

Ownership structure and corporate diversification: Empirical study of Chinese small and medium enterprises

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Dong Wang
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Abstract

Purpose

Substantial previous researches find that corporate diversification lead to value erosion. Agency theory was an often-cited explanation to rationale decision maker's motivations toward diversification. With 144 Chinese public companies from the Small and Medium board in Shenzhen Stock Exchange, I explain how agency problems motivate Chinese public firms to diversify.

Data and methodology

Sample firms used in my analysis are selected from Small and Medium board in Shenzhen Stock Exchange. I collect data on the number of business segments in which the listed firm operates in, segment sales data, and some financial figures from Worldscope database. Owner identity and shareholdings of ultimate controller are manually collected from sample firms' annual reports. Managerial and institutional ownership are collected from Wind database. Several OLS regression was executed to analyze their impacts on the diversification level.

Findings

Firstly, I find a significant negative relation exists between managerial ownership and diversification level. This indicates that as the shareholdings of management increase, interests between manager's and shareholder become more aligned, and thus managers are less likely to adopt value-reducing diversification. Second, cash-flow right which proxy the equity stakes of ultimate controller are negatively between cash-flow right of ultimate controller's and diversification level for my sample firms. This provide the evidence on the align effects of interests between ultimate controller and minority shareholders. Third, I document a positive relation between the divergence between the cash-flow right and voting right of ultimate controller's and diversification level. When block holders hold much more voting power than their claims to the cash-flows, they tend to expropriate minority interest via diversification.

Keywords diversification, agency problem, managerial ownership, ultimate controller identity, cash-flow right, separation

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1. Introduction

1.1. Background information

Corporate diversification is the process a company expands from its core business into other industry or product lines (Chandler, 1962; Andrews, 1980). Ever since it was firstly defined by Ansoff in 1950s, diversification has been as an alternative strategy for company growth. Many researches reveal that firms implementing diversification strategy can benefit from several ways, such as enabling the firm obtaining new growth opportunities via investing in more profitable and promising business (Mueller, 1972), reducing the asymmetric of information and allocating resources more efficiently by creating an internal market (Meyers and Majluf, 1984), decreasing cash flow volatility and expanding debt and tax shield capacity (Lewellen, 1971; Shleifer and Vishny, 1992). Diversification became very common among the large corporations from 1950s to 1970s. Rumelt (1974) analyzed the Fortune 500 firms by the year 1974, finding that 14 percent of those firms operated as single business and the rest 86 percent were diversified companies.

From 1990s on, Chinese firms started to diversify their business at very low cost. Many company expansions into related or unrelated business areas from core business are realized through mergers, acquisitions, or new investment. A number of large corporate conglomerates were established as a result. For example, Hair Group, by leveraging its strength and resources in brand, culture, capital etc., entered into air-conditioner, washing machines industries from a purely fridge maker. Wuliangye Group, by acquiring the selected companies, now competes in bio-engineering, pharmaceutical industry, printing, electronics, logistics and transports, which are unrelated with its core alcohol business. Both of the two firms increased size and profits via diversification.

However, just as in any economic activity, costs are also associated with diversification beside the benefits introduced above. A lot of diversified companies did not achieve the expected profits and some even went to bankruptcy rather than success. Many scholars examined diversification's impacts on company performance, and recorded a negative relation between diversification level and company performance. Basing on the widely dispersed ownership structure, several analyses find that diversified American firms are traded at a discount from otherwise similar single-business firms (see, for example, Berger

and Ofek, 1995; Lang and Stulz, 1994). Comment and Jarrell (1995), John and Ofek (1995) documented an increased corporate focus of US firms during the 1980s and reported that the increase in focus is associated with positive stock price performance on the capital market. With more than 1000 firms from 7 emerging markets as the sample, Lins and Seavaes (2002) finds that diversified firms are valued at 7% discount on average than the otherwise single business companies.

1.2. The goal of the study

If diversification is associated with value-reducing phenomenon or bad company performance, why so many firms are still found involved in different business lines? Agency theory was believed to provide the rationale behind of implementation of diversification strategy (see, e.g., Amihud and Lev, 1981; Lins and Servaes, 1999) Misalignment of interests between agent/manger and principal/owner in dispersedly held firms, and between controlling shareholder and minorities in public companies with concentrated ownership are cited to the driver for diversification.

China is going through a transition from a planned economy to a socio-market oriented one. Although the state-owned enterprises (SOEs) still dominate China's economy¹, the government enacts a series of laws and regulations to encourage the development of small- and medium-sized enterprises. Anderson et al. (2003) find that the rapid economic growth of China goes with a relative decline of large state-owned enterprise and an explosive increase of small enterprises. The Small and Medium Enterprise board (SME board) was established to encourage and facilitate the development of Chinese small and medium sized enterprises which may not satisfy the standard to be listed on the main board of Shanghai and Shenzhen Stock Exchanges.

This provides a unique sample to study the governance of Chinese companies, which are different from those listed on the main board. What's more, most previous studies on diversification strategy of the Chinese listed firms focused on investigating the association between company performance and diversification level, with very limited attention given to how the ownership structure impacts the diversification level. In previous studies, the sales data used for calculating diversification index is often manually collected, and definition of

¹ For example, Fan and Wong (2004) shows that percentage of companies with the government as the ultimate controller reaches 76% in their sample.

business segments and classification of those figures are more subjective. Data used in my paper are mostly directly retrieved from Worldscope database, making it more consistent with those studies of western companies. Basing on the assumption of agency theory, I try to answer the following questions:

- a) How managerial ownership is related company diversification level?
- b) Do different types of ultimate controller identity have any implication on diversification level?
- c) What are the relations between shareholdings of ultimate controller's and diversification level?

1.3. Summary of the findings

I provide evidence on the agency cost explanation for the diversification of Chinese public firms on the SME board. Followings are my main findings:

First, I find significant a negative relation exists between managerial ownership and diversification level. This indicates that as the shareholdings of management increase, interests between manager's and shareholder become more aligned, and thus managers are less likely to adopt value-reducing diversification. Second, cash-flow right which proxy the equity stakes of ultimate controller are negatively between cash-flow right of ultimate controller's and diversification level for my sample firms. This provide the evidence on the align effects of interests between ultimate controller and minority shareholders. Third, I document a positive relation between the divergence between the cash-flow right and voting right of ultimate controller's and diversification level. When block holders hold much more voting power than their claims to the cash-flows, they tend to expropriate minority interest via diversification.

The rest of the paper is arranged as follow: section 2 provides some background information of Chinese stock market; theoretical framework and research objectives are portrayed in section 3; section 4 present previous findings regarding diversification within the Chinese corporate governance; section 5 describes the data set; I develop the hypotheses in section 5 and describes the data and define the variables in section 6; section 7 presents methodology

used in this paper, and in section 8, empirical results are provide and analyzed ; section 9 conclude the paper and point out future potential study opportunities.

2. Ownership Structure and corporate diversification in China

In this part, I discuss the relation between ownership structure and corporate diversification strategy within the context of China. I firstly give background information about Chinese rapidly growing economy, with focusing on the inception and development of Chinese stock market. Then background information regarding the ownership structure in China is provided. After that I review previous findings on the corporate diversification among Chinese listed firms. After that, I clearly define the owner identity from ultimate controlling perspective.

2.1. China's rapid growth economy and capital market

The economy development of People's Republic of China experienced two stages: planned economy (from 1949 to 1979) and continuous development of market-oriented economy (from 1979 until now). In order to build the market economy, the Chinese government started to implement the Open and Reform policy in late 1970s. Open policy enables China attract more foreign investors and investment to participate in the construction of the modern Chinese economy; reform policy enable the original state-owned Chinese companies try to seek a way to develop their own modern company systems. Ever since then, the Chinese economy experienced continuous rapid growth for more than three decades. Meanwhile, Chinese companies grow rapidly in size, so do their needs for capital. As one of the most important ways to create more wide financing sources, the Shanghai Stock Exchange and Shenzhen Stock Exchange were established in 1990 and 1991 respectively.

2.1.1. Description of the Shanghai and Shenzhen Stock Exchanges

Synchronized with the booming of Chinese economy during the past two decade, the Chinese stock market undergoes tremendous growth as well. The number of the publicly traded enterprises, trading volume, and total market capitalization has increase dramatically since the opening of the two stock exchanges. Listed companies in SSE and SZSE increases from the initial 13 to 2342 in 2011, with a total markets capitalization \$1.37 trillion (see table 1).

The statistical numbers of World Federation of Exchanges (WFE) reveals that China ranks third only to the U.S and Japan based on the market capitalization of domestic listed-firms (see table 2).

Table 1: Market Capitalization of Domestic-listed Companies by 30 Dec, 2012 (in US \$ million)

1	NYSE Euronext (US)	11795575.5
2	NASDAQ OMX	3845131.6
3	Tokyo SE Group	3325387.8
4	London SE Group	3266418.1
5	NYSE Euronext (Europe)	2446767.5
6	Shanghai SE	2357423.3
7	Hong Kong Exchanges	2258035.2
8	TMX Group	1912121.9
9	BM&FBOVESPA	1228936.2
10	Australian Securities Exchange	1198187.4
11	Deutsche Börse	1184500.2
12	SIX Swiss Exchange	1089519.4
13	Shenzhen SE	1054685.0
14	BME Spanish Exchanges	1030987.6
15	Bombay SE	1007182.9
16	Korea Exchange	996139.9
17	National Stock Exchange India	985269.4
18	NASDAQ OMX Nordic Exchange	842100.9
19	Johannesburg SE	789037.1
20	RTS Stock Exchange	783554.8

Table 2: Summary of the Chinese Stock Market (1992-2011)

Year	No. of listed Firms	Shares Amount Issued (in Millions)	Market Cap. (in million RMB)	Total Assets (in Billions RMB)
1992	53	7322.20	104814.90	48.10
1993	183	32867.50	354152.07	182.10
1994	291	63947.08	369061.68	330.90
1995	323	76563.11	347427.64	429.50
1996	530	111036.04	984238.66	635.20
1997	745	177123.19	1752923.70	966.06
1998	851	234535.36	1952181.21	1240.75
1999	949	290885.19	2647117.52	1610.74
2000	1088	361339.05	4809094.43	2167.39
2001	1160	483835.69	4352220.39	2925.70
2002	1224	546299.21	3832912.86	4152.62
2003	1287	599794.35	4245771.60	5324.63
2004	1377	671473.31	3705556.82	6347.24
2005	1381	716354.05	3243028.14	7271.30
2006	1434	1268399.47	8940389.44	21848.96
2007	1550	1700045.32	32714088.89	41415.16
2008	1625	1890012.52	12136643.60	48689.24
2009	1718	2060625.71	24393912.39	61785.21
2010	2063	2698448.17	26542259.25	86222.73
2011	2342	2974511.39	21475809.59	102884.25

2.1.2. The SME Board on the Shenzhen Stock Exchange

In line with its aim of continued development and perfection of the market economy, Chinese government also enacts series of laws and rules to encourage and facilitate the development of small and medium sized enterprises (SMEs). SMEs experienced golden period of booming development. Take the industrial companies for example. 30-year after implementation of Open and Reform policy, the number of SMEs above Designated Size² reaches 449 000 and provide jobs to 70 560 000 people in 2010, 99.3% and 77.9% of that of all industrial

² Companies above Designated Size are those whose total assets, number of employees, main business income etc. satisfy certain measures. These measures vary according to the industry type and are set by National Bureau of Statistics of China. For example, the measure is all state-owned industrial companies and non-state-owned industrial companies whose annual main business income is larger than 5 million RMB.

companies above Designated Size.³ However, getting external finance for expansion or future development of these SMEs has been always very difficult. Some nonofficial estimates shows that, production from non-state owned section has contributed more than 60% of the whole GDP of China. Contrast to the great contributions, less than 30 percent of the whole loans issued by Chinese financial departments go to the private part.

Small and Medium Enterprise Board (SME Board) was launched in June, 2004. It is a major step toward the establishment of a multi-tier capital market system and paved the way for a second boar market. After seven year's innovation and development, the SME board has become a unique, indispensable and independent segment in China's multi-tier capital market system. It is also the great efforts that SZSE has been making continuously to support independent innovation. Although firms are allowed to issue relatively small securities via this platform, listed enterprises have to satisfy same listing requirements and obey the same rules and regulations with those on the main board. By the end of 2011, 646 companies issue stocks through this platform, with a total market capitalization US \$ 428.6 billion. Total proceeds from these firms' IPO reached US \$ 88.7 billion.

Table 1: IPOs number and capital rose each year from 2004 to 2011

Sources: Based on Shenzhen Stock Exchange Fact Book 2011

³From the 12th "Five-year" Planning for SMEs. Source: Ministry of Industry and Information Technology of the People's Republic of China.

2.2. Ownership structure

2.2.1. Classification of owner identity

Ever since China Security Regulatory Commission (CSRC) made modifications to regulations regarding the disclosure of company information in 2002, all publicly traded companies are required to disclose the ownership information in the annual report. Detailed information, including the name and types of the ultimate controller, structure of the ownership, names and types of top 10 shareholders, individual or legal entity with ownership larger than 10%, has to be disclosed.

A large portion of previous study on the ownership structure of Chinese public companies are basing on the official classification of share types. According to official classification, regardless of which exchanges (Shanghai or Shenzhen Stock exchanges) it is on, a typical listed company has five different types of shares: state shares, legal person shares, employee shares, tradable A-share and B-share (see, e.g., Xu and Wang 1997). The state shares are, directly or indirectly, held by central government, local government, state asset management bureau, or solely state-owned enterprise; with the ultimate owner as the State Council of China and not tradable. Legal person shares are owned by non-individual legal entity or institutions. In the context of China, legal person could be joint-stock companies, industrial enterprises, non-bank financial institutions (such as securities companies, trust and investment companies, foundations and funds etc.), and SOEs that have at least one non-state owners⁴. Legal person shares are non-tradable and transfer of such shares need to gain the approval of CSRC before 2005. After the implementation of Measures for the Administration of the Share-trading Reform of Listed Companies in year 2005, part of the original non-tradable state shares and legal person shares are transferable on the market step by step. For those permitted to be listed, a proportion is still not listed. Tradable A-shares are held and traded mostly by individual and some by domestic institutions. Employee shares are offered to workers and managers of listed SOEs during the process of their ownership structure reform, or issued to by the private-owned enterprise to its workers as an incentive

⁴ According to 'Law of the People's Republic of China on Commercial Banks', Chinese merchant bank is not allowed to own equity of firms directly.

measure. Nowadays, the proportion of the employee shares are pretty small, less than. B-share is issued and traded in different foreign currencies: in SSE in US dollar and in SZSE in Hong Kong dollar. The introduction of B-share in mainland China is to attract foreign capital to China's capital market, so it is not available to Chinese investors. Now 53 listed firm in SSE and 54 public enterprises have B-share. In addition, companies may also choose to list its share in Hong Kong stock exchange or other oversea exchanges. So it's possible for some Chinese corporations have H-share or S-share, etc.

2.2.2. Concentration of shareholdings in China

According to the official classification of share types, a large number of previous empirical studies explored characteristics of Chinese public firm's ownership structure (see, e.g., Xu and Wang, 1999; Wu, 2004; Watanabe, 2010). Xu and Wang (1999) claim that a typical Chinese listed firm has a mixed ownership structure, with three predominant groups of owners---state, legal person and individual. Wu (2004) find that each of the three types of owners holds about 30% of the shareholdings. Watanabe (2010) find that concentrated ownership structure is common among Chinese public companies, with the largest owner holding 35% of the total outstanding shares on average. He also documented that 60% to 80% of listed firms are controlled by the state during 1997 to 2007.

Table 3 presents the shareholding structures of the listed Chinese firms as the end of year 2011. Thanks to the ownership structure reform initiated in 2005, the state and legal person shares become transferable gradually, and the original non-tradable shares decreased substantially, accounting less than 0.3% of outstanding shares in 2011. Compared with finding by Xu and Wang (1999) and Wu (2004), it's easy to find that great changes have taken place in the Chinese capital market. Analyzing the ownership structure according to the official standard might not be reliable anymore. After a careful examination of the ultimate owner identity of various types of shares, Liu & Sun (2005) find that classification of owner identity according to types of shares is ambiguous and far away from accurately revealing the real owner of Chinese firms' stocks. Specifically, the legal person shares can be held by the state-owned legal person, domestic independent legal person and foreign legal person. Therefore, when the largest shareholder is state-owned legal person, the state, rather than the nominal legal person have the ultimate decision right on the firms' strategies, such as diversification. Similarly, individual or family directly or indirectly have significant impacts

on firms' policies when they are in block holding positions. Thus, it is inappropriate to group the legal person as an independent category which is parallel to the state and individual.

Table 3: Shareholding Structure of Listed Firms in China (as the end of 2011)

Nature	Types of shares	NO. of Shares (in Billions)	Ratio
Tradable shares	Listed A-share	223676.34	75.14%
	Listed B-share	2953.26	0.99%
	Non-Listed A-share	70175.45	23.57%
	Non-listed B-share	0.00	0.00%
	Sum of Tradable shares	296805.05	99.70%
Non-tradable shares	State Shares	13.92	0.00%
	State-owned Legal Person Shares	571.66	0.19%
	Domestic Legal Person Shares	195.27	0.07%
	Foreign Legal Person Shares	103.42	0.03%
	Employee Shares	0.00	0.00%
	Others	0.00	0.00%
	Sum of Non-radable Shares	884.27	0.30%
Sum of Total Shares		297689.32	100.00%

In this paper, I follow the spirit of ultimate ownership principle to portrait the ownership structures, avoiding the ambiguity caused by using the official classification. Following the principle of ultimate controlling structure, I find ultimate owners, on average, control 43.77% of total shares in my sample, indicating a highly concentrated ownership of public firms on the SME board. Around 78% percent of the sample firms are ultimately controlled by family, with state controlling the rest 22.22%. Thus, families constitute the dominating controlling group on the SME board. Such a great different situation from Watanabe (2010)'s findings, shows the great variance of ownership structure within the Chinese stock market.

3. Literature review

A few scholars applauding for diversification believe it can better a company from several ways. However, substantial empirical analysis failed to find evidence from the real economic

life to support that. Lins and Servaes (1999) find that, cost associated with diversification outweighs the benefits. In this section, I combine the literature regarding diversification from the following perspective: reasons for diversification, company performance and diversification, and motivations to diversify---agency cost angel.

3.1. Reasons for corporate diversification

Theoretical arguments claiming that diversification is beneficial to the firm under question usually explained the logic from three perspectives: growth opportunities, internal capital market, and increased interest tax shield.

Ansoff defined diversification as one way for a company to seek future growth opportunities. Mueller (1972) contend that firms enjoy different growth opportunities during its life cycle: in the young and growing age, the business has plenty of profitable opportunities to reinvest earning; but in as the firm matures and such opportunities become scares, managers will seek ways to invest accumulated profits in more promising industries to maintain the existence of the company. According to Rumelt (1974), diversification strategy enables firm to avoid the uncertainty of its future cash flows. Beatty and Zajac (1994) find that several tobacco and cigarette companies are forced to diversify to avoid the possible uncertainty during 1990s 'No Smoking' movement. Firms competing in declining industry, for example, in textile and mechanical industry, must diversify to survive over the long run (Wu, 2004).

Myers and Majluf (1984) illustrate that when the cost to raising external finance for positive NPV project is higher than the cost to issue shares at a bargain price, managers acting in the interest of the existing passive shareholders may choose to forgo those projects. Under this circumstance, diversified firm with a large internal capital is less likely to miss those opportunities. Gartner et al. (1994) claimed that such internal financing can also effectively reduce the asymmetric of information and make the monitoring more easily. According to Williamson (1975), manager with more firm-specific knowledge have information advantage over the outside investor. Thus, less information asymmetry ensures the excessive capital of diversified firm will be invested more efficiently.

Both Lewellen (1971) and Shleifer and Vishny (1992) argue that imperfectly correlated earning streams of different divisions of a diversified firm can constrain the volatility of cash flows. In turn, the decreased volatility gives more credentials to the firm regarding its debt capacity. Thus diversified firm can benefits from increased interest tax shield.

3.2. Company performance and diversification

Despite the above mentioned advantages that may be gained from firm diversification, with a focus on the developed market, extensive academic studies investigating the impact of diversification on company performance have found a negative link between the two items (see, e.g., Agrawal et al., 1992; Lang and Stulz, 1994; Berger and Ofek, 1995; Lins and Servaes, 1999). According to Lang and Stulz (1994), Tobin's q of diversified US firms was significantly smaller than that of their undiversified peers. Berger and Ofek (1995) provide evidence that compared with public firms operating in single business lines, diversified American firms are traded at discount of 13 to 15 percent. They also noticed that diversification discount appears to be smaller for related than for unrelated diversification. Morck et al. (1990) investigate whether the internal capital market created via diversification is efficient in allocating corporate resources or not. And they find, during 1980s, acquisitions of new business decrease shareholder wealth. Rajan et al. (1997) report that diversification cause misallocation of funds, resulting decrease in firm profitability.

Several scholars also examined the value-reducing effect of diversification in emerging markets. Young (1995) studies diversification strategies of East Asian companies and find that diversification is related to lower profitability. He argues that as firms diversify into more unrelated business, they may need more time to adapt to new technology. Factors beyond firms' control also detriment the firm from realizing the expected profitable stage of learning. With more than 1000 firms from 7 emerging markets as the sample, Lins and Seavaes (2002) finds that diversified firms are valued at 7% discount on average than the otherwise single business companies.

If, on average, corporate diversification is related to poor company performance and value erosion, why it is widely adopted by companies around the world?

Agency theory might be an explanation. It opens a different angel to understand the motivation of diversification---the cost-driven. There are extensive empirical studies examined the motivation for diversification with focus on the agency cost hypothesis. With different assumptions toward the concentration of ownership, agency problems are generally found, in dispersedly held public firms, between manager and shareholders, and in concentrated companies, between controlling shareholders and minority owners. From the

two perspectives, I will illustrate how agency problems cause the deployment of diversification strategy.

3.3. Agency problems between manager and shareholder cause corporate diversification

Berle and Mean (1932) for the first time argued that in the modern business world, shareholders who legally have ownership over companies have been separated from control of those firms. According to Jansen and Meckling (1976), agency theory proposes that both agent and principle are opportunist and selfish actors who will bear any efforts to achieve their own utility maximization. Whenever the manager owns less than 100 percent of a firm, he is likely to pursue self-interest that is inconsistent with that of owners, bearing only a fraction of cost resulting from his firm value-reducing behaviors. They define the agency cost as the sum of the monitoring and bonding cost plus any residual loss that occurs because of the necessity of the contractual relation. A few scholars claim that principle can limit the divergence between principal and agent by evaluating a manager's performance and determine his opportunity wage, or by creating other approaches, such as incentive arrangement (see, e.g. Beatty and Zajac, 1994; Agrawal and Knoeber, 1996). However, such behavior or policies will induce cost themselves, and thus resulting inefficiency in alleviating agency problems.

Shleifer and Vishny (1997) claim that the dispersed shareholders, who own only small fraction of shares in the company also suffered from asymmetric of information, have little incentive to monitor behaviors of managers. According to Hoskisson and Turk (1990), diffuse ownership encourages free riding on monitoring the performance of managers, because potential losses accrued to atomic owners due to poor management are relatively small, thus rational minority stockholders would not contribute any efforts to supervising behaviors of managers. Meanwhile, managers hired by shareholders may dominate the board and could have significant impacts on company strategies. In such firms, agency problem between the manager and owner might be even more severe. Without efficient mechanisms to alleviate it, manager might tend to adopt strategies or policies, such as value-reducing diversification, which may enrich their own utilities at the expenses of shareholders (see, for example, Jansen, 1986; Morck et al., 1988). Generally, benefits managers enjoyed from deployment of value-reducing diversification can be classified into two categories: reduction of personal risk and gains of self-interests.

3.3.1. *Reduction of personal risk*

Amihud and Lev (1981) try to explain the motivation of conglomerate mergers and find that managers can decrease their largely diversifiable employment risk. The assumption of their analysis is that the labor market is not efficient, managers are not well-monitored and punishment for manager's bad behavior is not perfectly effective. Since manager's income from employment constitutes a major portion of the

ir total income, and it is closely related to the firm's performance, firm's failure to achieve predetermined performance targets can result a great loss to their revenue, an even seriously destroy their reputation and potential employment opportunities. Unlike the normal shareholders, who can efficiently lower risks by diversifying their personal portfolio in the capital market, managers cannot diversify their employment risk efficiently. The risk-averse managers might diversify their employment risky by engaging their firms in conglomerate mergers. May (1995) claim that managers will consider personal risk when making decisions that affect firm's risk. Her empirical study shows a positive relation between ownership stakes and level of diversification.

3.3.2. *Gains of self-benefits*

Denis et al. (1997) argue that, although on average, diversification is associated with reduction in firm value; managers still diversify the firm under their control, because the managers' private benefits exceed cost incurred to them. Theoretically, they enjoy various interests only at the cost to the fraction of shares stakes in the company. Firstly, both Jansen (1986) and Stulz (1990) contend that diversification can benefit managers with the power and prestige of running a larger company. And managerial compensation tends to be higher as the size of company increases (Jansen and Murphy, 1990). The experience of having run some giant diversified company add more credentials to the professional manager when they pursue better positions in the future(Gibbons and Murphy, 1992).Secondly, managers might direct a firm's strategy in a way that increases the firm's demands for his or her particular skill, thus making them indispensable to the firm (Shleifer and Vishny, 1989).

In a nutshell, company diversifications can benefits manager in two ways. On the one hand, diversifying the firm can effectively lower manager's wealth risk vested in the company; on

the other hand, manager can enjoy more self-interest from a more diversified corporation than a focused one.

3.4. Agency problems between block holder and minority shareholder cause corporate diversification

3.4.1. Positive effect on corporate governance of the widespread block holders

Since 1990s, increasing number of scholars noticed the existence of ownership concentration. La Porta et al. (1999) claim that, other than most of American public firms which are owned by many small and dispersed stockholders, corporations controlled by one or a few large shareholders are very common around the world. They collected data on ownership structure of the 20 largest companies from 27 wealthy economies, and traced ultimate controllers of those firms at 20% threshold. Their results showed that most of those firms are controlled by families or state, with relative few are widely held or controlled by financial institutions. Claessens et al. (2000) studied the ownership structure of public firms in East Asia, and Faccio and Lang (2002) did similar analysis to Western European listed firm. Both of them found that more than 50 percent of public corporations have one ultimate owner. Berglof and Pajuste (2003) document the average shareholding of largest owner is 51.2% in Middle and Eastern European transition economies.

In diffusely held firm, misalignment of interests between manager and owners may distort managers' choices toward value-creating corporate strategies. Theoretically, large investors can help alleviate agency problems because they have both interest in getting their money back and the power to demand it. Agrawala and Knoebera (1996) contend that introduction of more concentrated outsider (institutions and block holders) could be one of the potential mechanisms to reduce agency problem. They claim that increased monitoring by those outsiders would help improve performance by a firm's own manager. Hill and Snell (1989) argue that larger shareholder has enough motivation and the power to collect information, thus high ownership concentration can reduce information asymmetric between principles and agent. Bennedson and Wolfenzon (2000) contend that large owners normally have the opportunity to control the management by taking positions or having their representation in the board, or closely monitor the performance of managers. According to Boeker (1992), firms with concentrated ownership have few owners, making coordination between shareholders more feasible and at lower cost. Shleifer and Vishny (1986) argue that the

presence of large majority shareholders provides a partial solution to free-rider problem, reducing the agency cost when manager's interest is not consistent with that of shareholders.

3.4.2. Controlling shareholder's incentives to diversification

If the argumentation in 3.4.1 always holds, block holder and minority stockholder would focus on maximizing the firm value, and thus no conflicts of interest between them will emerge. However, according to Dyck and Zingales (2004), existence of controlling shareholder does not only confer benefits, and sometimes costs goes with it as well. Some scholars also reported that conflicts of interests between controlling shareholder and minorities happens quite often, and controlling shareholder are motivated to gain extra economic benefits at the expenses of the other shareholders in the company (see, e.g., La Porta et al., 1999; Bebchuk et al., 2000; Claessens et al., 2000; Faccio et al., 2001). According to Claessens et al. (1999a), risk reduction incentive can explain part of ultimate controller's motivation toward diversification. With 2000 sample companies from nine East Asia economies, they analyzed the role of ultimate ownership on corporate diversification level. Consistent with their expectation, in the less-developed economies, group-affiliated firms are more likely to diversify than independent firm. They document larger diversification discount for the group-affiliated firms than independent firms, which can be partly explained by the internal market theory. In their later argumentation, the risk reduction and expropriation of minority interests are examined to explain some firms' diversification discount.

3.4.2.1. Risk reduction via diversification

Ultimate controllers usually invest large proportion of their wealth in some specific company and thus not able to diversify their portfolios efficiently as individual investors do in the capital market. Diversification is a mean for block holder to reduce the excessive risks associated with the firm-specific investment. Conflicts of interest between block holders and minorities would emerge. For example, large shareholders would forgo projects with positive net-present-value (NPV) if such projects are overly risky for them to bear. And some negative NPV projects could be choose for only they are less risky. Claessens et al (1999a) contend that such diversification strategies would be adopted to reduce their risks even though they might be essentially harmful to minority shareholders' wealth.

3.4.2.2. Expropriation of minority interest via diversification

In companies with concentrated ownership, controlling shareholders have incentives to expropriate minority shareholders. Shleifer and Vishny (1997) claim that large investors' interests need not coincide with the interests of other investors; and large owners prefer to generate private benefits of control that are not shared by minority shareholders, especially when they gain nearly full control of the company. According to Barclay (1999), in an imperfect market, controllers can dominate the board or general shareholder meeting, passing the decision that allow the transfer of wealth from the public firm to themselves; however, they only need to take the loss to the proportion of shares they own in the firm. Johnson et al. (2000) argue that controller can transfer resources from the firm for his own benefits through 'tunneling', such as self-dealing transactions and financial transactions that detriment shareholder wealth. Fan and Wong (2005) contend that, with effective control over the corporation, controlling owner might deprive the cash flows that are entitled to minority shareholder corresponding to their share investment.

Bozec and Laurin (2008) summarize the reason why expropriation of minority interest exists. Firstly, large stock holders are able to impose their preferences however such preferences might be different from those of minorities (Shleifer and Vishny, 1997). Secondly, controlling shareholders have incentive to increase the socio-political influence via mergers and acquisitions. But suboptimal investment might accompany with such expansions, resulting in erosion of wealth of minority shareholders (Johnson et al., 2000). Third, block holder might take the top management position by themselves or have their own representatives in such positions or on the board. And they need not to be the most capable managers (Caselli and Gennaioli, 2003). Fourth, controlling shareholders have motivation to transfer money or other resource (for instance, business opportunities) from the public firm to other firms controlled by them (Johnson et al., 2000).

Corporate diversification might also be used by block holder to obtain private benefits. Claessens et al. (1999a) show that controlling shareholder's preference for diversification can be explained by expropriation of minority interest. According to their expropriation arguments, self-interested ultimate controllers have incentives to expropriate minorities by making investment that benefit themselves at the expense of minority shareholder. For example, controlling owner can channel corporate resources to projects that could generate more utility for them but little benefits to minorities. They also provide evidence for the claim

that expropriation incentive become stronger when there is divergence between cash-flow right and control right of ultimate controller's.

3.4.3. Cash-flow right, separation between cash-flow right and voting right and diversification

Theoretically, ultimate controllers possessing block shareholdings are capable of expropriating minority interests. However, La Porta et al (2002) argue that, similar to incentive effect of managerial ownership emphasized by Jansen and Meckling (1976), ultimate controller with big shares of equity would avoid shouldering the large proportion of cost resulting from their expropriation behaviors. Their findings suggest that equity or cash-flow ownership can serve as a moderating factor for block holder's incentive to expropriate outside investors. Thus, as the ownership stake of ultimate controller's increases, they are less likely to adopt value-reducing diversification.

However, in situations in which ultimate controllers control the public firms via pyramid structure, they realize control with limited cash investment. There is divergence between cash-flow right and voting right of ultimate controllers. Friedman et al. (2003) argue that higher voting right can enhance controller's incentive to expropriate other shareholders' interest, but higher cash-flow right can offset it. Claessens et al. (1999a) contend that the incentive effects of equity holding would be impaired. The divergence provides ultimate owns more incentive to diversify to reap private benefit, because they can obtain private benefits but bear little of the consequences of reduction in firm value. They document larger divergence between control and cash-flow right is associated with more diversification.

Thus, controlling owners can exert strong influence on managers' decision-making process, with their voting rights or their representation in the management team or on the board. Diversification could be adopted by controlling shareholders to reduce their less-diversified risks and/or expropriate minorities, resulting agency cost. So, in companies with concentrated ownership, agency problems not only exist between managers and stockholder, but also emerge between controlling shareholder and minority investors.

3.5. Owner identity and diversification

Owner can take numerous identities such as government, institutional investors, individual, family, management, employees and so on. By assuming the large shareholders have

identical objective and motivations, many researchers explained why firms diversify with agency theory. However, a few studies show that owner identity has significant implications for corporate strategy (see, for example, Miller et al., 2010; Hautz et al., 2011). According to Hautz et al. (2011), shareholders differ mainly on three dimensions: motivation, capabilities and control. Differences in the three dimensions are attributed to the variation of company's strategy toward diversification.

3.5.1. Family controlled firm and diversification

Anderson and Reeb (2003) find, between 1993 and 1999, founding family owners represent an important class of controlling block holders among the S&P 500 industrial companies. According to Casson (1999) and Chami (1999), public firms founded by family owners are viewed as asset that would be passed to other family members or offspring, thus survival of the firm is extremely important. The nature of family holdings as of committed, long-term and concentrated, and desire for survival strengthen family owners' incentive to mitigate firm risk level via corporate diversification. Faccio and Stolín (2006) record corporate diversification can reduce volatility in earnings which can increase the chance of firm survival. Miller et al. (2010) document that family-owned firms tend to reduce their undiversified wealth portfolio via diversified acquisition. Similarly, Hautz et al. (2011) analyzes family owner's risk aversion preference and suggests that level product diversification is positively associated with family ownership.

However, a steward-perspective argues that family owners may function as the driving factors for company value-maximizing. The substantial negative effects on shareholder value of corporate diversification may lead the family owners, who committed a large, concentrated equity position in the company, to forgo such strategies, because they would suffer severe penalties for failure (Anderson and Reeb, 2003). Stein (1988) demonstrates that shareholders with long investment horizons can mitigate managers' incentive for myopic investment decisions. He found that founding families would avoid diversification deliberately if the family lack of the firm-specific knowledge of an acquisition or new industry. Diversification beyond the family firms' knowledge might increase the uncertainty, thus family ownership may lead to less corporate diversification.

3.5.2. *Financial-institutional controlled firm and diversification*

According to David et al. (1998), financial institutions are a diverse set of organizations, including bank, public and private pension funds, mutual funds and insurance companies. Compared with other owner identities, especially family owner, financial institutions are expected to care more about the economic effectiveness (Thomsen and Pedersen, 2000). David et al. (1998) contend that financial investors essentially investor ‘other people’s money’, and thus bearing the legal obligation to protect their investment from value erosion. Hautz et al. (2011) argue that financial institutions’ nature as investor determined that they are more diversified than the general investors, so they have less need to reduce risks associated with certain investment via diversifying that investment target. What’s more, Jansen (1986) and Pound (1988) believes that financial institutions possessing the analytical skills and information advantages, which can effectively make monitoring of managers more easier. Thus several previous studies record a negative relation between financial institutional ownership and level of diversification. Within the Indian contexts, Ramaswamy et al. (2002) find that ownership by financial institutions and unrelated diversification. They found that Indian banks tend to support managers, even though sometimes, corporate strategies implemented by managers can be detrimental to shareholder wealth. However, except banks, they document financial institutional shareholdings are negatively related to level of unrelated diversification among Indian industrial firms. Hautz et al. (2011) by analyzing the relation between ownership of different owner identities and corporate diversification, reveal that financial institutional holdings are negatively associated with product diversification.

3.5.3. *State controlled firm and diversification*

According to Shleifer and Vishny (1984), the inefficiency of state-owned public firms is the result of political pressures from politician who control them. In their later study, Shleifer and Vishny (1994) contend that, different from families, state ownership is primarily driven by political and social goals. Boycko et al. (1995) explain that social benefits are important for it can affect politician’s pursuit for personal election. As a result, government tends to favor low output prices, higher employment and positive externalities, which are found to be related to weak performance and value erosion in firm value (Thomson and Pederson, 2003) Andrews and Dowling (1998) claim that the arm’s length nature of government ownership provides state-owned institutions less incentive to closely track the performance of their

investments. Zhao (2010) claim that reduction of diversification level of the Chinese business groups will lead to a reduction in head count.

4. Previous findings on corporate diversification in China

4.1. Corporate diversification in China

Ever since late 1980s, the Chinese central government encourages the integration of giant companies via merger and acquisitions of small and low-efficient SOEs. As the result, several conglomerates are established and it gradually becomes a popular practice for Chinese firms to grow rapidly. Diversification becomes common among the Chinese companies. Wu (2004) point out that, competing in such an under-developed and changing environment, Chinese firms diversify to survive or defend their market position. Fan et al. (2007a) compared the business segment number of Chinese firms with those of other firms in nine economies from 2001 to 2005. They find Chinese firms compete in 2.81 business units on average in 2005, and are the most diversified in their sample. With the same Chinese sample firms, Fan et al. (2007b) find that more than 70% of those firms are diversified.

4.2. Firm performance and corporate diversification in China

Although China has experienced rapid growth during the past three decades, the economy is still on the transition to a market-oriented one. According to Khanna and Palepu (1997), China is under-developed in product market, capital market and labor market when compared to the developed countries. McMillan (1996) also points out that capital market discipline is weak and capital allocation was seriously distorted in China. Wu (2004) argue that in such institutional environment that has high risks and uncertainties, diversification can be an alternative to substitute the absence of markets. Firms are able to benefit from internal capital market created via diversification, since it's an efficient way to reduce the high transaction cost from the external market. Based on this explanation, some scholars find a positive relationship between firm diversification and firm performance within the context of China.

Su (2005) study 1026 corporations that went to public before 1999 and document a positive relation between the diversification level and company performance. His study shows that

diversified firms are related to higher market-to-book value, Tobin's q and excessive value. He argues that the changing macroeconomic policies, poor credit system and under-developed regulation systems cause inefficiency in allocation of resources by external market, pushing up the cost if a firm only operates in single business. Internal market can effectively resolve such problems, reduce the transaction cost and relieve the operating risk faced by single-business firms. Lu and Yao (2006) provide evidence that group control mechanism via pyramid ownership structure enable the ultimate controller to expropriate minorities or tunnel corporate resources for its own interest. They find that, in less diversified affiliated companies, cash flow right is positive related to company performance and in the general group control right is negatively related to corporate performance. Chen (2007) document diversification premium with balanced-panel data constructed from a sample of Chinese stock market. She also finds that diversification premium in public firms ultimately controlled by central government are much higher than those controlled by local government. However, no significant diversification discount or premium was found among non-state controlled firms.

On the contrary, some Chinese scholars found the phenomenon of diversification discount. Zhang et al. (2005) analyzed 1032 non-financial Chinese listed firms, and found that diversified firms tend to have lower earnings per shares and are much more likely to experience financial distress. Li and Zhu (2006) show that valuation of firms acquiring unrelated companies would decrease by 6.5% to 9.6% within 1 to 3 years. Zhang et al. (2002) evaluated the performance of 72 diversified Chinese companies, and find the negative association between diversification level and company performance.

4.3. Owner identity, shareholding concentration and corporate diversification

Studies on the relations between ownership structure and diversification level are relatively limited. Yu et al. (2005) find U-shaped relation between diversification levels and management shareholdings of Chinese firms. The turning point of managerial ownership is 52.94 percent. Delios and Wu (2005) investigate how the concentration of legal person shareholdings influences firm's strategy and performance. They document legal person ownership at high level of concentration can reduce firm diversification and increase performance. They explained that, the less developed external capital market, short of legal protection and less informativeness make diversification a profitable strategy rather than value-reducing. Rao et al. (2004) document that the relation between shareholding of the

largest owner and corporate diversification is an inverse U-shape. Similar links are also found between state ownership and diversification, and between legal person shares and level of diversification. They also report that state-controlled firms are more diversified than non-state controlled corporation.

Liu and Sun (2005) examined the impact of ultimate controllers' identity on Chinese listed firms' performance. They argue that downstream firms controlled by state via pyramid structure are least efficient when compared with firms controlled by other owner identities. Zhang et al. (2005) recorded a U-shape relation between diversification level and state shares in state controlled public firms, and no relation is found in non-state controlled companies. Zhao (2010) shows that compared to other ownership structures, government-owned business groups tend to be more diversified, and ownership concentration is related to lower levels of diversification. Zhang and Li (2006) demonstrate that state-owned firms are more likely to implement value-reducing diversification strategies. Dun and Xue (2007) found that diversification strategy was implemented by the ultimate controllers of Chinese private firm to expropriate the interests of other shareholders. Their study also showed that the diversification level increases as the divergence between voting rights and cash-flow rights becomes bigger.

5. Research hypothesis

5.1. Management ownership and level of diversification

Theoretical arguments suggest that, on average, diversification is associated with reduction in firm value. If so, why so many firms remain diversified? Agency theory and convergence-of-interest hypothesis might provide part of the reasons. On the one hand, based on the assumption of widely dispersed ownership, the agency problem between managers and shareholders could explain some diversification. Berle and Mean (1932) for the first time argued that in the modern business world, shareholders who legally have ownership over companies have been separated from control of those firms. The difficulties in coordinating behaviors among the dispersed shareholders and other costs that could be induced from effective monitoring of management behaviors left the firm actually under the control of managers. Misalignment of interests between managers and shareholders provides managers

incentives to obtain self-interests at the expenses of shareholders. Amihud and Lev (1981) claim that managers can reduce their personal risk by diversifying the firm under their management. Both Jansen (1986) and Stulz (1990) contend that diversification can benefit managers with the power and prestige of running a larger firm. Diversification may also increase firm's dependence on manager's specific expertise (Shleifer and Vishny, 1989).

Hi: Negative relation exists between level of diversification managerial ownership.

5.2. Owner identity and the level of diversification

5.2.1. State

According to Shleifer and Vishny (1986), the inefficiency of state-owned public firms is the result of political pressures from politician who control them. Compared with the relative mature market economy in most of the developed countries, Chinese stock market is still in the infant stage of evolution toward socialist-market economy. The government has great impact on the operations of public firms. Many CEOs of Chinese SOEs are original officers who may lack both the experience and expertise to run a modern corporation efficiently. The nature of their identity determines that, despite the great efforts the central government spared to cultivate the modern corporate system during the process of SOE reform, the state still has significantly affects their strategies, serving the government's political concerns. In general, the state has two incentives to enforce the diversification strategies of firms under its control. Firstly, as the administrator, the central governments would love to see a stable society. One most important way has been cited many times by both local and central officials, that is increasing the employment. Zhao (2010) claims that reduction in level of diversification of Chinese government-controlled business groups is positively associated with reduction in head count. Zeng and Chen (2006) denote that state controlled firms tend to employ more than non-state controlled firms. Thus the large employee base of such state-controlled conglomerate provides such firms enough political incentive to avoid increase of unemployment resulting from a decreasing level of unprofitable diversification. Secondly, historically, GDP and fiscal income are extremely key determinant for promotions of officials of each level in China. Diversification into multiple industries to realize fast growth of SOEs has been a very effective option. So I propose the second hypothesis of this study:

H2: State-controlled firms are positively related to the level of diversification.

5.2.2. *Family*

Compared with state-owned public firms, corporations ultimately controlled by family are inspired to diversify for different reasons. According to Zhao (2010), founders of Chinese business groups are usually former farmers, workers, or professionals. Chen et al. (2009) states that, in many Chinese public firms, founders or their family members often take the key positions, such as the CEO and the chairman of board. The detailed knowledge of the industry in which the firm operates in enables the ultimate controller to enter the management team very easily or monitor the behaviors of hired managers more efficiently. Family as the ultimate controller has enough and stronger incentives to monitor the firms they control. However family block holder in the imperfect product and capital market of China has strong incentive to monitor their firms, other concerns may induce them to diversify into unrelated industries. The agency problems between the block shareholders and minority shareholders are more serious among Chinese public companies. Expropriations of minority shareholders via self-dealing transactions dilute the interests of minority shareholders by acquiring additional shares at a preferential price etc. So it can be expected that, when compared with state-controlled firms, family controlled firms may have lower level of unrelated diversification, but still positively related to diversification level.

H3: Compared with firm controlled by state, family-controlled firms have lower level of corporate diversification, but still positively associated with level of diversification.

5.3. *Cash-flow right, separation of control-rights and cash-flow right and level of diversification*

As mentioned in previous arguments about ultimate owner's incentive to corporate diversification, cash-flow right can moderate block holders' incentive to expropriate minority interests. Since controlling shareholders want to avoid the reduction in firm value entitled to them, corresponding to their proportion of shareholdings. As cash-flow right of ultimate controller increase, the interests of ultimate controller become more aligned with that of small investors. Thus, it can be expected the value-reducing diversification level is negatively related to equity stakes of ultimate controller.

Divergence between control right and cash-flow right allow ultimate controller to realize effective control with only little cash investment. A larger separation between the two items

means smaller cost the ultimate controller shall bear resulting from their firm-value reducing diversification. So a greater extent divergence between the voting right and cash-flow right provides ultimate controller more incentive to gain private benefits at the expenses of small shareholder. On the other hand, when the difference between voting rights and cash-flow right becomes smaller, the block holder's interests become more in align with the rest small owners. Costs associated with expropriation, such as transferring the resources of the public firms out will be greater, thus constraining the need to pursue private benefits via diversification.

H4: Cash-flow right is negatively related the level of diversification.

H5: Separation of control right from the cash-flow right is positively related to the level of corporate diversification.

6. Data and definition of variables

6.1. Data source and screening process

Companies listed on the SME board in Shenzhen Stock Exchange as the end of year 2011 are chosen for my analysis. The firm level data needed for the calculation of unrelated diversification proxy and other control variable comes from three sources: the Worldscope database, annual reports from Shenzhen Stock Exchange website and Wind data center⁵.

Ever since China Security Regulatory Commission (CSRC) made modifications to regulations regarding the disclosure of company information in 2002, all publicly traded companies are required to disclose the ownership information in the annual report. Detailed information, including the name and types of the ultimate controller, structure of the ownership, names and types of top 10 shareholders, individual or legal entity with ownership larger than 10%, has to be disclosed. Ultimate controller identity, shareholdings and the control information is manually collected from annual reports; managerial ownership and shareholdings of institutional investors are collected from Wind; product sales figure and

⁵Wind data center is the database provided by Wind Information Co., Ltd (Wind Info), which is a leading integrated service provider of financial data, information, and software. Public firm data used in many academic study of Chinese listed firms by Chinese domestic scholars.

corresponding SIC code as well as other data for the control variable is directly retrieved from the Worldscope database.

By the end of 2011, there are 646 companies listing on the SME board in Shenzhen Stock Exchanges. However, some of the control variables are calculated as 3-year average. Thus, all companies that went to public after 31st December, 2009 are excluded from the sample. I got 327 companies in the initial sample. Consistent with previous study on corporate diversification (see e.g., Lins and Servaes, 1999) financial firms and those whose main lines of business is regulated utility industry are excluded. Then firms with stock marked ‘ST’ are deleted as well.⁶ Then SIC-based product sales and corresponding code was collected and examined. Firms with abnormal product segment and total sales, and/or unclassified business segment are also eliminated from the sample. Finally, if information regarding the ultimate controller, for example, missing identity and/or lacking of ownership information, the corresponding firm will be excluded as well. After all selection process was executed and my final sample includes 144 companies (see concrete selection process in Table 4).

Table 4: Selection process of the sample firms

Initial No. of sample firms			327
Process	Excluding Criteria	No. of Firm eliminated	No. of Firm remained
1	Financial firms	1	326
2	Firms in regulated industry	2	324
3	ST stock	8	316
4	4.1 Segment sales missing	8	308
	4.2 Segment sales negative	4	304
	4.3 Segment SIC code missing	17	287
	4.4 Segment sales unequal to direct sales	36	251
	Segment info unreliable	65	251
5	5.1 Capital expenses data missing	2	249
	5.2 Total asset figure missing	5	244
	5.3 Without enough data for leverage	98	146
	Control variable data incomplete	105	146
6	Controller identity missing	2	144
Final No. of firms of the sample			144

⁶ ST is short for ‘Special Treatment’. On April 22, 1988, Shanghai and Shenzhen Stock Exchanges announced that, according to the stock listing rules, stocks of listed firms with abnormal financial conditions would be given special treatment. Abnormal financial condition could be one of the following conditions: 1) net profit of listed firms were negative in two consecutive fiscal year; 2) net asset per share in one recent fiscal year is lower than the face value of the share; 3) no persuasive auditing report was provided from the most recent fiscal year; and/ or 4) any abnormal financial behavior identified and claimed by CSRC. Source:

6.2. Definition of variables

In this section, I define the variables used in this article. Diversification is treated as the dependent variable, managerial ownership, identity and shareholdings of ultimate controller as well as separation between voting rights and cash-flow rights being of independent variable. Control variables are firm-level control variables, including firm size, leverage, listing years, capital intensity and prior performance and industry variables.

6.2.1. Dependent variable---Diversification level

Two approaches were gradually developed to capture a corporation's diversification strategy: categorical measure refined by Rumelt and continuous SIC-based product count measures, such as Herfindahl index approach and entropy index approach. With former usually adopted by strategic management schools to illustrate the benefits of diversification, academics from economic school do empirical studies with continuous measures (Hitt et al., 1997; Ramaswamy et al., 2002; Hautz et al. 2011). Hoskisson et al. (1993) treat entropy index as the most valid and reliable measure to measure product diversification. What's more, Ramaswamy et al. (2002) find that Herfindahl index and entropy index are highly correlated.

6.2.1.1. Entropy Index

Entropy index for each company is calculated by using 2-digit business segment sales figures in 2011 obtained from Worldscope database. Entropy index proxy corporate diversification of the firm on the number of segments and relative weights of each segment with respect to total firm-level. Calculation method is shown below:

where $Diver$ is the measure of firm's unrelated corporate diversification; p_i is the proportion of the sales in the i th segment and N is the number of 2-digit SIC segments where the firm operates. A higher $Diver$ value of indicates higher level of unrelated corporate diversification. If the company only operates in one business segments, then $Diver$ is zero.

6.2.1.2. Business segment number

It's a consensus that China's capital market was less developed and lack of protection for minority investors. Accounting frauds, such as providing false and ambiguous classified

accounting figures, are covered on the media quite often. During collection and selections process of the firm-level data, I also noticed that part of the accounting figures is questionable, for example, missing and/or negative segment sales figure, missing segment SIC code or unclassified business segment. Claessens et al. (2004) used number of segment defined as the two-digit SIC level to proxy diversification level because they believed it can reasonably capture the breadth of the firm's activities. So, the business segment number was also used to approximate the level of corporate diversification in my study as well. I just count the number of business units directly if the company received money from that specific unit.

6.2.2. Independent variable---ownership variables

I study the relation between ownership structure and level of unrelated diversification from the two perspective of ownership structure: identity of the ultimate controller and cash-flow right, voting right and separation between voting rights and control rights. Managerial ownership is also introduced to test the agency problems between managers and stockholders of listed firm on SME board.

6.2.2.1. Managerial ownership

Managers take care of the daily running of company and they might have significant impact on firms' strategy toward diversification. However, according to agency theory, company officer has incentive to diversify company's business into other industries. Following Denis, et al. (1997), I test to what extent managers can affect firm diversification. Managerial ownership is measured with the proportion of equity held by the top managers and directors of the board. The required data are collected from Wind database.

6.2.2.2. Owner identity

According to Thomsen and Pederson (2000), largest owner identity is a good proxy of ownership structure of firm. But considering that there are overlaps among the largest owner identity among Chinese public companies, I employ the ultimate owner identity. In order to find out the identity of sample companies' ultimate controller, I went back to the annual reports of each listed firm. Ultimate controller identity and shares of holding information can be easily found from each company's annual reports. Annual report also addresses the fact that if no one holds more than 10% of the stock of certain company, then it is defined as

widely-held. Among those firms with ultimate controller, identities are either family (including individuals) or state. In situations where controller has more than 10% shareholdings, if the ultimate owner is family then it is defined as family-controlled. Similarly, if the ultimate owner is state, local government or SOE, then it is regarded as state-controlled. In some firms, several block holders may have signed up a contract to become ‘Persons Acting in Concert (PACs)’⁷ to acquire or consolidate the control over a firm. Such firms are defined as family-owned as well. The ultimate owner identity is a binary dummy variable which receives one if ultimate controller owns at least 10% of the control right and is a family, zero if being the state.

6.2.2.3. Cash-flow right, control right and their separation

According to Hautz et al. (2011), percentage of outstanding shares held by each type of owners is widely used in literature to capture the ownership concentration. However, previous studies also show that deviation of voting rights from cash-flow right also plays an important role in firm strategy formulation process, so I also employ this measure to capture the ownership when such separation exists.

As a way to relieve their demand for funds, many of listed SMEs on the SME board has chosen pyramidal structure. A pyramid structure is the way a shareholder holds a controlling stake in a holding company, and the holding company possesses a controlling stake in the listed company. In my sample, ultimate controller of 72 firms (50%) has realized the controlling of public firm via pyramid holding. This kind ownership guarantees control of the firm with little initial investment. In addition, it enables ultimate owners to take advantage of their control to make the best use of affiliated firm’s earnings.

Calculations of ultimate controllers’ shares of control are less straightforward. Since many ultimate controllers may realize their control of the listed firms through different control chains, the purely ownership, which can be expressed as the cash-flow rights in the questioned company, cannot completely reveal the fact that they have more power on affecting the controlled firm’s diversification strategy. Thus, the voting rights were in used in this study.

⁷ PACs are individual(s)/company(ies)/ any other legal entity(ies) who are acting together for a common objective or for a purpose of substantial acquisition of shares or voting rights or gaining control over the target company pursuant to an agreement or understanding whether formal or informal. Acting in concert would imply co-operation, co-ordination for acquisition of voting rights or control, either direct or indirect. (Source: Securities and Exchange Board of India)

To calculate the voting rights of the ultimate controller, I followed Faccio and Lang (2002)'s method. Next I will illustrate the method by taking two companies for examples, one controlled by family and the other by state.

Figure 2 show that Yao Xinyi, as the ultimate controller, controls Anhui Jiangnan Chemical Industry Co., LTD (002226) through three intermediate companies---Dun'an Holding Group, Anhui Dun'An Chemical Industry Group, and Hefei Yongtian Mechanical and Electrical Equipment. Firstly, Yao indirectly control 33.23% stake in Jiangnan Chemical Industry via directly own 51% of Dun'an Holding Group. Secondly, Yao , through direct owning 12% share and indirect holdings of in Anhui Dun'An Chemical Industry Group, holds another 13.71% in Jiangnan Chemical Industry. Moreover, via Hefei Yongtian Mechanical and Electrical Equipment, which is half-owned by Dun'an Holding Group, Yao holds 6.79% in Jiangnan Chemical Industry. Summing up the weakest link of these three chains, voting rights of Wang is:.Multiply Yao's voting rights in each intermediate companies and then sum up, thus the cash-flow right is:. Yao controls Anhui Jiangnan Chemical Industryvia pyramid and it causes a difference of 28.72% between voting rights and cash-flow rights.

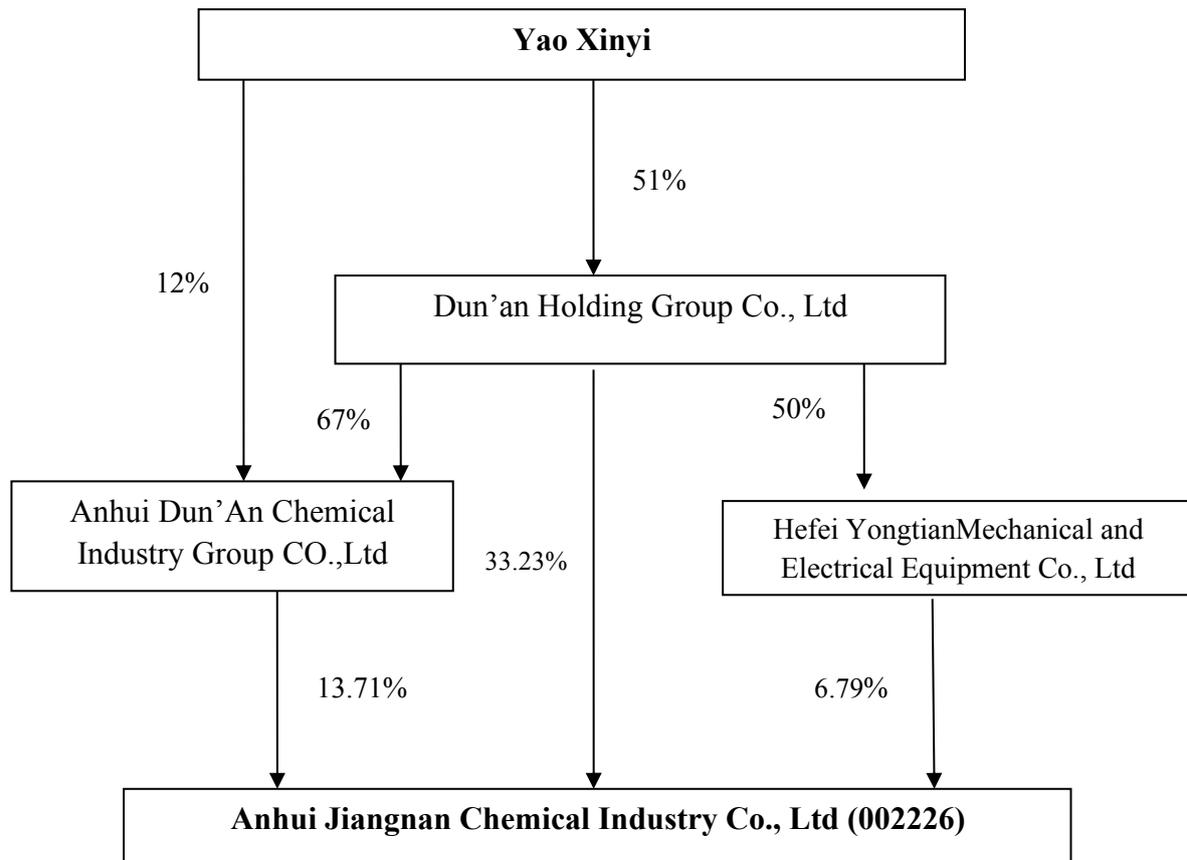
Figure 2: Controlling structure of Anhui Jiangnan Chemical Industry Co., Ltd (002226)

Figure 3 manifests how state realizes control of a listed firm through pyramid. In this example, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC)⁸ is the ultimate controller of Xinjiang Guotong Pipeline Co, LTD (002205). SASAC owns 100% of China National Materials Group Corporation Ltd, which has a stake of 50.95% in Xinjiang Tianshan Building Material (Group) Co., Ltd. Xinjiang Tianshan Building Material (Group) Co., Ltd, holds 30.21% shares of Xinjiang Guotong Pipeline Co, LTD. So the as the ultimate controller of Xinjiang Guotong Pipeline, SASAC has voting rights of 30.21%, and its cash-flow right is: .There is a discrepancy of 14.81% between the two measures.

⁸ Authorized by the State Council, in accordance with the Company Law of the People's Republic of China and other administrative regulations, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) performs investor's responsibilities, supervises and manages the state-owned assets of the enterprises under the supervision of the Central Government (excluding financial enterprises), and enhances the management of the state-owned assets. Source: State-owned Assets Supervision and Administration Commission of the State Council.

Figure 3: Controlling structure of Xinjiang Guotong Pipeline Co., Ltd (002205)

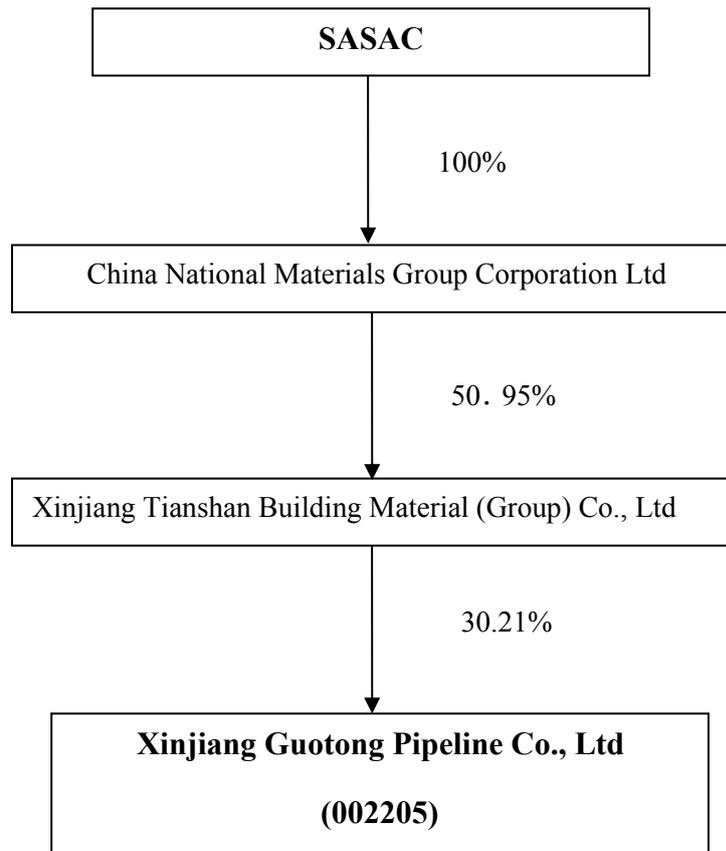
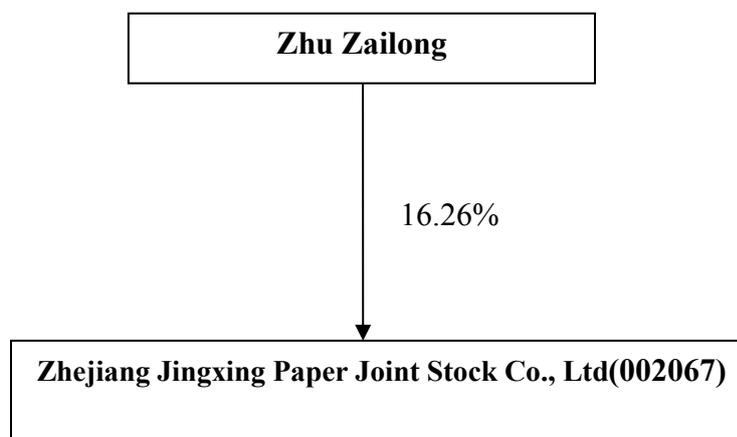


Figure 4 show how an individual can control a publicly traded firm directly. As the founder and also chairman of the board, Zhu Zailong is the ultimate owner of Zhejiang Jingxing Paper Joint Stock Co, LTD (002067). He holds 16.26% of the total shares of the company and 16.26% of the cash-flow rights as well.

Figure 4: Controlling structure of Zhejiang Jingxing Paper Joint Stock Co., Ltd (002067)



Similar to Claessens et al. (1999a), I measured separation between voting right and control right with the ratio of voting right to cash-flow right. In general, a shareholder's voting right should be equal to his or her cash-flow right, which represents the claim for the residual value. However, in company with pyramid structures or dual-class shares, ultimate owner can control much more voting right than their initial cash investment.

6.2.3. Firm-level control variables

In order to focus on the relation between corporate diversification and ownership structures, I introduced several firm-level control variables that were often used in previous study of corporate diversification.

Firm size is relevant in company's diversification process. Campa and Kedia (2002) show that size of diversified firms are significantly different from those only operates in single business segments. Grant et al. (1988) argue that diversified companies can benefit from scale and scope economies, have more market power and access to more resources. Both Hill and Snell (1988) and Denis et al. (1997) find that firm size is positively related to diversification level. Assets which show the average firm size of each type of firms are measured as the natural logarithm of total assets as of 2011.

Leverage presents the capital structure, which can affects firm diversification strategy by some studies. Lewellen (1971) contend diversification can reduce volatility of earning, thus improving company's debt capacity. Following Ramaswamy et al. (2002), 3-year (2009-2011) average of firm-level debt-to-equity ratio is calculated to control for leverage's effect on corporate diversification.

Capital intensity is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Capital intensity reflects a firm production capabilities and firm-specific knowledge (Denis et al. 1997). This would affect its willingness to investment in R&D, which is positively related to growth opportunities. Generally, firms with less growth opportunity might tend to pursue new drivers of income via diversification.

Finally, prior performance many lead firms to diversify, because firms with weak profitability tend to seek new profits resource via diversifying into different market areas (Campa and Kedia, 2002). ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets.

Industry variable is a binary dummy variable. China is well-known for its manufacturing industry, and among the sample companies, more than have its core business lie in one of the subsection of manufacturing industry. So when the 2-digit SIC code of company's largest business segments by sales is between 20 and 39, it is defined as a manufacturing company. It's different from many of previous studies on the diversification of the diversification of Chinese public firms, which is more arbitrage, because the classification is basing on the researcher's objective judgment. This method is more consistent with traditional way to study of the western diversification issues.

Table 5: Summary of Variables

Variables	Measures	Definition
Dependent Variable		
Diver ₁	Level of corporate diversification	Entropy approach:
Diver ₂	Level of corporate diversification	Business count measure: a rough proxy for level of unrelated diversification
Independent Variable		
Managerial ownership (MO)	Proxy for ownership structure	Proportion of outstanding shares held by managers and other board members
Identity of ultimate controller	Proxy for ownership structure	Dummy variable which receive 1 if the ultimate controller belong to the specific category; otherwise 0
Control rights (V)	Proxy for ownership structure	Ultimate controller's voting rights from holding shares of the questioned company: directly and/or indirectly
Cash flow right (CL)	Proxy for ownership structure	Ultimate controller's cash flow right from owning the shares of the questioned company: directly and/or indirectly
Separation index	Proxy for ownership structure	Control rights divided by cash flow right
Firm-level control variable		
Ln (Asset)	Firm size	Natural logarithm of average of total asset at beginning and ending of fiscal year in 2011
Leverage (Lev.)	Firm capital structure	3-year (2009-2011) average of firm's Debt/Equity ratio
Capex.	Capital intensity: reflect the difference in production capability, knowledge and ability to generate sales from investment	3-year (2009-2011) average of firm's Capital expenditures to Sales ratio
ROA	Profitability	3-year (2009-2011) average of firm's Return on Asset ratio
Industry	Industry effects on corporate diversification	Dummy variable which receive 1 if the core business are classified into manufacturing; otherwise 0

7. Methodology

Multiple regression analysis was executed with the pooled firm-level data for sample companies. In the first two models, I explore the relation between managerial ownership and level of corporate diversification for all sample companies. Following Denis et al. (1997), I also test if a nonlinear relation exists between diversification and managerial ownership. I do so by including the square of managerial ownership as an additional independent variable in model 2.

(1)

(2)

where $Diver_n$ is the measure of corporate diversification, which proxy diversification with segment-sale based entropy measure when $n=1$; and when $n=2$, it is number of business segments which indicate the operation scope of the company. MO is the shareholdings owned by managers and board members, MO^2 is the square of managerial ownership. X_c is a vector for firm-level control variables.

The third regression explores the link between owner identity and the level of corporate diversification. Firms without ultimate controller at the 10% threshold are widely-held companies. Since this model is to test impact of owner identities on diversification, widely held firm will be exempted from the sample.

(3)

where $Diver_n$ is the measure of corporate diversification, which proxy diversification with segment-sale based entropy measure when $n=1$; and when $n=2$, it is number of business segments which indicate the operation scope of the company. D_i is a dummy variable which receive a value of one if the ultimate controller owns at least 10% of the voting rights and is a family, and zero otherwise. X_c is a vector for firm-level control variables.

The fourth regression explores the impact of controller's cash-flow right on level of corporate diversification. The fifth regression explores the impact of controller's cash-flow right and separation between control right and cash-flow right on level of corporate diversification with those firms ultimate controller held more voting rights than their cash-flow rights.

(4)

(5)

The last regression explores the link between diversification level and ultimate controller information as a whole, including the identity, voting rights, cash-flow rights and separation between the former two items.

(6)

where $Diver_n$ is the measure of corporate diversification, which proxy diversification with segment-sale based entropy measure when $n=1$; and when $n=2$, it is number of business segments which indicate the operation scope of the company. CL denotes the cash-flow rights, Separation stand for the ration of voting rights divided by cash-flow rights. X_c is a vector for firm-level control variables.

8. Empirical results and discussion

8.1. Descriptive results

8.1.1. Diversification level

Table 6 reports descriptive statistics of for all variables of sample firms. The sample consists of 144 firms from the SME board of Shenzhen Stock Exchange. Combined with the more detailed diversification information in table 7, it's easy to find that diversification is very common among public firms on the SME board. In the sample, only 4 out of the 144 companies operate in clearly defined single business line, the rest 97% compete in multiple industries. Average business unit number of the selected firms is 2.72 and range from one to six. The segment-based entropy measure averages at 0.3196.

Table 6: Statistical summary on the other variables for all firms

This table presents the statistics of variables for: sample companies, state owned company and family/individual owned companies. The sales-based Entropy index $Diver_1$ is the dependent variable calculated as the year-end figure at 2011 is used to proxy corporate diversification. $Diver_2$ is the business units the firm competes in. M.O. is the proportion of equity held by managers and board members. Ins. O. indicate how much of the total shares are possessed by institutional investors. Ultimate controller's voting right and cash-flow right are calculated according to Faccio and Lang (2002)'s method. Separation is proxy for deviation of voting right from cash-flow right. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	All firms				Family-owned				State-owned			
	Mean	Median	Min.	Max.	Mean	Median	Min.	Max.	Mean	Median	Min.	Max.
Firm No.	144 (100%)				112 (77.78%)				32 (22.22%)			
Diver₁	0.3196	0.2390	0.0000	1.4850	0.3288	0.2641	0.0000	1.4850	0.3045	0.2131	0.0000	1.1284
Diver₂	2.72	2.00	1.00	6.00	2.71	2.00	1.00	6.00	2.75	3.00	1.00	4.00
M.O.	16.96%	9.35%	0.00%	67.85%	20.95%	14.07%	0.00%	67.85%	2.98%	0.07%	0.00%	51.73%
Ins. O.	7.93%	4.71%	0.00%	26.99%	7.35%	4.27%	0.00%	44.79%	9.96%	7.64%	0.00%	32.70%
Voting rights	43.77%	44.32%	13.58%	89.41%	43.33%	42.16%	13.58%	89.41%	45.30%	46.80%	16.72%	73.80%
CL. Rights	37.65%	36.24%	2.93%	78.18%	36.49%	34.81%	2.93%	78.18%	41.68%	44.52%	15.39%	70.09%
Separation	1.33	1.00	1.00	8.71	1.38	1.01	1.00	8.71	1.16	1.00	1.00	1.96
Total Asset	5723.7	2107.0	306.1	259869.3	5863.3	2025.3	306.1	259869.3	5235.2	2267.5	706.2	34484.1
Ln (T.A.)	21.65	21.47	19.54	26.28	21.68	21.50	19.54	26.28	21.53	21.40	20.38	24.19
Leverage	21.68%	9.90%	0.01%	837.51%	23.82%	9.98%	0.01%	837.51%	14.20%	4.28%	0.02%	122.63%
Capital intensity	18.16%	12.58%	0.13%	157.59%	18.65%	12.88%	0.13%	157.59%	16.44%	12.48%	1.76%	70.45%
R.O.A.	5.44%	5.33%	-16.64%	26.96%	5.49%	5.33%	-11.10%	26.96%	5.26%	5.21%	-16.64%	22.78%

Table 7: Descriptive statistics of the diversification situation for total sample companies

Entropy index is segment sales-based index proxy corporate diversification.

Business unit No.	1	2	3	>=4
No.of sample firms	4	71	38	31
Percentage	2.78 %	49.31 %	26.39 %	21.53 %
	Maximum	Minimum	Average	Median
Business unit No.	6.00	1.00	2.72	2.00
Entropy index	1.4850	0.0000	0.3196	0.2390

8.1.2. Managerial ownership

Table 6 and table 8 contain the information of shareholdings by managers and board members in listed firms on the SME board. On average, management owns 16.96% in the firm under their command. But the holding variance is very big, ranging from 0 to the 67.85%. Although in 46 (around 32% of the whole sample) firms, managerial shareholding is less than 1%, in 72 firms, that is 50% of the total sample, the proportion of shares held by management is larger than 10%. This is very different from previous some previous studies.

Following Denis, et al. (1997), I calculated the mean level of diversification by ownership of all managers and director. As show in table 8, diversification level measure with segment sales-based entropy index seems has no apparent relation with the equity ownership of management. When diversification is measure with business unit number, no obvious trend can be captured between diversification level and managerial ownership. However, when managers hold more than 15% of the stock in the company, diversification decreases monotonically. The number of segments declines from 3.33 to 2.37.

Table 8: Descriptive Statistics of shareholdings of management and diversification index

The sales-based Entropy index $Diver_1$ is the dependent variable calculated as the year-end figure at 2011 is used to proxy corporate diversification. $Diver_2$ is the business units the firm competes in. MO is short for managerial ownership.

Ownership of Mgt.	No. of firms	Percentage	Ave. shares	Diver₁	Diver₂
MO\leq1%	46	31.9%	0.12%	0.3277	2.83
1%<MO\leq5%	18	12.5%	2.66%	0.3335	2.83
5%<MO\leq10%	8	5.6%	6.96%	0.1007	2.38
10%<MO\leq15%	17	11.8%	12.71%	0.4382	3.18
15%<MO\leq20%	6	4.2%	17.40%	0.4229	3.33
20%<MO\leq25%	8	5.6%	22.18%	1.0068	2.63
MO>25%	41	28.5%	45.31%	0.2594	2.37
Total sample	144	100.0%	16.96%	0.3196	2.72

8.1.3. *Ultimate owner identity, ownership and diversification*

Table 6 and table 9 present the owner identity and deviation between voting rights and cash-flow right of the total sample firms. At the 10% threshold level, all firms have ultimate controller, which means, in generally, ultimate owner has large block holdings in my sample. On average, their stockholdings are 43.77% of the total equity, which ranges from 13.58% to almost 90%. This is consistent with many previous studies on the Chinese listed company, that is, Chinese public firms have very concentrated ownership structure. Regarding to the owner identity, family controls around 80% of the firms, with state controlling the rest 20%. These finding is contradict with claims that the government dominates the Chinese capital market. For instance, Liu and Sun (2005) study the identity of Chinese public firms' ultimate controller, reporting 81.6% of their sample firms are controlled by the government. Fan and Wong (2004) also document 76% of their sample firms are ultimately owned by state. This result shows different characters exist within China's capital market.

Table 9: Owner identity and separation between voting rights and control rights of all sample firms

V and CL are short for voting right and cash-flow right of ultimate controllers.

Owner identity	Firm number	V \geq CL	Firm number	Percentage
Widely-held	0	-	-	-
Family	112	yes	62	55.36 %
	(77.78%)	no	50	44.64 %
State	32	yes	10	31.25 %
	(22.22%)	no	22	68.75 %

The mean and median value of control right differ by owner identity: for family as ultimate controller, the two figures are 43.33% and 42.16%, respectively; for state as ultimate controller, the two measures are 45.30% and 46.80%. So, in my sample, state as the ultimate controller hold more shares than families do.

Cash-flows right taken by ultimate controllers is a little bit different. Even though the average cash-flow right is 17.65%, and ranges from less than 3% to 78.18%. What's more, it also manifest that separation between voting rights and cash-flow rights is rather common. 55% of family-owned and one third of the state owned realizing control of the public firms with less cash-flow rights. In the extreme situation in Ningbo YAK Technology Industrial Co., Ltd (002036), ultimate controller Li Chenru's voting rights are eight times of his cash-flow rights.

Table 6 also documents the statistical summary of all other variables. Shareholdings possessed by institutional investors are relatively small, with average 7.93% and median 4.71%. Although the maximum holding in GRGBanking (002152) is 29.68%, it's still smaller than the proportion of equity held by ultimate controller---the state owns 47.83% of its total shares. Size of the sample firms vary significantly, from the smallest with total asset of 306.06 million RMB to largest of 259.869 billion RMB as the end of 2011. There are great variances among the sample firms in the perspective of debt level, investment in R&D, as well as the profitability.

Table 6 documents the diversification level of family-owned and state-controlled firms as well. When measured with entropy index, families as the ultimate controller tend to diversify their companies more than state do, because both the mean and median value of this measure for family firms are bigger than those of the state corporations. However, the average and median business unit numbers of family controlled-firms are smaller than that of SOE's,

showing state controlled firms are more diversified. Two measures of diversification level lead to different direction of relation between owner identity and diversification. The second measure seems to support my hypothesis that family controlled firms are less diversified than state owned companies.

8.2. Regression Results and discussion

In this part I present and analyze the results from OLS regression, between diversification level, measured with $Diver_1$ and $Diver_2$, and independent variables, including managerial ownership, ultimate controller identity, cash-flow rights held by ultimate owner, separation between voting rights and control rights of ultimate controller. I controlled the firm-level variables, including firm size, leverage, capital intensity and previous profitability. Industry membership is also controlled in later analysis.

8.2.1. Managerial ownership and diversification

Model 1 investigates the association between managerial shareholdings and corporate diversification. Denis et al. (1997) also tested if nonlinearities exist between managerial ownership and diversification based on the nonlinear relation between Tobin's q and managerial ownership documented in McConnell and Servaes (1990). I followed their method to redo the regression between manager's shares and level of diversification in model 2 by introducing the square of management shareholdings. Table 10 present the regression result between diversification level and managerial ownership.

In model 1, both the two measures are negatively related to managerial ownership. But for the segment sales-based entropy index, the relation is not statistically significant ($t = -1.44$ without controlling industry membership, and $t = -1.36$ when controlled). The negative relation between number of business segments and managerial ownership is statistically significant at 1% level. This supports my first hypothesis and provides evidence that as managerial ownership increase, managers' incentives become more aligned with those of shareholders, and thus leading to lower level of diversification. This is consistent with the findings in Denis, et al. (1997).

In model 2, the square of managerial ownership is introduced as an independent variable. Similar to model 1, negative relations are found between entropy index and square of managerial ownership, and between business segment number and diversification level, but

neither is statistically significant. In addition, after introducing the new measure, the original significant negative relation between diversification level measured with business segment number and management shareholding is apparently affected. Negative relation is observed when industry is not controlled, and positive relation exists when control the industry between business unit number and managerial ownership. Therefore, I contend that, for the public companies on the SME board, the relation between diversification level and managerial ownership is linearly negative only when business unit number is used to measure extent of corporate diversification.

Table 10: Regression for the relations between level of diversification and managerial ownership

This table presents the Excel regression results for relations between corporate diversification-Diver₁ and Diver₂, and managerial ownership, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 is used to proxy unrelated corporate diversification, and Diver₂ means number of segment the company operates in. In model 1, a linear relation is assumed between diversification level and managerial ownership. In model 2, square of managerial ownership is introduced to test if a nonlinear relation exists. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Model 1				Model 2			
	Diver ₁		Diver ₂		Diver ₁		Diver ₂	
Interception	-0.3303 (-0.58)	-0.4502 (-0.76)	1.8221 (1.04)	1.1107 (0.62)	-0.3127 (-0.54)	-0.4324 (-0.72)	2.0116 (1.15)	1.2924 (0.71)
MO	-0.1827 (-1.44)	-0.1732 (-1.36)	-1.1731*** (-3.03)	-1.1163*** (-2.87)	-0.0831 (-0.20)	-0.0592 (-0.14)	-0.0957 (-0.07)	0.0481 (0.04)
MO2	-	-	-	-	-0.1802 (-0.25)	-0.2058 (-0.28)	-1.9481 (-0.87)	-2.1022 (-0.94)
LN(A.T.)	0.0345 (1.32)	0.0377 (1.42)	0.0629 -0.79	0.0821 (1.02)	0.0334 (1.26)	0.0366 (1.36)	0.0516 (0.64)	0.0705 (0.86)
Capex.	0.0112 (-0.25)	0.0084 (0.18)	0.1397 (1.03)	0.1235 (0.91)	0.0093 (0.21)	0.0063 (-0.14)	0.1196 (0.87)	0.1013 (0.74)
Leverage	-0.2948* (-1.90)	-0.2815* (-1.80)	-1.3698*** (-2.89)	-1.2911*** (-2.72)	-0.2906* (-1.86)	-0.2765* (-1.75)	-1.3241*** (-2.78)	-1.2393*** (-2.59)
ROA	-0.2657 (-0.56)	-0.2411 (-0.50)	-0.8160 (-0.56)	-0.6699 (-0.46)	-0.2640 (-0.55)	-0.2387 (-1.50)	-0.7983 (-0.55)	-0.6462 (-0.44)
Control industry	no	yes	no	yes	no	yes	no	yes
R Square	0.0604	0.0640	0.1184	0.1310	0.0608	0.0645	0.1232	0.1366
N	144	144	144	144	144	144	144	144

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

8.2.2. *Ultimate owner identity and diversification level*

Regressing the diversification level by the owner identity is to testify whether owner's motivations have impacts on the corporate diversification strategy among the SME board listed firms. Table 11 present the regression result between ultimate controller identity and diversification level. Ultimate owner identity is a binary variable, which receives 1 when the ultimate owner is a family; and 0 otherwise. Diversification level measured with business unit number is negatively related to the owner identity, but the coefficient is not statistically significant. Segment sales-based entropy measure was not able to provide statistically significant evidence for the existence of link between controller identity and level of corporate diversification either.

Table 11: Regression for the relations between owner identity and corporate diversification for all sample firms (10% threshold)

This table presents the Excel regression results for relations between corporate diversification-Diver₁ and Diver₂, and identity of the ultimate controller identity at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011, and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. During screening of the data, I found owner identity can only fall into one of the followings: government and family/individual. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	0.1360 (0.24)	0.0538 (0.09)	3.2474* (1.81)	2.9869* (1.67)
Owner identity	0.0239 (0.39)	-0.0007 (-0.01)	-0.0109 (-0.06)	-0.0891 (-0.46)
LN(A.T.)	0.0108 (0.41)	0.0096 (0.37)	-0.0087 (-0.11)	-0.0124 (-0.15)
Capex.	-0.0167 (-0.37)	-0.0180 (-0.40)	0.0480 (0.34)	0.0441 (0.32)
Leverage	-0.1274 (-0.81)	-0.1303 (-0.84)	-0.9546* (-1.95)	-0.9639** (-1.99)
ROA	-0.7726 (-1.59)	-0.6715 (-1.39)	-3.0373** (-2.01)	-2.7170* (-1.81)
Control industry	no	yes	no	yes
R Square	0.0297	0.0555	0.0580	0.0840
N	144	144	144	144
* Significant at 10% level				
** Significant at 5% level				
*** Significant at 1% level				

8.2.3. Cash-flow rights, separation between voting rights and cash-flow rights and diversification

Regression diversification level on cash-flow right is to test if increasing equity stakes in public firm will help align the interest between ultimate controller's and minorities'. Table 12 provides the regression results between cash-flow right and corporate diversification level.

The coefficient of cash-flow right is negative and statistically significant at 1%. This show cash-flow right can help to align the interests between block holder and small investor, thus reducing agency cost by decreasing the value-reducing diversification level. A negative relation can also be found between cash-flow right and diversification measured with entropy index, however, the link is not statistically significant.

Table 12: Regression for the relations between ultimate controller's cash-flow rights and corporate diversification (10% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and cash-flow right of ultimate controller at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	0.2352 (0.40)	0.0791 (0.13)	4.2736** (2.46)	3.3284* (1.87)
Cash-flow right	-0.1515 (-1.00)	-0.1733 (-1.14)	-1.6331*** (-3.65)	-1.7648*** (-3.95)
LN(T.A.)	0.0094 (0.36)	0.0138 (0.51)	-0.0306 (-0.39)	-0.0042 (-0.05)
Capex.	-0.0146 (-0.32)	-0.0178 (-0.40)	0.0651 (0.49)	0.0452 (0.34)
Leverage	-0.1245 (-0.80)	-0.1064 (-0.68)	-0.9373** (-2.01)	-0.8275* (-1.78)
ROA	-0.6869 (-1.40)	-0.6399 (-1.30)	-2.1697 (-1.49)	-1.8850 (-1.30)
Control industry	no	yes	no	yes
R Square	0.0358	0.0431	0.1409	0.1677
N	144	144	144	144

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

Regression divergence between cash-flow right and control right is to see whether it can increase ultimate controller's incentive to expropriate minority interests. Table 13 presents the regression results between the two items. A significant positive relation is observed between separation and diversification level measure with business segment number, because, in the regression, the coefficient is positive and statistically significant at 1% level. This reveals that divergence between voting right and cash-flow right of ultimate owner can motivate block holder to take advantage of their control and gain private benefits at the expenses of minority shareholder. This is consistent with finding Claessens et al (1999b).

Table 13: Regression for the relations between Separation between voting right and cash-flow right and corporate diversification (10% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and separation between cash-flow right and voting right of ultimate controller at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Separation is the ratio of voting right to cash-flow right of ultimate controller's. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	0.0844 (0.15)	-0.0552 (-0.09)	2.6135 (1.47)	1.8896 (1.03)
Separation	0.0235 (0.72)	0.0230 (0.71)	0.2677*** (2.71)	0.2649*** (2.69)
LN(A.T.)	0.0125 (0.47)	0.0164 (0.61)	0.0033 (0.04)	0.0231 (0.28)
Capex.	-0.0160 (-0.36)	-0.0189 (-0.42)	0.0497 (0.37)	0.0345 (0.25)
Leverage	-0.1211 (-0.77)	-0.1064 (-0.67)	-0.8977* (-1.88)	-0.8213* (-1.72)
ROA	-0.7700 (-1.59)	-0.7406 (-1.53)	-3.0671** (-2.09)	-2.9143** (-1.99)
Control industry	no	yes	no	yes
R Square	0.0323	0.0374	0.1057	0.1195
N	144	144	144	144

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level

Table 14 present the results when diversification level is regressed on cash-flow right and separation between cash-flow right and control right. When entropy index was used to proxy diversification level, no significant relation is find between them. When the diversification is measure with business segment number, the coefficient of separation is still negative, but not

significant any more. However, the cash-flow right is significantly and negatively related to diversification level since its coefficient is still negative and significant. This can be interpreted as offsetting effect between cash-flow right and divergence between cash-flow right and voting right, showing Chinese ultimate controllers would less likely to take value-reducing diversification even they have the option to.

Table 14: Regression for the relations between cash-flow right, separation between cash-flow right and voting right and corporate diversification (10% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and cash-flow right of ultimate controller, and between corporate diversification and separation between cash-flow right and voting right of ultimate controller's at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Separation is the ratio of voting right to cash-flow right of ultimate controller's. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	0.1981 (0.33)	0.0589 (0.10)	3.8014** (2.13)	2.9838* (1.64)
Cash-flow rights	-0.1293 (-0.75)	-0.1593 (-0.91)	-1.3507*** (-2.64)	-1.5272*** (-2.97)
Separation	0.0098 (0.26)	0.0060 (0.16)	0.1247 (1.13)	0.1023 (0.93)
LN(A.T.)	0.0102 (0.38)	0.0142 (0.52)	-0.0212 (-0.25)	0.0023 (0.03)
Capex.	-0.0147 (-0.78)	-0.0179 (-0.40)	0.0630 (0.47)	0.0444 (0.34)
Leverage	-0.1226 (-1.42)	-0.1055 (-0.67)	-0.9136** (-1.96)	-0.8131* (-1.75)
ROA	-0.6998 (-1.57)	-0.6485 (-1.31)	-2.3329 (-1.60)	-2.0318 (-1.39)
Control industry	no	yes	no	yes
R Square	0.0362	0.0432	0.1488	0.1730
N	144	144	144	144

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level

8.3. Additional test

In this section, I increase the threshold to 20% to decide whether a public company is controlled by ultimate owner. Then, similar regressions were executed to test the relations between identity of ultimate controller's and diversification level, between cash-flow right of ultimate controller's and diversification level, and between the divergence of voting right and cash-flow right of ultimate controller's and diversification level.

Appendixes 1-5 provide the related descriptive statistics and regression result when the threshold of determining ultimate controller is increased to 20%. At the 20% threshold, 11 firms are widely-held. Both the two measure of diversification indicate widely-held firms are most diversified. I interpret this as, when monitoring from block holder is missing, managers tend to diversify more aggressively. However, the two measures have different views about the relative extent diversification between state- and family-owned companies. Average business segment number shows that state-controlled firms (2.78 business segment) are averagely more diversified than family-owned ones (2.66 business segments).

I duplicate the regression at 20% threshold between ultimate owner identity and diversification level, between cash-flow right and diversification level, between separation and diversification level. Still no relation is document between owner identity and diversification level. But the negative relationship between cash-flow right and diversification level, positive between separation between cash-flow right and voting right and diversification level all hold.

9. Limitations and Conclusion

9.1. Conclusion

I provide evidence on the agency cost explanation for the diversification of Chinese public firms on the SME board. Basing the regression results, I come to the following findings:

First, I find significant a negative relation exists between managerial ownership and diversification level. This indicates that as the shareholdings of management increase, interests between manager's and shareholder become more aligned, and thus managers are less likely to adopt value-reducing diversification. The finding is consistent with Denis et al.

(1997), which reach the similar conclusion when explained the excessive diversification of U.S. corporations in the 1980s.

Second, cash-flow right which proxy the equity stakes of ultimate controller are negatively between cash-flow right of ultimate controller's and diversification level for my sample firms. This provide the evidence on the align effects of interests between ultimate controller and minority shareholders.

Third, I document a positive relation between the divergence between the cash-flow right and voting right of ultimate controller's and diversification level. This is the evidence for the claim that such separation can reinforce block holder's incentive to expropriate minority interests (Claessens et al., 1999b).

For all the significant relations documented in my paper, corporate diversification level is measure with number of businesses segment. However, when the entropy index is used to proxy diversification level, such significant relations do not hold. Thus the entropy measure seems not a good proxy to measure the diversification level of public firms in the SME board when the data of segment sales is directly retrieved from the Worldscope database. In addition, I also find the family control much more firms than the state does in my sample, showing the variance existed within the Chinese capital market.

9.2. Limitations

Despite some significant relations were found in my analysis, there are still some limitations to my study. Firstly, the size of the sample is too small. There are only 144 companies in the sample, and the number becomes even smaller when I increase the threshold to 20% to define the ultimate controlling structure of sample firms. Secondly, the businesses segment number might not be a perfect measure for company diversification level, since some previous studies claim entropy method could better capture the extent of corporate diversification (see, e.g., Hoskisson et al., 1993). Thirdly, almost all of the sample firms have partial of the sale recorded in the financial statements unclassified. This might bring noises to the accuracy of diversification index when the entropy method is used. However, such limitation level future study opportunities to examine the diversification incentive with agency theory within the context of China, such as introducing more sample firms and adopt some better diversification index.

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Appendix**Appendix1 Descriptive statistics of diversification level by owner identity (at 20% threshold)**

V and CL are short for voting right and cash-flow right of ultimate controllers.

Owner identity	No of firms	Diver1		Diver2	
		Mean	Median	Mean	Median
Widely-held	11 (7.64%)	0.3745	0.2676	3.27	3.00
Family	102 (70.83%)	0.3172	0.2435	2.66	2.00
State	31 (21.53%)	0.3078	0.2183	2.78	3.00

Appendix 2 Regression for the relations between owner identity and corporate diversification (20% threshold)

This table presents the Excel regression results for relations between corporate diversification-Diver₁ and Diver₂, and identity of the ultimate controller identity at the 20% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011, and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. During screening of the data, I found owner identity can only fall into one of the followings: government and family/individual. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	-0.1746 (-0.26)	-0.3412 (-0.49)	4.1591** (2.00)	3.4482 (1.61)
Owner identity	0.0170 (0.27)	0.0209 (-0.33)	-0.0520 (-0.27)	-0.0357 (-0.19)
LN(A.T.)	0.0258 (0.82)	0.0302 (0.95)	-0.0510 (-0.53)	-0.0321 (-0.33)
Capex.	-0.0203 (-0.45)	-0.0231 (-0.51)	0.0621 (0.44)	0.0503 (0.36)
Leverage	-0.1395 (-0.87)	-0.1254 (-0.78)	-0.9755** (-1.99)	-0.9152* (-1.86)
ROA	-0.9125 (-1.73)	-0.8604 (-1.62)	-3.1931** (-1.97)	-2.9707* (-1.83)
Control industry	no	yes	no	yes
R Square	0.0387	0.0456	0.0687	0.0815
N	133	133	133	133

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

Appendix 3 Regression for the relations between cash-flow rights and corporate diversification (20% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and cash-flow right of ultimate controller at the 20% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	-0.0955 (-0.14)	-0.2725 (-0.39)	4.8804** (2.43)	3.9560* (1.94)
Cash-flow right	-0.1451 (-0.90)	-0.1736 (-1.07)	-1.5226*** (-3.20)	-1.6716*** (-3.51)
LN(A.T.)	0.0251 (0.80)	0.0302 (0.95)	-0.0608 (-0.66)	-0.0346 (-0.37)
Capex.	-0.0189 (-0.42)	-0.0218 (-0.48)	0.0690 (0.51)	0.0538 (0.40)
Leverage	-0.1372 (-0.86)	-0.1204 (-0.75)	-0.9544** (-2.02)	-0.8664* (-1.85)
ROA	-0.8248 (-1.55)	-0.7467 (-1.39)	-2.3673 (-1.50)	-1.9596 (-1.24)
Control industry	no	yes	no	yes
R Square	0.0443	0.0534	0.1378	0.1631
N	133	133	133	133

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

Appendix 4 Regression for the relations between Separation between voting right and cash-flow right and corporate diversification (20% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and separation between cash-flow right and voting right of ultimate controller at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Separation is the ratio of voting right to cash-flow right of ultimate controller's. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	-0.2290 (-0.34)	-0.3849 (-0.55)	3.4106* (1.70)	2.7488 (1.33)
Separation	0.0264 (0.81)	0.0257 (0.79)	0.3060*** (3.17)	0.3028*** (3.15)
LN(A.T.)	0.0272 (0.87)	0.0315 (0.99)	-0.0377 (-0.41)	-0.0197 (-0.21)
Capex.	-0.0194 (-0.43)	-0.0220 (-0.48)	0.0640 (0.48)	0.0532 (0.40)
Leverage	-0.1342 (-0.84)	-0.1208 (-0.75)	-0.9165* (-1.94)	-0.8596* (-1.81)
ROA	-0.9091 (-1.73)	-0.8576 (-1.62)	-3.2553** (-2.09)	-3.0369* (-1.94)
Control industry	no	yes	no	yes
R Square	0.0431	0.0494	0.1365	0.1482
N	133	133	133	133

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level

Appendix 5 Regression for the relations between ownership structure and corporate diversification (20% threshold)

This table presents the Excel regression results for relations between corporate diversification- Diver₁ and Diver₂, and cash-flow right of ultimate controller, and between corporate diversification and separation between cash-flow right and voting right of ultimate controller's at the 10% threshold, with firm-level variables controlled. The sales-based Entropy index Diver₁ is the dependent variable calculated as the year-end figure at 2011 and it is used to proxy corporate diversification. Diver₂ is the business segments in which the company operates in. Separation is the ratio of voting right to cash-flow right of ultimate controller's. Cash-flow right is the equity stake possessed by ultimate controller. ROA is a proxy for prior performance and is a 3-year (2009-2011) average of return on assets. Capex proxies for capital intensity and is a 3-year (2009-2011) average of capital expenditure-to-sales ratio. Leverage presents the capital structure and is a 3-year (2009-2011) average of firm-level debt-to-equity ratio. Assets show the average firm size, measured as the natural logarithm of assets as of 2011 (in Million RMB).

Variables	Diver ₁		Diver ₂	
Interception	-0.1495 (-0.21)	-0.3002 (-0.42)	4.1596** (2.03)	3.4332* (1.66)
Cash-flow rights	-0.1053 (-0.55)	-0.1487 (-0.75)	-0.9923* (-1.75)	-1.2011** (-2.09)
Separation	0.0146 (0.37)	0.0089 (0.22)	0.1948* (1.69)	0.1672 (1.45)
LN(A.T.)	0.0260 (0.83)	0.0306 (0.96)	-0.0488 (-0.53)	-0.0270 (-0.29)
Capex.	-0.0190 (-0.42)	-0.0218 (-0.48)	0.0683 (0.51)	0.0548 (0.41)
Leverage	-0.1350 (-0.84)	-0.1195 (-0.74)	-0.9240** (-1.97)	-0.8494* (-1.82)
ROA	-0.8489 (-1.57)	-0.7636 (-1.40)	-2.6884* (-1.70)	-2.2773 (-1.44)
Control industry	no	yes	no	yes
R Square	0.0454	0.0537	0.1571	0.1770
N	133	133	133	133

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level