HOW MUCH DOES OWNER TYPE MATTER FOR FIRM PERFORMANCE? MANUFACTURING FIRMS IN CHINA 1998–2007

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Who owns the firm (the state, private ownership, foreign investors) has long been an important topic for research on organizations. This paper estimates how much ownership contributes to firm performance, compared to other factors, including industry, region, firm size, year, and the firm itself. The data are on manufacturing firms in mainland China from 1998 to 2007. We find that the effect of owner type is significant and pervasive across regions and interacts with both geography and time, reflecting China's decentralized system and the strong trend in privatization. Copyright © 2014 John Wiley & Sons, Ltd.

INTRODUCTION

For several decades, researchers in strategy have studied the potential effect of institutional factors on firm performance (Oliver, 1991). Institutional variables include varieties of regulation, fiscal and monetary policy, capital market characteristics, and governance characteristics of the firm (see e.g., Hall and Soskice, 2001; Rajan and Zingales, 2004). In this research note, our purpose is to estimate the contribution to performance of one important institutional variable, a firm's owner type (Demsetz, 1988; Mascarenhas, 1989; Morck, 2005).

Our study falls within a broad research program focusing on ownership in general. There have been a number of empirical studies showing how differences between owner types influence firm performance (for family owned firms, see Villalonga and Amit, 2006; for group owners, see Khanna and Rivkin, 2001; for ownership by a multi-business firm, see Rumelt, 1991). The results of these studies are mixed but overall suggest that types of owner differ in their contributions to performance variation over time.

We limit our study to the significance of owner type in countries making the transition to some form of capitalism and focus specifically on China (Peng, Wang, and Jiang, 2008). In emerging markets there are commonly three pervasive types of owner—the state, private investors, and foreign corporations. The prevalence of the state as an owner contrasts with more developed countries, where it typically plays a much reduced role in the economy. The higher variance among owner types in emerging markets due to the state's involvement makes them a useful setting for examining how much ownership influences firm performance relative to other factors (see Estrin, 2002).

Amid the widely varying countries that have shifted to a capitalist model in the past 40 years or so (Estrin *et al.*, 2009; Witt and Redding, 2012), China stands alone. Its economy in terms of GDP is bigger and growth rate much stronger. Its population is huge (1.3 billion) by any comparison and correspondingly its labor market and base of consumers enormous. It is geographically large and regionally diverse (27 provinces and 4 independent cities). It has become a major exporter in a wide range of manufacturing industries, with a correspondingly large number of manufacturing firms, much more than other emerging economies. Moreover, several authors have argued that the enduring role of the state as an owner makes China less representative of emerging markets in general (Wilson, 2007; Witt and Redding, 2012). In particular, the Chinese government has maintained control in many sectors including telecommunications, media, transportation, and energy, through both total and partial ownership.

While we cannot mitigate the potentially unique effects of China's overall size, we can reduce the impact of pervasive state ownership by focusing on a sector where the Chinese government has markedly reduced its holdings. That sector is manufacturing. Manufacturing offers a particularly useful setting since it contains a relatively high variance in owner type, both in cross section and over time, within and across regions. From 1998 to 2007, the period we examine here, the number of privately-owned manufacturing firms grew very rapidly, as state owned firms either failed or were sold; also, the number of foreign-owned manufacturing firms increased substantially (see Figure 1). Thus all three types of owner—state, private, and foreign—are well represented in the manufacturing sector over the 10 years we study. Further, the sector contains a very large number of firms and is spread throughout the country's provinces and autonomous cities. This wide distribution allows us to examine regional differences in ownership effects due to the decentralization of state control to provincial levels of administration, as well as differences due to region-specific rates of privatization and foreign entry (Dougherty and McGuckin, 2008; Fligstein and Zhang, 2009; Huang, 2008).

THEORY

Our premise here is that each type of owner—state, private, and foreign—imposes specific goals and constraints on firm governance and offers the firm opportunities for resource acquisition through network ties. Through the pursuit of their interests and their use of dedicated external networks, owners determine in part how a firm allocates resources and establishes contracts with suppliers and customers, thus influencing the firm's performance in its product markets (see Demsetz, 1988, chapter 2; Cuervo and Villalonga, 2000; Mascarenhas, 1989). More generally, Coase (1960) argues that, given transaction costs, who owns the firm affects how its economic returns are distributed among stakeholders and thus how much of its earnings it keeps.

State ownership

In emerging economies, state-owned enterprises have been found to have lower performance than privatized firms. But in their summary of the empirical literature, Estrin *et al.* (2009) show that this positive effect is not found in all countries, nor for all types of private owners. In China, however, the results clearly show the state-owned firms do not perform as well as the private sector (Bai, Lu, and Tao, 2009). State-owned firms are run by regional and central bureaucracies and are subject to intervention by the Communist Party (Chang and Wong, 2004). Management roles and boards of directors are frequently filled with political appointees, diluting the ranks of professional management (Cuervo and Villalonga, 2000). These firms are often organized in pyramid structures organized to facilitate state control (Fan, Wong, and Zhang, 2005). In addition, however, state-owned firms have well-developed networks of resources, especially financing, on which they can draw (Nee and Matthews, 1996; Tian and Estrin, 2008). Although other types of owners may have access to these networks through social connections (guanxi), access through state ownership should be stronger and more extensive (Peng and Luo, 2000).

Private-sector ownership

Private ownership in emerging economies in general produces higher firm performance, although with variance across countries (see Estrin *et al.*, 2009; Megginson and Netter, 2001, for reviews). Cuervo and Villalonga (2000) explain this effect as a function of change in the following areas during privatization: (1) management; (2) corporate

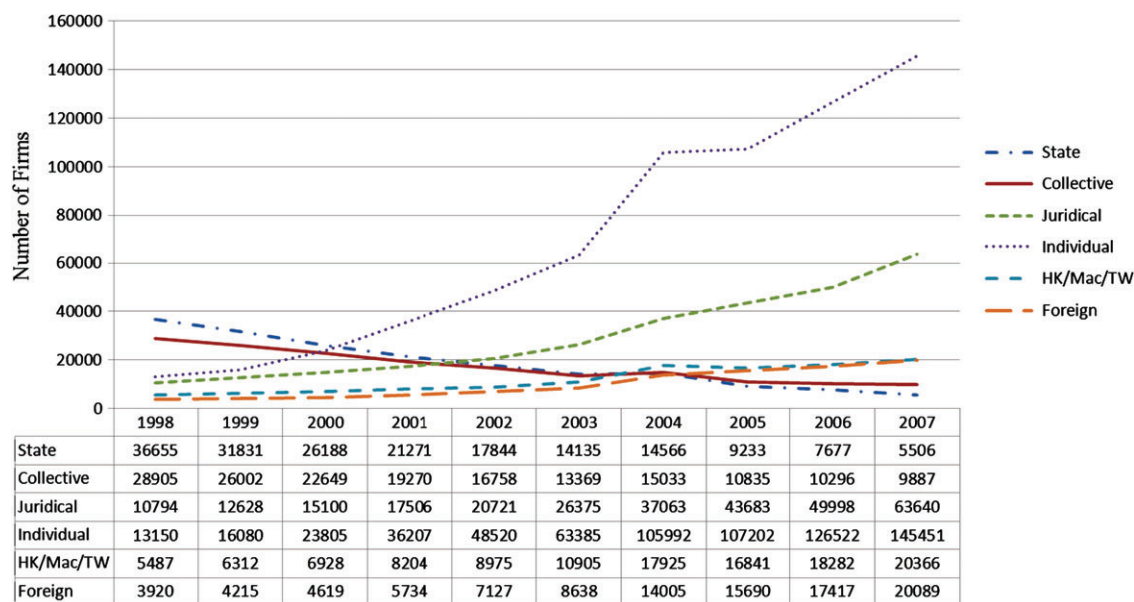|	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
State	36655	31831	26188	21271	17844	14135	14566	9233	7677	5506
Collective	28905	26002	22649	19270	16758	13369	15033	10835	10296	9887
Juridical	10794	12628	15100	17506	20721	26375	37063	43683	49998	63640
Individual	13150	16080	23805	36207	48520	63385	105992	107202	126522	145451
HK/Mac/TW	5487	6312	6928	8204	8975	10905	17925	16841	18282	20366
Foreign	3920	4215	4619	5734	7127	8638	14005	15690	17417	20089

Figure 1. Number of firms in each governance type—all regions 1998–2007 (governance types represent 100% ownership of firm equity)

governance; (3) goals, incentives, and control; (4) strategy, structure, and culture. Several studies have found superior private sector performance in China (Bai *et al.*, 2009; Dougherty, Herd, and He, 2007; Keister, 1998). Private-sector firms in China are commonly owned by individuals with family support and are strongly oriented toward reinvestment in the enterprise (Cull and Xu, 2005). Some firms may be organized as pyramids, but the motivation for this structure is not the same as it is for state-owned firms. Rather, pyramids in the private sector facilitate internal funding, which is necessary to compensate for the poor availability of bank financing (Fan *et al.*, 2005; Herd, Pigott, and Hill, 2010; Tsai, 2002). Also, privately-held companies must develop their own external sources of technology from scratch and rely on technology spillovers from each other, unlike state- or foreign-owned firms (Xia and Walker, 2014). So even though their governance routines may not be constrained by government or multinational bureaucracies, firms in the private sector face the costly process of building regional networks for sourcing labor, technology, material, and financial inputs.

Foreign ownership

Foreign ownership in emerging economies has been found to contribute to firm performance; but again

the results are mixed. The influence of foreign ownership has been attributed primarily to the transfer of capabilities to host country subsidiaries (Javorcik, 2004). Using cross-sectional data on Indian public firms, Douma, George, and Kabir (2006) showed that firms whose shares were held more by foreign corporations had higher performance. In contrast, Konings (2001) found that, controlling for temporal and firm effects, the influence of foreign ownership varied among Eastern European countries. In China, Wei, Xie, and Zhang (2005) found that a greater foreign equity ownership predicted a higher Tobin's Q, but their sample was publicly held firms only. Since the policies and objectives of foreign-owned firms are determined in part by their corporate parents, the governance of a foreign-owned unit will be determined in the context of the parent's goals for its growth and profitability (Rosenzweig and Nohria, 1994). As for external resource networks, multinational units, analogous to those owned by the state, have relationships within the parent corporation to draw upon for technical and managerial knowledge. But these networks are different from those within the state bureaucracy in two ways. First, they have developed in competitive global markets, in contrast to the parochial local histories of technological development within the state. Second, the network of each foreign owner is specific to it alone and not generalizable to other foreign-owned firms within

the region. To the extent its parent has superior governance practices and technological resources, a wholly owned foreign enterprise may perform more effectively than local firms. But this is not assured, since foreign firms must learn local mores and tastes to compete.

PROPOSITIONS

In this paper we ask both *whether* ownership explains variation in performance and also *how much* variance it explains, compared to other factors. To answer these questions, we decompose the variance in performance into constituent elements, following earlier work of this type (McGahan and Porter, 1997; Rumelt, 1991). Variance components studies have generally followed two approaches. The first is exploratory and produces results that are informative for further research, especially theory building (Brush, Bromiley, and Hendrickx, 1999; McGahan and Porter, 1997; Rumelt, 1991). The second method is to state hypotheses based on prior research (Khanna and Rivkin, 2001; Walker, Madsen, and Carini, 2002). Our method here is a hybrid. It is exploratory and meant to produce stylized facts for further research. But we also state propositions that are pertinent to the Chinese economy, specifically to its federalist structure and trend in privatization.

First, the literature discussed above clearly indicates that *we should expect a significant percentage of variation in firm performance to be explained by the firm's owner type*. Assessing the effect of state/private/foreign ownership here is analogous to tests of corporate versus free-standing ownership and group versus nongroup ownership in earlier studies (Rumelt, 1991; Khanna and Rivkin, 2001). The present study differs from this earlier research in that we embed corporate and group effects in the private sector and add state and foreign owners.

Second, regions within a country can differ markedly in their economic and institutional characteristics. Huang's (2008) book powerfully describes these disparities in China. He argues that such differences are due to variation in the relative successes of private firms and state-owned enterprises (see also Fligstein and Zhang, 2009; Witt and Redding, 2012). *Therefore*, *a significant percentage of the variance in firm performance should be due to the interaction of owner type and region*.

Third, Figure 1 shows that during the 10 years of our data, the long anticipated growth of the private sector in China took off, dramatically altering the distribution of owner types in a particular industry, region, and year. This shift in the distribution is important since, as Xia and Walker (2014) show, owner types manifest agglomeration effects, meaning that the influence of a type is heightened when it is present in an industry/region in higher numbers. *Owner type should therefore be interacted with time to explain variation in firm performance*.

Fourth, during the last decade and before, the privatization of state enterprises occurred at different rates across regions (Gan, Guo, and Xu, 2010). Variance among regions of this kind is a key descriptor of China's system of political decentralization. Agglomeration economies should therefore vary geographically as well as temporally, and *the interaction of owner type, time, and region should explain a significant percentage of the variation in firm performance*.

Fifth, the effect of owner type on firm performance should vary by firm size. The reason is that larger firms acquire resources and build legitimacy through more extensive external networks (Hannan, 1998), which, in the case of the state ownership and ownership by foreign multinationals, are shaped by the owner's bureaucracy. Also, the characteristics of a firm's internal formal structures and informal networks, which owners penetrate to exercise control, are to a large degree a function of firm size (Kimberly, 1976; Nelson and Winter, 1982). Therefore, variance *in firm performance may be influenced by the interaction of owner type and size*.

EMPIRICAL SETTING AND DATA

Our focus is on the relative contribution of ownership type to firm performance in Mainland China across 31 regions (27 provinces plus the 4 municipalities directly under the Central Government—Beijing, Shanghai, Tianjin, and Chongqing) from 1998 to 2007. During this period the country grew at between 8 and 10 percent per year, an extraordinary rate, and the national government privatized firms that were owned by the state and by regional and local collectives, a trend that has been analyzed extensively (see e.g., Bai *et al.*, 2009).

Our data come from the National Bureau of Statistics of China and cover manufacturing firms with annual sales with more than five million RMB (about 600–700,000 U.S. dollars) in 30 two-digit manufacturing industries. Several other studies have used earlier versions of data from this source to examine foreign investment both direct and through joint ventures (Buckley, Clegg, and Wang, 2002; Chang and Wu, 2009; Li, Zhou, and Zajac, 2009). Notably, our data include years 2006 and 2007, which are new to analyses of the NBS dataset. Our sample exceeds 330,000 firms. We analyze only firms that are owned 100 percent by an owner type to avoid the problem of conflict among majority and minority shareholders (see Demsetz and Villalonga, 2001). The performance measure is Return on Assets (ROA). The ownership categories in the data are as follows:

State ownership

There are two kinds of state-related ownership in the data: (1) direct ownership by the state, defined at six levels of government; and (2) ownership by the firm's employees ("collective" ownership), typically organized as a workers' union, which is related to local government control.

Private ownership

Likewise, in our data there are two types of private ownership: (1) ownership by private individuals, including families and consortia; and (2) ownership by nongovernmental institutions such as corporations, equity funds, and banks. This definition excludes TVE's (township enterprises), following Haggard and Huang (2008).

Foreign ownership

Finally, there are two kinds of foreign owner: (1) ownership by firms based in Hong Kong, Macao, or Taiwan, which share a cultural background with mainland China; and (2) ownership by principals in other countries.

METHOD

To assess the contributions of ownership and other factors, we estimate a linear model of variance components. Because of the size of the dataset, we run the model within regions and separately within industries and report and compare the results for each. Estimating the components within regions allows us to estimate an industry component, consistent with earlier variance decomposition studies which focus on corporate ownership (McGahan and Porter, 1997; Rumelt, 1991). Estimating the model within industries allows us in turn to estimate a regional effect as well as its interaction of region with ownership and time.

The model for the 30 two-digit manufacturing industries[1] within each region is presented in (1). In the analysis of regions within industry, industry is replaced by region. For brevity, we do not present the regression version but only the standard variance components expression (for a study that presents both, see Rumelt, 1991). σ_{itkos} is the variance in the ROA of firm (i) in time period (t) in industry (k) for owner type (o) and size category (s).

$$\sigma_{itkos} = \text{firm}_i + \text{year}_t + \text{industry (or region)}_k$$
$$+ \text{owner}_o + \text{size}_s + \text{owner} \times \text{size}_{os} + \text{owner}$$
$$\times \text{year}_{ot} + \text{owner} \times \text{industry (or region)}_{ok}$$
$$+ \text{year} \times \text{industry (or region)}_{tk} + \text{owner}$$
$$\times \text{industry (or region)} \times \text{year}_{okt} + \text{error}_{itkos}$$
$$(1)$$

Following earlier studies (McGahan and Porter, 1997; Roquebert, Phillips, and Westfall, 1996; Rumelt, 1991; Walker *et al.*, 2002), we estimate the components with the MIVQUE0 method in SAS. This estimator has been shown to have the lowest bias when data are highly unbalanced and when the ratios of the variance components to the error term are very small (Swallow and Monahan, 1984), both of which conditions we have here. In variance components analysis, the variables are independent of each other, avoiding the problems of interpretation that arise in nested data (see Rumelt, 1998). In our data, firms are nested within region and industry. To estimate standard errors, which MIVQUE0 does not produce (see Khanna and Rivkin, 2001), we

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[1] The industry code variable we use is based on the National Economy Industry Classification system by the National Bureau of Statistics of China. This system's standard changed from "GB/T 4754-1994" to "GB/T 4754-2002" during the time period studied (the newer system was effective on January 1, 2003). To be comparable, all the industry codes in the 10-year period studied have been standardized based on the new "GB/T 4754-2002" system.

jackknife the variance components (see Mosteller and Tukey, 1977).

Our dataset exhibits a minor but perceptible problem of extreme values in the dependent variable that may be due to reporting errors. We correct for these values by removing cases more than three standard deviations from the 10 years' mean ROA for each region separately, in effect winsorizing the data. This process is standard for outliers that are potential artifacts of data collection (Cohen *et al.*, 2003).

An advantage of variance components analysis is that it allows us to distinguish between statistical and substantive significance. First, regarding statistical significance, we set the likelihood of Type 1 error at 0.05. However, since each industry or region is an independent sample, we need to correct for family-wide error; to do so, we use the Bonferroni method and divide 0.05 by 30 or 31 (for industries and regions, respectively), which results in a corrected significance level of 0.0017, and consequently a critical ratio of four. Also, using the binomial distribution, we calculate the number of industries/regions required to show that probability of finding a significant component estimate at 0.0017. The result of this calculation is that *only one* industry or region is required. That is, if the number of industries or regions with significant estimates is one or more, we can reject the null hypothesis (at 0.05) that the variable has no influence on the performance of Chinese manufacturing firms in any industry/region. Second, regarding substantive importance, we assess the size of a variable's effect qualitatively through the magnitude of its percentage contribution. Even though a component is highly significant statistically, it may be quite small substantively, as we will observe.

RESULTS AND DISCUSSION

Figure 1 shows the trend in ownership over the 10 years, dominated by a strong drop in the number of state-owned enterprises, with most being transferred to private owners, primarily individuals. The number of firms owned by Hong Kong/Macao/Taiwan principals and other foreign entities also increased substantially during this period. Interestingly, the data show that a few firms shift back to being state-owned, so this category is replenished to a very small degree.

Table 1 presents two sets of results. First, the right columns show that the regions differ substantially

in growth rate and number of firms. In 1998, the correlation between growth and firm number is 0.63, suggesting early economic differentiation among the provinces. The average firm growth rate was 6.75 percent. Second, the central columns in Table 1 present the percentage contributions of each variable estimated *across industries within each region*. These results are summarized at the bottom of the table. Table 2 presents a comparable summary of the percentage contributions of each variable estimated *across regions for each industry*. While Table 1 shows the industry effect, Table 2 shows the regional effect.

The hypothesis that ownership influences performance is supported in both tables. In Table 1, owner type influences firm performance in every region but Tibet, where no variable is significant, and Zhejiang. This result is mirrored in Table 2 which shows that owner type significantly affects performance in 26 industries. The average percentage contribution of owner type for the interregional analysis is 6.78 and for the interindustry analysis, 4.11. One might be surprised at the small size of these effects. However, they are greater than the contribution to performance of corporate versus independent ownership. Rumelt's (1991) study of U.S. manufacturing firms found that corporate ownership contributed less than one percent to performance, and McGahan and Porter (1997), also of U.S. firms, found an effect of 4.3 percent.

As for the interaction of ownership and region, Table 2 shows that this interaction is significant in half the industries, a pattern that is mirrored in the remarkable variation in the ownership estimates across regions in Table 1. When the jackknife values of the Table 1 estimates are regressed on regional dummies, geographical differences in ownership effects are strong ($F(30, 279) = 4443.69$, $p < 0.001$). It is worth pointing out, however, that the substantive importance of the region-ownership interaction is quite small (1.33%), much less than the average effect for region itself, 5.45 percent.

The interaction of ownership and time is very weak. In both tables, the percentage contribution is less than one; and in Table 2, it is not statistically significant in any region. We can conclude then that the powerful trend in privatization does not materially moderate the effect of owner type over the 10 years of our data.

Notably, adding region to the interaction between ownership and time markedly increases the effect. Table 2 shows that this three-way interaction is

Table 1.   Percentage contributions of variance components. Analysis by regions. Dependent variable: firm ROA

Regions	Variance components											No. of firms (2007)	CAGR (1998−2007)
	Firm	Year	Ind	Owner	Size	Size×own	Year×own	Ind×own	Yearr×Ind	Yearr×Ind×own	Error		
ZheJiang	39.9*	0.34*	0.92*	0.46	1.53*	2.47*	0	0	0.10	0.14	54.1*	42036	19.7
GuangDong	23.7*	0.89*	0.39*	2.08*	0.77*	0.025	0.43*	0.23*	0.17	0.052	23.7*	36377	13.9
JiangSu	34.2*	3.39*	0.87*	0.14*	2.53*	3.36*	0.39	0.73*	0	0	54.4*	35618	14.7
ShanDong	41.4*	3.88*	0.26*	1.98*	5.43*	0	1.46*	0.80*	0.78*	0	44*	29953	17.8
LiaoNing	26.9*	3.46*	0.302*	4.65*	1.05*	1.89*	0	0.36	0.18	0	61.3*	12604	13.4
FuJian	23.6*	5.11*	0.644*	1.73*	1.11*	1.95*	0	2.86*	1.74*	0.724	60.5*	12347	14.4
ShangHai	33.5*	0.49*	0.30*	1.94*	0.61*	0.48*	0.21	0.44	0.47*	0.004	61.5*	11825	8.76
HeNan	40.8*	15.9*	0.643*	12.4*	2.96*	0.455*	2.03	1.72*	0	0.312	22.7*	10397	6.85
HeBei	48.1*	1.74*	1.02*	6.88*	6.75*	1.61*	0	0.67	0	0.699*	32.6*	8059	5.75
SiChuan	23.9*	8.93*	0.332	6.87*	0.659*	0.245	0	0	0.895	0.441*	57.8*	7807	12.4
HuNan	26.8*	9.38*	1.48*	11.9*	3.34*	2.45*	0	0.72	0.653*	1.02*	42.2*	7083	11.1
HuBei	33.9*	0.037	0	6.73*	4.22*	0.982*	2.16*	2.56*	0.88	0	48.6*	6974	5.94
AnHui	32.7*	1.76*	0.651*	4.14*	1.67*	0	0	2.8*	1.85*	0	54.4*	6386	14.4
JiangXi	25.7*	9.62*	0.245	14*	0.177	2.84*	0	1.28*	3.68*	0.329	42.1*	4726	9.11
TianJin	22.6*	0.239	0.935*	7.6*	6.69*	13.2*	3.94*	0	0	0.959	43.8*	4583	2.43
BeiJing	29.8*	0	0.371	1.64*	0	1.8*	0.345	1.09*	0.228	1.09*	63.6*	4460	4.8
GuangXi	26.2*	4.22*	1.75*	9.7*	0	0.38*	0	0	1.65*	1.02	55.1*	3290	6.3
JiLin	25.2*	5.15*	0.5	12.4*	0.0287	0.564	0	0.437	1.48	0	54.3*	2940	4.68
ChongQing	28.7*	7.5*	2.18*	10.2*	2.43*	0	0.806	2.56	0	0	48.2*	2917	9.49
HeiLongJiang	31.1*	0.578	0.291	11.8*	1.16*	0.391	2.13*	2.56	1.8	0.845	47.4*	2221	0.49
Inner Mongolia	19.3*	5.67*	0.466	3.56*	0.517	0.543	0.487	4.17*	2.01	0	63.3*	2115	11.6
ShaanXi	29.7*	0.772	0	12.9*	0	0	2.2	2.76*	2.28*	0	49.4*	2064	2.86
ShanXi	25.8*	0.794*	1.95*	5.3*	2.96*	0	0.111	0	0.824	1.04	64.2*	1915	0.029
YunNan	18.7*	3.37*	1.38*	9.21*	0	0	0	0.778	2.41*	2.34	58.8*	1600	1.93
GuiZhou	20.5*	0.658	0.383	1.28*	0	0.354	0.212	1.69	3.22*	2.74*	69*	1396	1.13
GanSu	31.5*	0	1.24*	9.87*	6.77*	1.76	2.64*	0.671	0.974	0	44.5*	1200	3.81
XinJiang	26.3*	4.65*	2.5*	14*	1.04	0	0	0	0.409	0.728	50.4*	906	−2.9
NingXia	26.7*	1.48	1.65	6.39*	0.134	0	0	6.45*	7.26	3.32	46.6*	520	6.79
HaiNan	25.5*	1.18	3.95	9.06*	2.62	0	0	0	1.72	0	56*	316	0.07
QingHai	20.8*	7.19*	1.98	5.96*	1.34	0.79	1.84	0	0	0	60.1*	261	−0.58
Tibet	11.3	0	0	3.52	0.85	0	2.81	0	6.48	0	75*	43	−11.8
Avg. %	28.2	3.5	0.954	6.78	1.91	1.24	0.781	1.15	1.42	0.574	51.9		
No. of stat sig regions	30	21	18	29	18	13	6	11	10	5	31		

*Critical value > 4 calculated from Jackknife analysis.

Table 2. Average percentage contributions of variance components. Analysis by industries. Dependent variable: firm ROA

	Variance components										
	Firm	Year	Region	Owner	Size	Size × owner	Year × owner	Region × owner	Year × region	Year × region × owner	Error
Avg. %	32.4	1.78	5.45	4.11	2.12	1.37	0.945	1.33	4.11	2.12	44.6
No. of stat sig industries*	27	22	26	26	19	11	0	10	18	11	25

*Critical value > 4 calculated from Jackknife analysis.

significant in 11 regions; and the average estimate across industries is 2.12 percent. Adding the federalist system to the owner-time interaction thus roughly doubles its effect. As expected, geography in China plays a major role in the ways owner types govern their holdings, now over time. The preservation of agglomeration economies in the state sector and their establishment in the private sector therefore depends on the region in which privatization occurs.

The interaction between ownership and firm size is significant in 13 industries (Table 1) and 11 regions (Table 2). But the average percentage is around one. Thus, within specific industries and regions, large and small firms are statistically different but substantively similar in the extent to which they are subject to ownership influences.

We can compare our findings for three variables—year, industry, and firm—with two well-known variance components studies of U.S. firms. Looking first at year effects: Rumelt's (1991) estimate is virtually 0, and McGahan and Porter's (1997) is 2.39 percent. Our estimates (3.5 and 1.78%) are greater than Rumelt and bracket McGahan and Porter, suggesting that exogenous factors affecting manufacturing profitability in China were stronger than in the U.S.

The difference for the industry effect between the U.S. and China is much larger: 8.32 percent (Rumelt) and 18.68 percent (McGahan and Porter) in the U.S. compared to 0.954 percent in China (in Table 2). One interpretation is that in China structural factors are more similar across manufacturing industries. This might be so for several reasons. First, the expansion of domestic and export markets may have focused most manufacturing firms solely on capacity expansion; second, with privatization, industries may have developed similarly; third, firms may have favored labor costs over capital to about the same degree.

Finally, firm effects in McGahan and Porter (31.71%) roughly match those in China—28.2 percent in Table 1 and 32.4 percent in Table 2. Rumelt at 46.37 percent is higher. The strength of these effects is striking even as ownership variables are included in the analysis.

One comment on our analysis might be that the firm and ownership effects confound each other. However, variance components are drawn from independent distributions, which means that adding (subtracting) a variable to (from) the analysis should not affect the other estimates. In this regard,

we find that the average difference in the ownership effect between models with and without the firm effect is -0.006 percent, and the average difference in the firm effect between models with and without ownership in the analysis is -0.09 percent. These very small differences indicate that in our analysis the ownership and firm effects influence performance separately.

In sum, our results provide statistical evidence regarding the effect of owner type in China. The direct effect of owner type is significant and pervasive across regions and industries but not very large in percentage terms, consistent with earlier research on corporate versus free-standing businesses. More importantly, ownership interacts with region and time, reflecting the decentralized implementation of privatization in China. We also show that the strength of the owner effect is sensitive, to some degree, to firm size. Finally, our study is the first that examines a full complement of owner types in decomposing the variation in performance. In this respect, we expand this literature to include a general, multi-category governance dimension with potential applicability to large countries, such as Russia, Brazil, and India, whose markets are emerging and growing rapidly and which play an increasing role in global commerce. We also provide statistical benchmarks for further research on ownership in economies of this kind.

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