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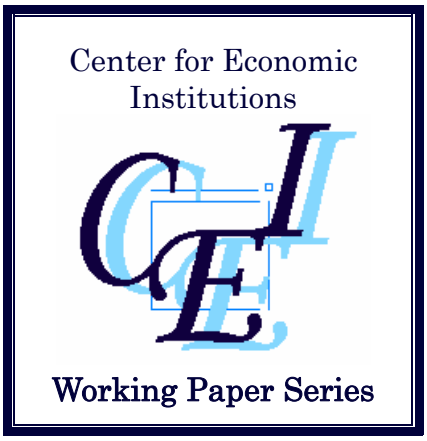

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Corporate Diversification in China: Causes and Consequences

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Abstract

We examine the diversification patterns of almost all publicly listed non-financial companies in China during the 2001 to 2005 period. More than 70 percent of the firms in our sample are diversified. We document that patterns of diversification strongly depend on firms' political connections. Former local bureaucrats are more likely than other CEOs to enter multiple industries. This effect is particularly pronounced in state-owned enterprises (SOEs) that operate in weak institutional environments. These companies are particularly prone to entering low-growth, low-profitability, and unrelated industries. Consequently, the performance effects of diversification differ sharply across SOEs and private firms. While the latter earn a premium from diversifying their operations, SOEs do not. Our results are consistent with the view that provincial and local governments push Chinese SOEs into unattractive sectors of the economy and that politically connected CEOs use their relationships to build corporate empires.

JEL Classifications: D23; G32; G38; K42; P26; P31
Key Words: Corporate Diversification; Institutions; China

1. Introduction

Hunan Jinjian Cereals Industry Co. Ltd (HJCI) was China's first cereal producer to list on the Shanghai Stock Exchange in May 1998. HJCI produces and processes grains and oils, a business in which the firm has earned a reputation as the "No.1 brand of rice." After its initial public offering, the company entered five additional lines of business in the next 5 years, including pharmaceutical products, real estate, dairy production, electric power generation, and sewage control. What compelled HJIC to transform itself from a focused company to one with such widely diversified operations? To what extent does the company's choice of industries reflect the will of its dominant owner, Hunan Province's Agriculture Bureau? And does it matter that the company's board members and management team have all been government officials? These are the central questions that we study in this paper.

Analyzing how government ties influence strategic decision making contributes to our understanding of the link between political connections and firm value. There is now a growing literature which documents that politically well-connected firms outperform companies without relationships (Dinc, 2005; Fisman, 2001; Johnson and Mitton, 2003; Faccio, 2006; Faccio, Masulis, and McConnell, 2006; Khawaja, and Mian, 2005.) These relationships appear to be particularly valuable in emerging markets such as China. Firms can benefit in many ways from their connections: they receive preferential access to markets and financing, they sell to government entities at lucrative prices, and they are protected from domestic and foreign competition.

However—as a large number of political scandals indicate—the benefits of being politically connected often come at a cost. In many business environments, connected

companies are expected to pay bribes in exchange for favorable treatment. Direct payments to government officials aside, connections can also be costly if firms' strategic options are constrained by political relationships. For example, connected companies in Indonesia tended not to list their shares abroad because they did not wish to be scrutinized by foreign regulators and analysts (Leuz and Oberholzer-Gee, 2006). As a result, these firms gave up the capital cost advantages of global financing.

In this study, we are interested in these strategic costs of connections. Do the strategic decisions of connected firms differ systematically from the decisions of other companies? And if so, what are the performance consequences of such decisions? While there are many papers on the link between connections and firm value, the literature has not paid much attention to the mechanisms that underlie the two variables and we know very little about the strategic consequences of receiving government support.

In this study, we use companies' diversification policies as an example for a major strategic decision that might be influenced by political connections. There is a long and distinguished literature on the performance effects of diversification (Lang and Stulz, 1994 and many others), which documents that some forms of corporate diversification improve financial performance while others waste resources (Stein, 1997; Scharfestein, 1998; Rajan, Servaes, and Zingales, 2000; Maksimovic and Phillips, 2003). Diversifying firms are most likely to add value if they capitalize on unique resources that cannot be otherwise transferred across firm boundaries through contractual arrangements (Coase, 1937; Penrose, 1959; Williamson, 1985; Montgomery, 1994).

Because successful diversification hinges on scarce resources, it is a priori difficult to say if connections improve or worsen the performance consequences of

diversification. On the one hand, firms' connections represent a valuable resource, indicating that connected firms might perform well in industries that are unattractive for companies without connections. For instance, connected companies that receive preferential financing might do particularly well in capital-intensive industries. On the other hand, it is also easy to imagine that government connections might be costly. For example, government officials might encourage connected companies to enter labor-intensive industries that generate a large number of jobs. If these industries are structurally unattractive, being connected might worsen corporate performance.

To study the performance consequences of firm diversification in China, we examine the strategies of almost all publicly traded non-financial firms during 2001 to 2005. More than 70 percent of our sample firms are diversified. Our results indicate that, in the Chinese context, politically motivated diversification strategies come at a significant cost to their owners. State-owned enterprises (SOEs) with strong political connections are likely to diversify into low-growth, low-profitability, and unrelated industries. These strategic decisions ultimately result in poor performance. China's private sector firms diversify as vigorously as SOEs, and private firms also pursue more aggressive diversification policies if they are politically connected. However, unlike SOEs, private firms' diversification patterns lead to superior performance.

The paper proceeds as follows. We review the literature and develop our hypotheses in section 2. Section 3 reports the empirical results, and section 4 concludes.

2. Corporate Scope and Political Connections

2.1. The Literature

Why firms diversify is extensively researched by economists and management scientists. It has been argued that firms diversify to capitalize on non-contractible unique resources (Penrose, 1959) such as managerial talent (Chandler, 1977; Montgomery, 1994) or organizational capability (Matsusaka, 2001), to bypass external markets subject to distortion (Williamson, 1985; Stein, 1997), to exercise monopoly power (Hill, 1985; Villanonga, 2000), or to reduce risk (Lewellin, 1971; Khanna and Yafeh, 2005). Whereas the deployment of scarce resources is expected to improve performance, there are many ways in which corporate diversification can misallocate capital (Stulz, 1990; Lamont, 1997; Scharfstein, 1998; and Rajan, Servaes, and Zingales, 2000). Misguided diversification can reflect the misalignment of incentives between top and divisional managers (Aron, 1988; and Rotemberg and Saloner, 1994) and an agency problem more generally (Jensen, 1986; Denis, Denis, and Sarin, 1997; Aggarwal and Samwick, 2003).

Early studies on the performance effects of diversification tended to find that diversification was detrimental to firm value (Lang and Stulz, 1994; Comment and Jarrell, 1995; Berger and Ofek, 1995; Servaes, 1996; Lins and Servaes, 1999; among others). However, more recent studies, after controlling for firm and industry heterogeneity, often fail to find significant effects (Hyland, 1999; Villalonga, 2000; Maksimovic and Phillips, 2002; Campa and Kedia, 2002; and Graham, Lemmon, and Wolf, 2002).

There is also a substantial literature on the performance effects of diversification in emerging markets (Lins and Servaes, 2002, Fauver, Houston, and Naranjo, 2003; Claessens, Djankov, Fan, and Lang, 2003, 2004; Claessens, Fan, and Lang, 2006). Because it is more difficult to write contracts and engage in exchange across corporate borders in these business environments, companies with a wider scope might outperform

more narrowly focused enterprises (Almeida and Wolfenzon, 2006; Khanna and Palepu, 2000; Khanna and Yafeh, 2006).

Political rent-seeking is another important determinant of the scope of emerging-market companies (Morck, Yeung, Wolfenzon, 2004). While there is substantial evidence that political connections raise firm value on average (Dinc, 2005; Fisman, 2001; Johnson and Mitton, 2003; Faccio, 2006; Faccio, Masulis, and McConnell, 2006; Khawaja, and Mian, 2005), we are not aware of any other studies that have looked at government influence on corporate diversification policies.

2.2. Political Connections in China

A key difficulty in documenting the influence of political connections on corporate policies is to find a plausible way to measure connectedness. In this paper, we use two such measures. First, we distinguish between state-owned enterprises and private firms. Private-sector companies play an increasing role in China's economy, but even today, the majority of publicly listed companies are state controlled. While no firm in China operates outside the government's sphere of influence, we assume the ownership difference implies different degrees of government control. China is well-known for having chosen a set of industries in which it plans to play a major role. For instance, the central government has declared car production a "pillar industry." To the extent that governments encourage existing firms to enter strategically important industries.

In addition to ownership, we use managers' political ties as our second measure of government influence. Many companies are led by politically connected CEOs who served as bureaucrats in the central or in local governments (Fan, Wong, Zhang, 2007).

For both SOEs and private firms, these managers' ties might indicate that firm policies are more influenced by political considerations. We expect firms with ties to be more diversified.

Whereas political connections are likely to encourage scope extensions, we do not have a clear hypothesis about the performance consequences of politically motivated diversification policies. There are some reasons to believe that connections might help diversification performance. Politically connected entrepreneurs might be able to enter industries in which their companies will do well. If they diversify at the government's request, these firms might also benefit from preferential financing and protectionist measures. But there are also reasons to believe that the performance of connected firms might suffer because governments push firms into industries for reasons other than their profitability. For example, government officials might expect connected firms to help jump start local industries.

2.2.3. Institutional factors

While government officials might be interested in diversifying their industrial base, the cost of diversification varies with firms' institutional environment. China's highly decentralized political and economic systems provide large variation in institutional environments across its provinces and special districts, while its language, culture, and social norm remain unified. This provides a natural setting to examine how institutional constraints affect firm boundaries.

A first influence is government quality. It is too optimistic to assume that China's local bureaucrats are all benign and efficient. We expect poorer-quality governments to

be more likely to push firms into diversification projects that these firms may not otherwise undertake. Poorer-quality government may also induce private firms to create larger internal markets, so as to mitigate a more difficult business environment.

A second factor is financial-sector development. Banks remain the primary external source of financing for most firms in China. China's banks, all state controlled, are known for their soft lending policies that favor SOEs and for their bias against providing funds to the private sector. We expect that firms located in China's regions of poorly developed financial sectors diversify more than firms in more developed financial markets. SOEs diversify because they have access to soft loans. Private firms diversify to allocate capital internally, thus bypassing the weak external financial markets.

3. Sample and Data

We start with all companies that are listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange during 2001 to 2005 period. The China Securities Regulatory Commission requires that publicly traded companies disclose segment information for all business segments comprising more than 10% of consolidated sales, assets, or profits. The available information typically includes an industry designation, a description of the company's products and services, as well as segment sales, costs and profits. We manually collect these data from annual reports starting in 2001. Data for prior years are available, but the reporting quality is considered poor.

From this sample, we exclude companies for which segment and industry information is incomplete. We also omit financial services firms from our study because their financial statements are not easily comparable to those of other companies. With

these sample selection criteria, we obtain data for almost 1,300 firms and 5,724 firm-year observations.

We obtain financial data for our sample firms from the China Stock Market and Accounting Research (CSMAR) financial statement database. The annual reports of Chinese companies contain a brief biographical sketch of the CEO, listing previous positions in industry and government (Fan, Wong, and Zhang, 2007). From these reports, we manually collect information on whether a CEO held a position in a central or local (provincial) government. We complement this information with provincial-level institutional data that come from various sources, including the China Information Bank and the China National Bureau of Statistics.

3.1. Variables

3.1.1. Diversification patterns

We measure firm *diversification* as the number of business segments in which a company operates, using 3-digit Standard Industry Classification (SIC) codes. We also estimated our models with a 2-digit and 4-digit classification and found qualitatively similar results. As Table 1 documents, 73% of sample firms are diversified. The median company operates in two segments. Rates of diversification remain stable over time. We come to similar conclusions when we compute a Herfindahl index of firms' segment sales: there is no indication that the concentration of sales evolves over time.

3.1.2. Institutional variables

We create two indicators for political connections. We identify a CEO as politically connected at the local level if the executive is or has been a local government bureaucrat. Similarly, we consider a CEO to be politically connected at the central level if the executive is holding or held a position as a bureaucrat in the central government.

To study if the influence of political connections on firm diversification varies with a company's institutional environment, we create two measures: *financial market development* and *government quality*.

Financial market development captures the openness of provincial financial markets. We employ a credit ratio to measure such openness, which equals to the credits provided to private sector scaled by total credits of financial institutions in a province. Our measure of *government quality* is an index of government size, namely the fraction of the population in a province that is *not* employed in the government bureaucracy. We would argue that government size is a reasonable proxy for government quality because organizational redundancy and excess employment have been widespread across China's governmental agencies. The institutional variable, financial market development, is transformed using the formula $(V_i-V_{min(2001)})/(V_{max(2001)}-V_{min(2001)}))*10$, and government quality is transformed using the formula: $(V_{max(2001)}-V_i)/(V_{max(2001)}-V_{min(2001)}))*10$; where V_i is the original value, $V_{min(2001)}$ is the minimum V_i among all the provinces/special districts in 2001, the base year of our investigation period, and $V_{max(2001)}$ is the maximum V_i among all the provinces/special districts in 2001. Data for the two institutional indices are available annually from 2001 to 2005. Table 2 reports summary statistics for the variables used in this study. Appendix 1 provides a summary of the variable definitions and data sources.

4. Results

We start by studying how political connectedness influences firms' diversification decision. We estimate the following model:

(1) $Diversification_{it} = \alpha_1 Connection_{it} + \alpha_2 Institution_{it} + \alpha 3 Connection_{it} * Institution_{it} + \alpha_4 Size_{it} + t + \eta_i + \varepsilon_{it}$

In addition to the covariates discussed above, we add to this regression the log of firm assets (*Size*) and a time trend (*t*), which we implement as year indicators. All specifications in this paper include firm fixed effects, η_i. As a result, the effect of interest, the coefficient a_1, is identified from CEO turnover. That is, we are asking whether the degree of diversification changes in response to changes in the connectedness of the chief executive. This specification has the advantage that it controls for time-invariant unobservables that might influence diversification, for example the firm's industry and the location of the company.

Panel A of Table 3 reports the regression results based on the full sample. As expected, larger firms are more diversified. In specification (1), we find that local connectedness encourage diversification. This pattern holds in all the models that we estimated. We also investigate the effect of former bureaucrats who served in the central government on diversification, but don't find any significant results. Consequently, we only include the local connections variable in subsequent models.

The effect of local connections on diversification is positive and highly significant throughout the different model specifications in Panel A of Table 3. Next, we ask whether the provincial institutions help determine diversification policies. Interestingly

in column (2) it shows that the more developed is the financial market, the more diversified are firms. It seems that firms are more able to diversify when they have good access to credit. This is contrary to the traditional story about financial constraint in firm diversification. Furthermore, the interaction results show that good government quality reduces the impact of local connections on firm diversification.

Political connections might have different effects for private and state-owned firms. Panels B and C of Table 3 report estimates for these two subsamples. The results for the state-controlled firms are quite similar to the full-sample results. Connections also lead to more aggressive diversification of private firms, although this effect does not seem to depend on the quality of firms' institutional environment.

4.1. Performance Effects of Diversification

Politically connected firms in China, both state-owned and private, diversify more aggressively than companies without connections. For state-owned firms, this effect is particularly pronounced in provinces with weak institutions. In this section, we study the performance consequences of diversification. We begin by taking a look at the industries in which diversified firms decide to compete.

4.1.1. Growth

Firms are likely to perform better if they compete in quickly growing industries. Political connections might either help or hurt companies; help if executives can use their connections to enter attractive industries, hurt if governments push connected companies

into unattractive segments of the economy. We estimate models that are similar to specification (1):

(2) $Growth_{it} = \alpha_1 Connection_{it} + \alpha_2 Institution_{it} + \alpha_3 Connection_{it} * Institution_{it} + \alpha_4 Size_{it} + t + \eta_i + \varepsilon_{it}$

$Growth_{it}$ is the sales-weighted historical three-year average growth rate of all segments in which the firm operates. Although segment growth rates do not vary by firm, $Growth_{it}$ varies within firm over time because companies enter and leave segments. As a result, we can estimate (2) with firm fixed effects η_i. As in our earlier models, the effect of interest α_1 is identified from changes in connections over time which reflect CEO turnover.

Table 4 reports the results of these growth regressions. Firms with connections operate in slower-growing industries. As before, we can ask if private and state-owned firms behave differently (Panel B). Surprisingly, we find that connections lower the growth of state-owned companies. This is consistent with the predication that governments push SOEs into unattractive industries for the reasons other than economic factors. Taking institutions into account, we find that better institutions improve SOEs' growth prospects. As suggested by the positive interaction terms, in provinces with more developed financial markets and fewer bureaucrats, connected CEOs are less prone to operate in low-growth segments of the industry.

The results for private companies are interesting. Connection helps private firms enter high-growth industries. Furthermore when government is bureaucratic, connected private firms are more likely to seek rents and enter high-growth industries, as suggested by the statistically significant interaction term.

4.1.2. Profitability

In Table 5, we replace the growth variable with a measure of profitability, a similarly constructed segment-sales-weighted industry ROS. In Panel A, we find hgiher government quality leads companies to diversify into higher-profitability industries. Panel B reports sub-sample findings. Overall, connection tends to bear no relation to the profitability index. As in the earlier panel, there is some evidence that politically connected SOEs are more likely than unconnected SOEs to diversify into lower profitability industries when financial market are underdeveloped, as suggested by the positive coefficients on the interaction term. This is a possible result of 'soft budget constraint', the problem is exaggerated if firms are politically connected. Conversely, the interaction result of sub-sample private firms shows that political ties help them overcome the financing difficulties in less developed markets and diversify into industries of historical profitability patterns.

4.1.3. Relatedness

A common finding in the corporate strategy literature is that diversified firms perform better if they operate in closely related industries. We construct a relatedness variable of '*Complementarity*' employing commodity flow information in the national economy's input-output matrix.[1] The procedure involves two steps. First, we compute for each of the 124 industries defined in the 1997 Chinese input-output table the percentage of its output supplied to each intermediate industry k, denoted as b_{ik}. For each pair of

[1] Our approach is a modified version of Fan and Lang (2000).

industries *i* and *j*, we compute the simple correlation coefficient between b_{ik} and b_{jk} across all *k* except for *i* and *j*. A large correlation coefficient in the percentage output flows suggests a significant overlap in the markets to which industries *i* and *j* sell their products. For each pair of industries, we also compute a simple correlation coefficient across industry input structures (for all *k* except *i* and *j*) between the input coefficients v_{ki} and v_{kj}. Here, a large correlation coefficient between two industries suggests a significant overlap in inputs. We then define a relatedness coefficient which is simply the maximum of the two correlation coefficients.

In a second step, we construct a firm-level complementarity measure as the sales-weighted average of the relatedness coefficients of a company's segments, excluding same-segment pairs. This measure is defined as $C = \frac{1}{n-1}\sum_{i=1}^{n} w_i \sum_{j \neq i} C_{ij}$, where w_i is the sales weight of segment *i*, and C_{ij} is the relatedness coefficient between segment *i* and *j*.[2]

Table 6 reports the regression results for this relatedness variable, '*Complementarity*'. The negative coefficients of 'local connection' mean that political connection reduces the relatedness of firms' industries. In panel A the results show that institutional factors have little direct effects on relatedness. However, the interaction terms between connection and government quality is positive and significant. This evidence is consistent with the view that, in poor institutional regions with low quality government, politically connected firms are more likely to diversify into unrelated industries than are unconnected firms. Broken up by state versus private ownership, we

[2] The sum of the sales-weighted relatedness coefficients is divided by *n* - 1 to account for the effect that the weighted sum increases with the number of segments. For example, consider a three-segment firm with equal sales weight (1/3). Assuming the relatedness coefficients for pairs of the segments are all 1. Then the weighted sum of the relatedness coefficients is 2. Dividing the weighted sum by 2 (3-1) will scale back the relatedness index to 1. Unadjusted, the sum would rise with the number of segments.

find that these interaction effects are primarily attributable to SOEs (Panel B). This result further supports our claims that political connection is sometimes costly. Under the influence of local governments, SOEs are more likely enter unrelated industries. There is little evidence that private firms are similarly subject to these constraints.

In summary, the results in Tables 4-6 cast some doubt on whether politically connected Chinese firms diversify to improve their financial performance. This is particularly true for state-owned companies. When the CEOs of these enterprises are politically connected, they are more likely to diversify into industries with lower growth potential and profitability, and into industries that are less related to one another. These patterns are even stronger for state-owned enterprises that are located in provinces with lower financial market development and poor government quality. By contrast, the diversification patterns of private firms are much less subject to the influences of institutional factors.

4.1.5. Diversification Performance

While it is interesting to study what types of industries politically connected firms enter, the performance consequences of such entry are difficult to predict. Although our data show that state-owned enterprises tend to enter more difficult segments of the economy, the political connections of these companies might help them outperform their rivals in these slow-growing, less profitable industries. In this section, we analyze the performance consequences of diversification more directly by estimating the following system of equations:

(3) $$Diversification_{it} = \alpha_1 Connection_{it} + \alpha_2 Size_{it} + t + \eta_i + \varepsilon 1_{it}$$

(4) $Performance_{it} = b_1 Connection_{it} + b_2 Diversification_{it} + b_3 Size_{it} + t + \eta_i + \varepsilon 2_{it}$

Equation (3) is a variant of the models that we estimated in Tables 3-6. These results show that connected firms tend to be more highly diversified. As (4) indicates, both connections and the degree of diversification are likely to have an influence on the financial performance of companies. To estimate (4), we assume that cov($\varepsilon 1_{it}$, $\varepsilon 2_{it}$)=0. This assumption holds as long as performance has no influence on connections or diversification. The former must be true—CEO's political connections were formed in the past and current performance cannot influence the likelihood of having served in a local bureaucracy. Similarly, performance at time *t* might influence future diversification, but it cannot influence the contemporaneous number of segments in which the firm operates. Under these assumptions, (3) and (4) form a recursive system that can be estimated using OLS.

We use three proxies for the performance of our sample firms, ROS, ROA and excess value. ROS and ROA equal to net earning divided by total sales and total assets, respectively. Similar to the definition in Berger and Ofek (1995), excess value is the natural logarithm of the ratio of firm actual value to its imputed value. We calculate a firm's imputed value as the sale-weight sum of the imputed values of its segments, with each segment's imputed value equal to its industry median ratio of firm value to total assets. Table 7 reports these results. For private companies, corporate diversification improves financial performance and increases market value. This is not the case for state-owned enterprises, for which diversification bears no relation to profitability and firm value. This result may seem surprising in view of our earlier finding that SOEs tend

to enter structurally unattractive industries. One interpretation is that connected CEOs both hurt and help their companies. They hurt performance because they enter more difficult segments of the economy, but—conditional on having diversified in this particular manner—CEO's connections might help improve performance by securing access to finance and markets.

As Table 7 documents, political connections also influence firm performance over and above their impact on diversification. CEOs who are former bureaucrats perform worse when they run state-owned enterprises (see also Fan, Wong, and Zhang, 2007), but there is no such effect for private companies.

5. Conclusion

We have examined the diversification patterns of publicly listed firms in China, finding that the great majority of these firms operate in diversified industries. We also document that firms' diversification levels are closely related to their ownership structure, government influence, and institutional strength of their business environment.

State-controlled firms led by a CEO with local connections tend to diversify more aggressively than otherwise unconnected SOEs. In contrast, we find no evidence that former central government bureaucrats pursue distinct diversification policies. The locally connected SOEs diversify even more when they confront poorly developed financial markets or poor-quality government. SOEs, especially those led by locally connected CEOs whose companies are located in weak institutional regions, are prone to

diversify into low-growth, low-profitability, and unrelated industries. Despite these challenges, SOEs' diversification performance is neutral. However, their political connections with bureaucrats in general are associated with poor performance outcome.

China's listed private firms also diversify more when their CEOs are politically connected. However, their diversification patterns are little influenced by institutional factors, and there is no evidence that political connections and institutional factors affect the choice of industries into which the private firms diversify. There is also no evidence that political connections are detrimental to private firms' performance. Indeed we find that diversification by private firms is on average associated with better accounting performance.

The findings in this paper suggest two causes of firm diversification in the Chinese context. First, diversification can be the result of a government push into unattractive industries. This idea is consistent with our finding that local but not national connections matter for diversification policies. There is ample anecdotal evidence that local and provincial governments strive to be present in particular industries. For example, all but two provinces have entered car assembly, with the result that most plants remain subscale and unprofitable. In contrast to local and provincial governments, central government officials might be more agnostic as to the particular location of an industry.

A second possibility is that the patterns of diversification of state-owned enterprises reflect empire-building on the part of former bureaucrats. Because these CEOs are likely to face a soft budget constraint—and many of them will be able to count

on protectionist policies that shield their firm from competition—they pursue more careless diversification policies. As a result, these CEOs forgo the diversification premium that we find for private companies. This idea is consistent with our observation that SOEs diversify more aggressively in weak institutional environments.

In our view, both motivations—government push and managerial empire-building—are likely to operate simultaneously in the Chinese business environment. To assess the relative importance of these mechanisms is an interesting task for future research.

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Table1 Summary Statistics

This table presents the pattern of Chinese firms' diversification. Segment number is the number of a firm's business segments sharing different 3-digit Standard Industry Classification (SIC) codes. Herfindahl index is the sum of the squared values of each segment's sale as a fraction of total firm sales in a firm. Multiple segments is a dummy variable equal to one if a firm has multiple segments.

Variable	Obs.	Mean	Median	Std.	Min.	Max.
Segment number						
2001	992	2.6069	2.00	1.5170	1.00	10.00
2002	1076	2.6310	2.00	1.6048	1.00	12.00
2003	1144	2.6757	2.00	1.6203	1.00	11.00
2004	1252	2.6957	2.00	1.6508	1.00	12.00
2005	1260	2.6921	2.00	1.6541	1.00	13.00
Total	5724	2.6633	2.00	1.6141	1.00	13.00
Herfindahl index						
2001	992	0.7499	0.8121	0.2405	0.2049	1
2002	1076	0.7467	0.7903	0.2436	0.1756	1
2003	1144	0.7463	0.802	0.2432	0.1702	1
2004	1252	0.7466	0.8	0.2421	0.1705	1
2005	1260	0.7528	0.8165	0.2404	0.1467	1
Total	5724	0.7485	0.8021	0.2419	0.1467	1
Multiple segments						
2001	992	0.7399	1.00	0.4389	0.00	1.00
2002	1076	0.7230	1.00	0.4477	0.00	1.00
2003	1144	0.7273	1.00	0.4456	0.00	1.00
2004	1252	0.7316	1.00	0.4433	0.00	1.00
2005	1260	0.7286	1.00	0.4449	0.00	1.00
Total	5724	0.7299	1.00	0.4440	0.00	1.00

Table 2 Descriptive statistics

This table provides the summary statistics of our key variables. 'Segment number' is the number of a firm's business segments sharing different 3-digit Standard Industry Classification (SIC) codes. 'Herfindahl index' is the sum of the squared values of each segment's sale as a fraction of total firm sales in a firm. 'Multiple segment' is a dummy variable equal to one if a firm has multiple segments. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Financial market development' and 'Government quality' are provincial-level institutional indices as defined in Appendix 1. 'Size' is the natural logarithm of firm assets. 'Growth' is the sales-weighted historical three-year average growth rate of all segments in which the firm operates. 'Profitability' is the sales-weighted historical three-year average ROS of all industry segments in which the firm operates. 'Complementarity' is a relatedness variable constructed following the method of Land and Fan (2000).'ROS' is defined as net earnings divided by total sales. 'ROA' is defined as EBIT divided by total assets. 'Excess value' is defined as the natural logarithm of the ratio of firm actual value to its imputed value.

Panel A Firm characteristic

Variable	Obs.	Mean	Median	Std.	Min.	Max.
Segment number	5724	2.6633	2.0000	1.6141	1.0000	13.0000
Herfindahl index	5724	0.7485	0.8021	0.2419	0.1467	1.0000
Multiple segment	5724	0.7299	1.0000	0.4440	0.0000	1.0000
Local connection	5724	0.1705	0.0000	0.3761	0.0000	1.0000
Financial market development	155	5.7690	5.9900	3.2368	0.0000	12.2200
Government quality	155	4.9392	5.6400	3.7655	-11.9400	10.4400
Size	5724	21.110	21.024	0.9663	16.884	26.978

Panel B Firm performance

Variable	Obs.	Mean	Median	Std.	Min.	Max.
Growth	5719	0.3953	0.2312	0.6839	-0.3159	11.6585
Profitability	5721	-0.1915	-0.0211	0.7242	-9.4889	5.5664
Complementarity	5724	0.5136	0.3985	0.3585	-0.0358	1.0000
ROS	5724	-0.0565	0.0457	0.6258	-4.9186	0.4922
ROA	5689	0.0323	0.0461	0.0928	-0.4993	0.1951
Excess value	5568	0.1121	0.0066	0.4369	-0.6740	6.0378

Table 3 Determinants of diversification

The dependent variable is 'Segment number' measured as the number of a firm's business segments sharing different 3-digit Standard Industry Classification (SIC) codes. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Financial market development' and 'Government quality' are provincial-level institutional indices as defined in Appendix 1. 'Size' is the natural logarithm of firm assets. Year dummy variables are included in the regressions. t-statistics are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Panel A Full sample

	(1)	(2)	(3)
Local connection	0.177***	0.177***	0.534***
	(3.23)	(3.23)	(3.61)
Financial market development		0.026**	0.029***
		(2.41)	(2.66)
Government quality		-0.021	-0.015
		(-0.90)	(-0.65)
Local connection * Financial market development			-0.016
			(-1.49)
Local connection * Government quality			-0.044**
			(-2.12)
Size	0.411***	0.409***	0.413***
	(10.07)	(10.01)	(10.10)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	5724	5724	5724
R-squared	0.86	0.86	0.86

Panel B SOEs

	(1)	(2)	(3)
Local connection	0.136**	0.135**	0.638***
	(2.06)	(2.05)	(3.39)
Financial market development		0.041***	0.044***
		(3.26)	(3.43)
Government quality		-0.020	-0.008
		(-0.73)	(-0.28)
Local connection * Financial market development			-0.018
			(-1.37)
Local connection * Government quality			-0.067***
			(-2.59)
Size	0.284***	0.282***	0.290***
	(5.78)	(5.74)	(5.90)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	4342	4342	4342
R-squared	0.87	0.87	0.87

Panel C Private firms

	(1)	(2)	(3)
Local connection	0.301***	0.300***	0.192
	(2.70)	(2.69)	(0.75)
Financial market development		-0.007	-0.009
		(-0.34)	(-0.39)
Government quality		-0.018	-0.018
		(-0.36)	(-0.36)
Local connection * Financial market development			0.006
			(0.27)
Local connection * Government quality			0.012
			(0.34)
Size	0.688***	0.685***	0.685***
	(9.21)	(9.12)	(9.11)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	1382	1382	1382
R-squared	0.85	0.85	0.85

Table 4 Industry growth

The dependent variable is 'Growth' equal to the sales-weighted historical three-year average growth rate of all segments in which the firm operates. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Financial market development ' and 'Government quality' are provincial-level institutional indices as defined in Appendix 1 'Size' is the natural logarithm of firm assets. Year dummy variables are included in the regressions. t-statistics are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Panel A Full sample

	(1)	(2)	(3)
Local connection	-0.098*	-0.098*	-0.310**
	(-1.93)	(-1.93)	(-2.27)
Financial market development		-0.000	-0.002
		(-0.00)	(-0.20)
Government quality		0.014	0.010
		(0.63)	(0.47)
Local connection * Financial market development			0.010
			(1.00)
Local connection * Government quality			0.026
			(1.35)
Size	0.208***	0.209***	0.207***
	(5.53)	(5.56)	(5.50)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	5719	5719	5719
R-squared	0.34	0.34	0.34

Panel B Industry Growth, by type of ownership

	SOEs			Private firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Local connection	-0.175***	-0.175***	-0.867***	-0.064	-0.063	0.541*
	(-3.23)	(-3.22)	(-5.62)	(-0.48)	(-0.47)	(1.76)
Financial market development		-0.007	-0.010		0.028	0.033
		(-0.63)	(-1.00)		(1.04)	(1.21)
Government quality		-0.013	-0.030		0.051	0.051
		(-0.59)	(-1.33)		(0.85)	(0.85)
Local connection * Financial market development			0.024**			-0.019
			(2.25)			(-0.69)
Local connection * Government quality			0.093***			-0.084**
			(4.37)			(-1.98)
Size	0.237***	0.236***	0.225***	0.140	0.150*	0.146
	(5.88)	(5.84)	(5.58)	(1.55)	(1.65)	(1.61)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4337	4337	4337	1382	1382	1382
R-squared	0.36	0.36	0.36	0.35	0.35	0.36

Table 5 Industry profitability

The dependent variable is 'Profitability' equal to the sales-weighted historical three-year average ROS of all industry segments in which the firm operates. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Financial market development' and 'Government quality' are provincial-level institutional indices as defined in Appendix 1. 'Size' is the natural logarithm of firm assets. Year dummy variables are included. t-statistics are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Panel A Full sample

	(1)	(2)	(3)
Local connection	0.022	0.022	0.057
	(0.49)	(0.48)	(0.56)
Financial market development		-0.000	-0.003
		(-0.04)	(-0.27)
Government quality		0.037**	0.040**
		(2.16)	(2.28)
Local connection * Financial market development			0.012
			(1.29)
Local connection * Government quality			-0.019
			(-1.45)
Size	0.068	0.071	0.071
	(1.36)	(1.47)	(1.45)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	5721	5721	5721
R-squared	0.35	0.35	0.35

Panel B Industry profitability, by type of ownership

	SOE			Private		
	(1)	(2)	(3)	(4)	(5)	(6)
Local connection	0.017	0.017	-0.036	0.040	0.044	0.298
	(0.44)	(0.45)	(-0.34)	(0.44)	(0.47)	(1.56)
Financial market development		-0.008	-0.012		-0.007	-0.001
		(-0.61)	(-0.97)		(-0.34)	(-0.04)
Government quality		0.005	0.008		0.120***	0.123***
		(0.22)	(0.38)		(3.13)	(3.16)
Local connection * Financial market development			0.021**			-0.034*
			(2.11)			(-1.88)
Local connection * Government quality			-0.014			-0.008
			(-1.05)			(-0.28)
Size	0.028	0.029	0.027	0.160	0.178*	0.180*
	(0.64)	(0.67)	(0.64)	(1.46)	(1.68)	(1.73)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4339	4339	4339	1382	1382	1382
R-squared	0.36	0.36	0.36	0.38	0.39	0.39

Table 6 Fixed-effect regression results of diversified firm segments' industry relatedness

The dependent variable is the relatedness variable of 'Complementarity', as defined in Appendix 1. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Financial market development' and 'Government quality' are provincial-level institutional indices as defined in Appendix 1. 'Size' is the natural logarithm of firm assets. Year dummy variables are included in the regressions. t-statistics are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Panel A Full sample

	(1)	(2)	(3)
Local connection	-0.036*	-0.036*	-0.118***
	(-1.94)	(-1.94)	(-2.84)
Financial market development		-0.004	-0.004
		(-1.25)	(-1.29)
Government quality		0.005	0.004
		(0.78)	(0.52)
Local connection * Financial market development			0.001
			(0.41)
Local connection * Government quality			0.013**
			(2.26)
Size	-0.072***	-0.071***	-0.072***
	(-4.54)	(-4.50)	(-4.55)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Observations	5724	5724	5724
R-squared	0.78	0.78	0.78

Panel B Sub-samples by ownership

	SOE			Private		
	(1)	(2)	(3)	(4)	(5)	(6)
Local connection	-0.040*	-0.040*	-0.132***	-0.019	-0.019	-0.029
	(-1.80)	(-1.79)	(-2.58)	(-0.51)	(-0.51)	(-0.39)
Financial market development		-0.006	-0.006		0.001	0.001
		(-1.50)	(-1.50)		(0.14)	(0.17)
Government quality		0.007	0.004		0.007	0.007
		(0.87)	(0.50)		(0.46)	(0.48)
Local connection * Financial market development			0.001			-0.002
			(0.24)			(-0.32)
Local connection * Government quality			0.015**			0.004
			(2.06)			(0.52)
Size	-0.049***	-0.048***	-0.050***	-0.121***	-0.120***	-0.119***
	(-2.81)	(-2.78)	(-2.85)	(-3.68)	(-3.60)	(-3.59)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4342	4342	4342	1382	1382	1382
R-squared	0.80	0.80	0.80	0.77	0.77	0.77

Table 7 Fixed-effect regression results of diversification performance

The dependent variable is ROS, ROA and excess value, alternately. 'ROS' is defined as net earnings divided by total sales. 'ROA' is defined as EBIT divided by total assets. 'Excess value' is the natural logarithm of the ratio of firm actual value to its imputed value. 'Segment number' is the number of a firm's business segments sharing different 3-digit Standard Industry Classification (SIC) codes. 'Local connection' is a dummy variable equal to one if a firm's chief executive officer (CEO) is or has been a local government bureaucrat. 'Size' is the natural logarithm of firm assets. Year dummy variables are included in the regressions. Clustered standard errors by province are estimated. t-statistics are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Panel A Financial performance

	ROS			ROA		
	Full sample	SOEs	Private firms	Full sample	SOEs	Private firms
	(1)	(2)	(3)	(4)	(5)	(6)
Local connection	-0.071	-0.082	0.045	-0.020***	-0.001***	0.009
	(-1.20)	(-1.09)	(0.35)	(-2.89)	(-2.81)	(0.74)
Segment number	0.040**	0.016	0.094***	0.002	0.039	0.108*
	(2.27)	(0.99)	(2.76)	(0.62)	(0.54)	(1.74)
Size	0.406***	0.233***	0.730***	0.063***	-0.022***	-0.009***
	(4.29)	(3.32)	(3.20)	(5.17)	(-3.85)	(-3.57)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes	Yes	Yes	Yes
Standard error	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Observations	5724	4342	1382	5689	4315	1374
R-squared	0.50	0.42	0.59	0.52	0.52	0.57

Panel B Market value

	All	SOE	Private
	(1)	(2)	(3)
Local connection	0.004	0.030	-0.004
	(0.10)	(0.79)	(-0.08)
Segment number	0.023**	0.017	0.037**
	(2.24)	(1.32)	(2.06)
Size	-0.099***	-0.043	-0.223***
	(-3.83)	(-1.41)	(-3.72)
Year	Controlled	Controlled	Controlled
Fix effect	Yes	Yes	Yes
Standard error	Clustered	Clustered	Clustered
Observations	5568	4217	1351
R-squared	0.68	0.67	0.76

Appendix 1

Variable Definitions

Variable	Definition	Data source
Segment number	The number of a firm's business segments sharing different 3-digit SIC codes.	Authors' estimation from Annual Reports
Herfindahl index	The sum of the squared values of each firm segment's sale as a fraction of total firm sales.	Authors' estimation from Annual Reports
Multiple segment	A dummy variable equal to one if a firm has multiple segments, or otherwise zero.	Authors' estimation from Annual Reports
Local connection	A dummy variable equal to one if a firm's CEO is or has been a local government bureaucrat, or otherwise zero.	Authors' calculation from Annual Reports
Financial market development	A provincial index is based on the ratio of credits provided to private sector over total credits of financial institutions. The variable is transformed using the following formula: $(V_i-V_{min(2001)})/(V_{max(2001)}-V_{min(2001)}))*10$, where V_i is the original value, $V_{min(2001)}$ is the minimum V_i among all the provinces/special districts in 2001, and $V_{max(2002)}$ is the maximum V_i among all the provinces/special districts in 2001.	Fan and Wang (2006)
Government quality	A provincial index constructed to be inversely related to the number of a local government's bureaucrats and staffs divided by regional population. The variable is transformed using the following formula: $(V_{max(2001)}-V_i)/(V_{max(2001)}-V_{min(2001)}))*10$, where V_i is the original value, $V_{min(201)}$ is the minimum V_i among all the provinces/special districts in 2001, and $V_{max(2001)}$ is the maximum V_i among all the provinces/special districts in 2001.	Fan and Wang (2006)
Growth	The sales-weighted sum of a firm's segments' industry growth estimated by the historical three-year average industry sales growth rate. The annual industry sales growth is the average sales growth rate of all firms in the segment's 3-digit SIC industry.	Authors' calculation from Annual Reports
Profitability	The sales-weighted sum of a firm's segments' industry ROS estimated by the historical three-year average industry ROS. The annual industry ROS is the average ROS of all firms in the segment's 3-digit SIC industry.	Authors' calculation from Annual Reports
Complementarity	A firm-level index defined as the sales-weighted average of the relatedness coefficients of a company's segments: $C = \frac{1}{n-1}\sum_{i=1}^{n} w_i \sum_{j \neq i} C_{ij}$, where w_i is the sales weight of segment *i*. Cij is the relatedness coefficient between industry i and j, the maximum of the correlation coefficient of the two industries' input and output flows.	Authors' calculation from Annual Reports and China's 1997 Input-Output Table
Size	The natural logarithm of firm assets	CSMAR[a]
ROS	The return to assets, defined as net earnings divided by total sales	CSMAR
ROA	The return to sales, defined as net earnings divided by total assets	CSMAR

Excess value	The natural logarithm of the ratio of firm actual value to its imputed value. A firm's imputed value is the sale-weight sum of each segment's industry median ratio of market value to total assets. The industry median ratio is based on the narrowest SIC grouping that includes at least three single-segment firms.	CSMAR

[a] CSMAR is China Stock Market & Accounting Research Database, developed by Hong Kong Polytechnic University and Shenzhen GTA Information Technology Co. Ltd.

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