347 (3.368)
Year dummy for 1987	-0.008 (0.486)	-0.009 (0.496)	-0.072 (0.711)	-0.077 (0.721)
Year dummy for 1988	-0.006 (0.324)	-0.005 (0.333)	-0.060 (0.584)	-0.058 (0.534)
Year dummy for 1989	0.004 (0.240)	0.005 (0.248)	0.028 (0.269)	0.034 (0.304)
Year dummy for 1990	-0.043 (2.243)	-0.045 (2.268)	-0.195 (1.789)	-0.201 (1.746)
Year dummy for 1991	0.012 (0.614)	0.010 (0.521)	0.054 (0.489)	0.055 (0.469)
Year dummy for 1992	-0.033 (1.706)	-0.034 (1.712)	-0.200 (1.806)	-0.212 (1.852)
Year dummy for 1993	-0.048 (2.430)	-0.049 (2.369)	-0.219 (1.891)	-0.218 (1.799)
Std. error	0.128	0.081	0.403	0.398
Log-likelihood	256.437	252.810	-106.695	-103.723
Adjusted-R^2	0.629	0.655	0.764	0.762
No. of Obs.	224	224	224	224

Table 6. Ownership and Distribution of Net Rural Income
(t-statistics in parentheses)

	With Instrumental Variables			Without Instrumental Variables		
	State Share	Community Share	Household Share	State Share	Community Share	Household Share
Constant	-0.049 (7.957)	-0.059 (5.316)	1.109 (81.109)	-0.040 (7.378)	-0.022 (2.571)	1.061 (102.207)
Share of TVEs in rural non-farm employment	0.110 (6.518)	0.209 (7.197)	-0.328 (8.726)	0.095 (8.748)	0.087 (5.547)	-0.180 (8.661)
Net per capita rural income	0.142 (7.338)	0.043 (1.261)	-0.175 (4.041)	0.150 (10.690)	0.119 (5.694)	-0.272 (10.094)
Local political strength	-0.068 (3.261)	0.006 (0.153)	0.055 (1.185)	-0.125 (8.276)	0.029 (1.300)	0.101 (3.509)
Dummy for Beijing, Tianjin and Shanghai	0.016 (2.209)	0.024 (1.784)	-0.045 (2.740)	0.021 (2.921)	0.029 (2.687)	-0.054 (3.911)
Year dummy for 1987	0.006 (1.475)	0.007 (0.771)	-0.013 (1.327)	0.006 (1.300)	0.002 (0.266)	-0.008 (0.909)
Year dummy for 1988	0.005 (1.175)	0.008 (0.892)	-0.013 (1.328)	0.005 (0.996)	0.007 (0.887)	-0.011 (1.270)
Year dummy for 1989	0.013 (2.965)	0.002 (0.264)	-0.015 (1.509)	0.013 (2.790)	0.005 (0.639)	-0.018 (1.990)
Year dummy for 1990	0.004 (1.054)	0.000 (0.001)	-0.005 (0.481)	0.004 (0.866)	-0.000 (0.060)	-0.003 (0.381)
Year dummy for 1991	0.004 (0.907)	0.006 (0.730)	-0.010 (1.026)	0.004 (0.837)	0.006 (0.808)	-0.010 (1.131)
Year dummy for 1992	0.002 (0.471)	0.010 (1.257)	-0.012 (1.319)	0.002 (0.460)	0.003 (0.436)	-0.006 (0.644)
Year dummy for 1993	0.012 (2.752)	0.005 (0.624)	-0.017 (1.805)	0.011 (2.395)	0.003 (0.387)	-0.014 (1.566)
Std. error	0.015	0.027	0.034	0.016	0.024	0.031
Log-likelihood	602.048	480.558	428.651	615.658	523.427	469.333
Adjusted-R^2	0.890	0.728	0.868	0.885	0.829	0.908
No. of Obs.	224	224	224	224	224	224

Table 7. Ownership and Rural Non-Farm Employment and Per Capita Income
(t-statistics in parentheses)

	With Instrumental Variables		Without Instrumental Variables	
	Share of non-farm employment in rural labor force	Net per capita rural income	Share of non-farm employment in rural labor force	Net per capita rural income
Constant	-0.142 (4.466)	0.024 (0.498)	-0.004 (0.198)	0.013 (0.490)
Share of TVEs in rural non-farm employment	0.469 (5.718)	0.191 (0.362)	0.056 (1.752)	0.313 (0.632)
Net per capita rural income	0.155 (2.086)		0.345 (8.280)	
Share of non-farm employment in rural labor force		0.971 (4.639)		0.650 (8.283)
Per capita cultivated land	0.012 (1.720)	-0.006 (0.768)	-0.010 (1.983)	-0.009 (1.386)
Dummy for Beijing, Tianjin and Shanghai	0.007 (0.217)	0.152 (4313)	-0.019 (0.729)	0.178 (5.476)
Share of urban population	0.147 (1.943)	0.018 (0.201)	0.281 (5.029)	0.169 (2.137)
Year dummy for 1987	0.031 (1.733)	-0.017 (0.855)	0.021 (1.180)	-0.007 (0.434)
Year dummy for 1988	0.022 (1.230)	-0.011 (0.582)	0.015 (0.838)	-0.003 (0.191)
Year dummy for 1989	-0.002 (0.121)	-0.026 (1.341)	0.003 (0.147)	-0.028 (1.622)
Year dummy for 1990	-0.003 (0.194)	0.010 (0.529)	-0.007 (0.401)	0.009 (0.519)
Year dummy for 1991	0.404 (0.225)	-0.007 (0.384)	-0.005 (0.267)	-0.007 (0.384)
Year dummy for 1992	0.025 (1.395)	0.009 (0.441)	0.015 (0.810)	0.019 (1.100)
Year dummy for 1993	0.031 (1.702)	-0.009 (0.466)	0.023 (1.297)	0.004 (0.233)
Std. error	0.066	0.073	0.052	0.072
Log-likelihood	287.205	264.188	351.253	279.648
Adjusted-R^2	0.731	0.852	0.860	0.897
No. of Obs.	224	224	224	224