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Does ownership structure affect performance? Evidence from Chinese mutual funds.

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Abstract

This paper examines the impact of ownership structure on Chinese mutual fund performance and market share. We focus on two dimensions of ownership structure, namely the background of the owners and the degree of ownership concentration. Using a hand-collected dataset comprising 731 observations for 94 fund management companies over the period from 2005 to 2015, we provide evidence with panel estimation shows that the government ownership ratio and government-controlled companies have a positive effect on funds' performance. On the other hand, foreign ownership has a negative impact on performance and market share. Having a higher ownership concentration is more likely to increase the company's market share, whereas government-controlled companies experience a negative impact on their market share.

Keywords: Chinese Mutual Fund Performance, Ownership Structure, Market Share, GMM.

JEL Classification: G23 G32

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1 Introduction

Over the past three decades, China's capital market has experienced rapid growth and has become the second largest in the world, moving from a predominantly centrally planned economy towards a market-oriented economy. In order to promote the stock exchange, and market related activism and oversight, the Chinese authorities has fostered the presence of institutional investors (Jiang and Kim 2015), especially in the case of mutual funds. The number of mutual funds has increased significantly since the first mutual fund was founded in China, in September 2001. The total net value of mutual funds increased from 470 to 1797 billion Chinese yuan from 2005 to 2007 (Yuan et al. 2008). Up to 2015, the total net value had soared to 8.4 trillions Chinese yuan (based on our data). This paper comes in a timely manner as it draws information from hand-collected data on Chinese mutual funds to explore the underlying relationships between funds' performance and ownership structure. There are some studies that review China's legal and financial system, especially with regard to corporate governance, investor protection and financial stability in general (Allen et al. 2008), though to date there is no evidence for mutual funds despite their prominent importance, if anything, due to their significant growth in recent years but also due to changes in the regulatory environment and the structure of this financial industry. Our paper covers this gap.

Moreover, some regulation reforms have been implemented through the years. The China Securities Regulatory Commission (CSRC)[3] made a strategic decision to permit the rules of establishment of joint venture fund management companies in 2002 in order to improve corporate governance and financial transparency in the mutual fund industry. These changes have allowed foreign institutions to invest in fund management companies which are controlled by government agencies. In light of this, the number of fund management companies with foreign investor has increased significantly to 46 at the end of 2015, accounting for almost half of fund management companies in the

[3] The China Securities Regulatory Commission (CSRC) is the main regulator of the securities industry in China and its operations are similar in its charge to the SEC in the United State.

market. Such changes lead to changes in the ownership structure as government ownership is being transferred to foreign investors. This raises an interesting question on whether different types of ownership would affect fund's performance, as having different types of owners could lead to different investment behaviors.

To date, the literature on corporate governance is largely focused on banks (Becker-Blease and Irani 2008; Brown and Caylor 2009; Boateng et al. 2017) whilst there are some studies on funds' performance (Gong et al. 2016; Ferris and Yan 2009). For China Gong et al. (2016) is one of the very few studies that examine the impact of organizational structure on funds' performance. Our study builds and extends on Gong et al. (2016) by investigating the impact of ownership structure on funds' performance and market share. We argue that funds' market share represents the culmination of all the decisions made by the fund management company and the investors' response to those decisions, in line with the seminal paper of Khorana and Servaes (2012).

To analyze the impact of ownership type on company performance and market share, we follow previous studies (Iannotta et al. 2007; Boubakri et al. 2013; Chen et al. 2017) and focus on two dimensions of a mutual fund management company's ownership. Firstly, we look at the background of the owners, which in this case is either the government or foreign investors. This distinction in ownership structure is of importance and has been rarely being studied though it would provide significant information regarding heterogeneity across fund management companies. For example, the background of the owners, two companies with the same degree of ownership concentration may differ in performance if one of them has a high government ownership. Secondly, we examine the degree of ownership concentration, as companies may differ because their ownership is more or less dispersed (Iannotta et al. 2007). In line with recent fund performance studies (Kong and Tang 2008; Cremers et al. 2009; Gong et al. 2016), we use the funds' raw return and abnormal return to represent its performance. In addition, we follow the study by Khorana and Servaes (2012) and include in our analysis the market share.

This paper contributes to the literature in several ways. First, the literature on ownership structure regarding to mutual fund management companies in developing countries, and in particular China, is limited and some related studies have largely focused on the

banking sector and non-financial firms. We argue herein that mutual fund management companies differ in many respects from banks and thereby one should provide modelling for the former. Such modeling should take into account regulations, the multitude of stakeholders and the complex management structure. Also, it is extremely difficult to collect information and thereby data for Chinese fund management companies, other than hand-collected data as it does the present study. Thus, we manually assemble a unique dataset of Chinese fund management companies that identify ownership structure in the form of government ownership, foreign ownership and ownership concentration from 2005 and 2015. This data set provides unique information for studying the effect of ownership structure on funds' performance, as none of its mutual fund management companies are publicly traded companies. Third, we consider whether the impact of foreign ownership on funds' return and market share is changed by the extent of government control, as Chen et al (2017) present that the impact of foreign ownership is influenced by the extent of government control. Therefore, we employ the interactions between foreign ownership and government ownership[4]. Lastly, we extend the literature by using different fund management company-specific variables[5] and employ the two-step 'system' dynamic generalized method of moments (GMM) estimations to address the issue of endogeneity which has been frequently quoted as an issue in similar studies.

Our findings show that government ownership asserts a positive effect on a mutual funds' performance. Alas, foreign ownership is not only linked to lower funds' performance, but also tends to reduce a fund management company's market share. Government-controlled fund management companies are negatively associated with their market share, whereas performance and market share are positively correlated with government ownership in highly concentrated in terms of ownership.

The rest of the paper is organized as follows: Section 2 reviews studies on the corporate governance of mutual fund management companies and also discusses the development of the hypotheses. Section 3 explains the methodology and data used. Section 4 presents

[4] We also consider the interactions between ownership concentration and foreign ownership and the interactions between ownership concentration and government ownership.
[5] Following recent studies, we summarize the attributes of mutual funds and fund management companies for comparison purposes in Appendix Table A3.

the results of the empirical study and offers some discussion. The final section summarizes key findings and suggests policy implications.

2 Related literature and hypothesis development

2.1 Ownership types and fund performance

Over the past decade, the corporate governance of mutual fund has achieved prominence both in relation to the developed and emerging markets (see, e.g. Tufano and Sevick 1997; Del et al. 2003; Kong and Tang 2008; Adams et al. 2010; Ding et al. 2010; Fu and Wedge 2011; Calluzzo and Dong 2014; Adams et al. 2018; Kurniawan et al. 2016). However, only few studies examine the relationship between ownership structure and mutual funds' performance where the focus is on the developed markets. Table 1 shows several recent empirical studies that investigate the impact of ownership structure on funds' performance (Berkowitz and Qiu 2003; Shinozawa 2007; Ferris and Yan 2009; Shinozawa 2010; Gong et al. 2016).[6] Berkowitz and Qiu (2003) examine the impact of the type of ownership of mutual fund on their performance and risk-taking behavior, and document that publicly-traded management companies do not perform better than private management companies. Gong et al. (2016) focus on the organizational structures of Chinese fund management companies and find that if the top1 shareholder has a larger stake in the company, this is positively correlated with an affiliated fund performance. However, having multiple large shareholders in a fund management company reduces fund performance.

Table 1 Recent studies on the relationship between ownership structure and fund performance

References	Countries	Years in sample	Ownership structure	Methodology
Gong et al. (2016)	China	2004 - 2009	Ownership concentration	FGLS regressions
Shinozawa (2010)	United Kingdom	1999 - 2001	Mutual vs Proprietary	Tobit regressions
Ferris and Yan (2009)	United States	1992 - 2004	Public vs Private fund families	Cross - sectional regressions
Shinozawa (2007)	United Kingdom	2000 - 2005	Mutual vs Public companies	Time series

[6] The terms 'fund management company' and 'fund family' are interchangeable.

Berkowitz and Qiu (2003)	Canadian	1985 - 1998	Public vs Private management companies	Cross - sectional regressions

2.2 Hypothesis development

2.2.1 Government ownership

Previous empirical studies note that government ownership plays an important role in influencing firm performance but present mixed results in the Chinese context. On the one hand, firms with high level of government ownership weakens the corporate governance mechanisms, because managers of these firms are not subject to market pressures such as those found in financial, goods, and labour markets (Chen et al. 2017). Chen et al. (2006) find that government ownership is positive associated with corporate fraud although only in relation to the univariate analysis. Fan et al. (2007) claim that state-controlled companies with politically connected CEOs have worse performance than companies without politically connected CEOs. In addition, they state that companies with politically connected CEOs prefer to appoint current or former government bureaucrats who often lack professionalism. In support of this argument, Ferri (2009) reports that city commercial banks perform better than state-controlled commercial banks with respect to non-performing loans. Similarly, Lin and Zhang (2009) observe there is a negative relationship between the ownership of the Big Four state-owned banks and long-term performance. Recently, Liang et al. (2013) found that a high level of political involvement in banks has a negative relationship with bank performance and asset quality using a sample of 50 largest Chinese banks from 2003 to 2010. Additionally, Fan et al. (2013) claim that companies with a higher degree of government ownership tend to perform relatively poorly in China, especially in the case of distressed companies.

On the other hand, to some extent, it is possible to observe the benefits of government-controlled companies as high level of government ownership results in effective monitoring on corporate governance and improved financial transparency, because governments have a monopoly on the use of coercive power. Sun et al. (2002) find that government ownership has a positive association with company's performance in China. They also point out that too little government ownership may not be good for firm performance. Moreover, Lin et al. (2016) indicate a positive relationship between government ownership of banks and cost efficiency in 12 Asian countries with more financial freedom.

Regarding studies in western countries, Berger et al. (2005) find the most robust results that state-owned banks are inefficient and perform poorly in the long-term using data from Argentina. Borisova et al. (2012) suggest that state ownership of firms generally has a detrimental effect on the quality of corporate governance, as their objective is not to maximize the firm's value. They also conclude that government intervention is harmful to the quality of corporate governance in civil law countries, but it is beneficial to the quality of corporate governance in common law countries. In addition, Ben-Nasr (2016) claims that state-controlled companies with a low level of net working capital experience a smaller increase in net working capital than those of non-government-controlled companies by using a multinational sample of privatized firms from 54 countries. More recently, Chen et al. (2017) document a strong and robust result that government ownership decreases investment efficiency as measured by investment-Q sensitivity on privatized firms from 64 countries.

However, Borisova et al. (2015) discuss the impact of government ownership on the cost of debt under different circumstances in publicly traded firms from 43 countries. They find that government ownership is positively correlated with cost of debt in non-crisis periods. However, during times of economic or firm distress, state ownership is associated with a lower cost of debt, as state owned firms have relatively easier access to bank credit from the government dominated banking system (Chahrumilind et al. 2006; Faccio et al. 2006; Chaney et al. 2011; Hossain et al. 2013).

According to the above, it is clear that no consensus exists on the relationship between government ownership and funds' performance and market share. Hence, we propose the following null hypothesis:

Hypothesis 1: government ownership would impact upon performance and market share.

2.2.2 Foreign ownership and funds' performance

Based on corporate governance literature, in general, foreign ownership is positively associated with the quality of corporate governance (Djankov and Murrell 2002; Gillan and Starks 2003). In the case of emerging financial markets, the entry of foreign institutional investors enhances human capital, skills and knowledge transfer. Levine (1996) claims that foreign participation in emerging countries' financial market may provide high quality financial services and exert downward pressure on the prices of financial services. In support of this view, Sufian (2009) suggests that foreign-controlled banks perform more efficiently than their domestically controlled counterparts, with reference to the Malaysian banking sector. In addition, foreign-controlled banks have a relatively higher ownership concentration compared with domestic banks, so they are less prone to agency problems between shareholders and management teams. Li et al. (2011) find a negative correlation between foreign ownership and stock return volatility in 31 emerging stock markets and the results are robust even after controlling for potential endogeneity.

By the contrast, Chen et al. (2013) find that foreign institutional ownership has a positive impact on firm-level stock return volatility in China using a sample of 1458 firms from 1998 to 2008. Chen et al. (2016) investigate the relationship between ownership structure and innovation and find a negative correlation between foreign ownership and firm innovation as measured by technological diversity strategies using panel data from 138 Taiwanese firms. However, Huang and Zhu (2015) indicate that foreign institutional investors have a greater impact on firms' corporate governance than local mutual funds (domestic institutional investors) and provide effective monitoring of on firms' operations in Chinese equity market. Lin and Fu (2017) conclude that foreign investors have a larger influence on public firm performance than

domestic investors and point out that institutional investors improve shareholder value by attracting more analysts in China's stock markets using a generalized method of moments estimator. Moreover, Singla et al. (2017) point out that foreign investors improve the market share of a local company, as they demonstrate that foreign institutions have a positive impact on internationalization in a sample of Indian firms.

Consistent with the findings for emerging countries, Ferreira and Matos (2008) claim that firms with a higher level of foreign ownership have a higher quality of governance from 27 countries, for example they have higher firm valuations, a better operating performance and lower capital expenditures. Aggarwal et al. (2011) also state that foreign ownership has a positive impact on a firm's corporate governance, particularly in the case of for non-U.S. firms. In their contemporaneous work, Chen et al. (2017) document that firms with foreign ownership tend to improve their investment efficiency especially in countries with poor national governance institutions. In addition, Bena et al. (2017) state that foreign ownership not only results in an increase in innovative output, but also improves a firm 's operations and firm valuation based on firm level data from 30 countries during the period from 2001 to 2010.

Previous literature postulates that an increase in foreign ownership would positively affect company performance. Thus, the second hypothesis is:

Hypothesis 2: foreign ownership would assert a positive impact on funds' performance and market share.

2.2.3 Ownership concentration

Turning to the ownership concentration, Iannotta et al. (2007) highlight the importance of ownership dispersion for performance. Shleifer and Vishny (1986) argue that there might issues between controlling shareholders and minority shareholders, possible conflicts of interest that could constitute agency problem. In general, a high ownership concentration is beneficial for large shareholders and might damage the financial performance of the firm, as large shareholders seek to reap benefits of control at the expense of outside or minority shareholders (Goergen 2014). In addition, ownership

concentration is related to the separation of ownership from management (Jensen and Meckling, 1976) that could also raise concerns of possible conflicts.

Leech and Leahy (1991) and Lehmann and Weigand (2000) find that ownership concentration negatively affects firm profitability. Jameson et al. (2014) also document that controlling shareholders' board membership in Indian firms negatively affects the performance of these firms. Li et al. (2015) find a similar outcome and point out that a high ownership concentration reduces board effectiveness and decreases the level of internal monitoring of company management in Chinese publicly listed firms. Abdallah and Ismail (2017) further suggest that concentrated ownership leads to less efficient operation in public companies in the Gulf Cooperative Council region. However, Iannotta et al. (2007) argue that ownership concentration has insignificant impact on the performance of banks using a sample of 181 large banks from 15 European countries.

On the other hand, high concentration in ownership may have positive effects on firm value due to the additional monitoring imposed on firms by large shareholders to mitigate principal–agent problems associated with dispersed ownership. As a consequence, highly concentrated ownership results in better firm performance and profitability. This finding is supported by Kaplan and Minton (1994); Hartzell and Starks (2003) and Maury (2006). Dong et al. (2014) reach a similar conclusion with regard to the Chinese banking sector and indicate that firms with concentrated ownership have improved monitoring of their management and promotes prudent operating procedures.

Furthermore, Nguyen et al. (2015) point out that highly concentrated ownership enhances the quality of corporate governance, thereby improving the performance of firms. In addition, they state that this positive effect is stronger in a less developed governance system (Vietnam) than in a well-developed governance system (Singapore). Recently, Dong et al. (2017) found that having a higher ownership concentration has an incremental effect on board characteristics and efficiency in the Chinese banking sector from 2003 to 2011. In addition, Gong et al. (2016) claim that concentrated ownership tends to improve the performance of funds, as they find if a top1 shareholder holds a larger stake in a company, it has a positive impact on fund performance, and

they also find that the presence of multiple large shareholders decreases fund performance using a governance data covering Chinese mutual funds. Based on the above discussion, we propose the following hypothesis:

Hypothesis 3: an increase in ownership concentration would positive affect the funds' performance and market share.

3 Data and Methodology

3.1 Data and sample selection

The main source of mutual fund data is the China Securities Market & Accounting Research (CSMAR) database (also known as the Guo Tai An (GTA) database). This database has been widely used in prior studies (Zhang and Ding 2006; Yuan et al. 2008; Ding et al. 2010; Feng and Johansson 2015; Chizema et al. 2019; Koutmos et al. 2020). The CSMAR database is a leading global provider of Chinese data and produces seven major database series, including: stock market; corporate; bonds; funds; industry; and economy. Information is available both at the fund management company level and at the individual fund level. The sample period is from 2005 to 2015 and includes funds in all investment categories. The year 2005 has been chosen as the commencement year in this paper because open-ended funds were only introduced in 2001, and there is a lack of comprehensive data prior to 2005. In addition, the CSMAR database describes several classifications of investment objectives for each fund. Also, data about the fund management companies' ownership structure have been manually collected from each fund management company' website.

Furthermore, a number of mutual funds contain several share classes, especially in the case of money market mutual funds and bond market mutual funds, and the CSMAR database separates each share class into individual funds. However, these individual funds represent claims on the identical underlying assets and have the same returns before expenses and loads. The only difference lies in their fee structure or in their clientele. In this paper, we aggregate these multiple share classes into one fund. The fund characteristics are calculated based on the TNA-weighted average.

3.1.1 Performance and market share

We construct two measures of mutual funds' performance using their returns from the CSMAR database. The first measure is the funds' return which is calculated by the weighted average of returns across all funds within the same management company (Kong and Tang 2008; Cremers et al. 2009). The second measure is the abnormal return which is the difference between the funds' return and market return.[7] The second method serves as a robustness check. Following the previous study by Khorana and Servaes (2012), market share is calculated by adding together all the assets managed by each fund management company and then dividing this figure by the total managed assets in the open-ended mutual fund industry.

3.1.2 Ownership structure

In line with previous studies, we consider that ownership structure for the following categories: government ownership ratio (GO), government-controlled companies (GCCs), foreign ownership ratio (FO) and foreign invested companies (FICs). Government ownership is the percentage of shares owned by a government agency (Chen et al. 2006; Liang et al. 2013; Fan et al. 2013; Lin et al. 2016). A government-controlled company is a dummy variable that is equal to 1 if the largest shareholder is a government agency and 0 otherwise (Fan et al. 2007; Kwak et al. 2009; Zhang, 2009; Liu et al. 2019). Foreign ownership is the percentage of shares owned by foreign investors (Ferreira and Motas, 2008; Aggarwal et al. 2011; Chen et al. 2013; Chen et al. 2016; Lin and Fu, 2017; Singla et al. 2017). A foreign-invested company is a dummy variable that is equal to 1 if a fund management company has foreign investors and 0 otherwise. Table 2.1 shows the descriptive statistics of the ownership structure and ownership changes over time. The sample mean of state ownership in Panel A of Table 2 is 54.54 percent, which is greater than that of 27.3 percent found in Dong et al (2014)[8] and 23.89 percent calculated by Chen et al (2017).[9] Moreover, our sample mean of 70 percent for state–controlled companies is comparable to that of Dong et al. (2014).

[7] The market return is calculated by 30% of the Shanghai Composite index, 30% of the Shenzhen Composite index and 40% of the Shanghai Government bond index, because approximately 40% of the total assets are invested in the bond market in the Chinese mutual fund industry. Most studies use the average of the Shanghai and Shenzhen market index as the market return (Zeng et al. 2015), as they are only concerned with the performance of equity mutual funds.

[8] Dong et al. (2014) examine the ownership structure in Chinese commercial banks from 2003 to 2011.

[9] Chen et al. (2017) investigate the ownership structure in Chinese privatized firms from 1981 to 2008.

Turning to foreign ownership, the sample mean of foreign ownership is 18.56 percent, while that of fund management companies with foreign investment is 49%, which is similar to the figures of Dong et al. (2014) and 33% by Lassoued et al. (2016). This means that almost half of Chinese mutual fund management companies have foreign investors. In Panel B of Table 2.1, we find that the mean of government-controlled companies was increased sharply from 65% in 2005 to 75% in 2008. At the same time, the average percentage of foreign ownership ratio (FO) was increased from 12.86% to 21.4%. This increase is attributed to the regulation reforms in 2002.

We also use ownership concentration 1, and ownership concentration 2. Ownership concentration1 is measured by the Herfindahl index which is equal to the sums of the squared ownership shares (Dong et al. 2014). High Herfindahl index would indicate the more concentrated the ownership of the mutual fund management company. Ownership concentration 2 is defined as the percentage of share owned by the largest shareholder (Dong et al. 2014). Table 2.1 presents that the mean of the ownership concentration ratio is 0.425. The mean of the largest shareholder's holding is 50.17 percent. In addition, we observe an upward trend in the average ratio of ownership concentration 1 during the sample period, with a stable increase from 0.38 to 0.47.

Table 2.1 Descriptive statistics of the ownership structure

Variables	Mean	SD	MIN	MAX	Median
Panel A: Ownership structure					
GO (%)	54.54	27.59	0	100	52
GCCs	0.7	0.457	0	1	1
FO (%)	18.56	20.44	0	49	0
FICs	0.49	0.5	0	1	0
OC1	0.425	0.13	0.2	1	0.39
OC2	50.17	13.22	20	100	49
Panel B: Year by year ownership structure variables					
Year	GO	GCCs	FO	FICs	OC1
2005	55.0	0.65	12.86	0.36	0.38
2006	56.2	0.69	14.05	0.38	0.37
2007	55.7	0.74	18.97	0.47	0.41
2008	59.0	0.75	21.4	0.54	0.42
2009	54.0	0.7	21.5	0.55	0.42
2010	54.3	0.7	21.4	0.57	0.42
2011	53.3	0.72	21.64	0.58	0.41
2012	53.5	0.69	19.47	0.53	0.41

2013	52.7	0.67	19.11	0.52	0.43
2014	53.8	0.7	17.42	0.48	0.46
2015	55.0	0.71	16.01	0.43	0.47

Note: This table presents summary statistics the mean, standard deviation, minimum, maximum and median values for the variables used in analyzing funds' performance and market share from 2005 to 2015. GO: Government ownership is the percentage of shares owned by a government agency; GCCs: Government–controlled companies is a dummy variable that equal to 1 if the largest shareholder agency and 0 otherwise; FO: Foreign ownership is the percentage of shares owned by foreign strategic investors; FICs: Foreign invested companies is a dummy variable that is equal to 1 if a fund management company has foreign investors and 0 otherwise; OC1: ownership concentration1 is the ownership Herfindahl index (HHI) based on the ownership held by the shareholders of the mutual fund management company; OC2: ownership concentration2 is the percentage of shares owned by the largest shareholder.

3.1.3 Descriptive statistics

The descriptive statistics for fund management company characteristic variables are provided in Table 2.2. Regarding the governance proxy shown in Panel A of Table 2.2, the sample mean of the market share is 1.44%, which is greater than the figures of 0.36% obtained by Khorana and Servaes (2012) for their U.S. sample. The mean of funds' performance is 16%.

In Panel B, we show some descriptive statistics of mutual fund management company specific variables, for instance, expense ratio, company experience, top-1 funds, company size, number of funds started and company focus. The average fund management company's expense ratio is 1.9%. The sample mean of a fund management company's risk is 5.48%, which is slightly higher than that of 3% obtained by Kong and Tang (2008). Furthermore, the average size of a fund management company is 36 billion Chinese Yuan. The average number of new funds started is 3.33. Meanwhile, the average age of a fund management company is 7.41 years. The sample mean of top-1 funds and company focus are 0.08 and 0.44, respectively.

Table 2.2 Summary statistics.

Variables	Mean	SD	MIN	MAX	Median
Panel A: Dependent variables					
Market share (%)	1.44	1.72	0.03	7.8	0.75
Performance (%)	16	34.96	-60.76	158.27	6.99
Panel B: Company-specific					
Expense ratio (%)	1.9	1.3	0.01	19.66	1.76
Risk (%)	5.48	3.51	0.05	22.08	4.89

Company experience	7.41	4.23	1	18	7
Top-1 funds	0.08	0.28	0	1	0
Company focus	0.44	0.24	0.13	1	0.36
Company size (in billions)	36	62.4	0.012	684	15.2
No. of funds stated	3.33	4.23	0	34	2

Note: This table presents summary statistics the mean, standard deviation, minimum, maximum and median values for the variables used in analyzing funds' performance and market share from 2005 to 2015. Market share is calculated by the sum of all assets under management by each company divided by all assets under management in the fund industry; Performance is calculate by the weighted average of raw returns across all funds within the fund management company; Company size is the log of fund management company asset; Expense ratio is calculated by the weighted average of expense ratios across all funds within the fund management company; Risk is the funds' return volatility is calculate by the weighted average of return volatility across all funds within the fund management company; Company experience is the number of years for a fund management company exists in the industry; Company top1 is a dummy variable that equal to 1 if the fund management company has at least on the fund operating in the top1 of a given category in a given year; Company focus is the Herfindahl index based on investment objective in a fund management company; No. of funds started is total number of new funds started by a fund management company in a given year.

3.1.4 Control variables

Turning to control variables, we opt for the following: fund management company size, expense ratio, age, risk-taking behavior, top-1 funds, company focus and number of funds started. More specifically, fund management company size is measured by the log of total net assets managed by the fund management company. Larger fund management companies tend to perform better because of better concessions on trading commissions and more resources for research (Chen et al. 2004). Expense ratio is calculated by the weighted average of expense ratios across all funds within the same fund management company.

Company experience is the number of years that a fund management company has existed in the industry. Fund management companies with greater experience tend to have a better performance. Top-1 funds is a dummy variable that is equal to 1 if the fund management company has at least one fund operating in the top-1 of a given category in a given year. Nanda et al. (2004) find that top-1 (or otherwise called star fund performer) contributes to greater cash inflow to the fund. This means that funds in top-1 might have a positive impact on fund management company market share. Company focus is measured by the Herfindahl index based on a fund management company's investment objective. More focused fund management companies are easier to monitor and to develop expertise, as their investment strategies are less diverse

leading to superior performance and higher market share (Siggelkow 2003). Number of funds started is the total number of new funds started by a fund management company in a given year.

4. Research design

This paper opts for a fixed effect panel estimation to examine the impact of ownership structure on performance and market share. We control for omitted heterogeneous mutual fund management company-specific effects. Hence, the general model for measuring the relationship between a mutual fund management company's ownership structure and performance and market share is:

$$Performance_{i,t} \text{ or } Market\ share_{i,t} = \alpha_{0,t} + \sum_{j=1}^{6} \beta_j\ Ownership\ Structure_{i,t} + \sum_{k=1}^{6} \beta_k\ Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

where t and i denote time period and mutual fund management companies and performance is the dependent variable and reflects funds' performance; market share is the other dependent variable and reflects the ratio of assets managed by the fund management company to all the assets managed by the open-ended mutual fund industry. Ownership structure represents the government ownership ratio (GO), government-controlled companies (GCCs), foreign ownership (GO), foreign invested companies (FICs), ownership concentration1 (OC1) and ownership concentration2 (OC2). CONTROL represents the control variables, namely the fund management company's size, funds' expense ratio, fund management company's age, fund management company's risk-taking behavior, top-1 funds, company focus and number of funds started, while $\varepsilon_{i,t}$ denotes the error term.

4.1 Empirical results

We present next the empirical results relating to whether Chinese mutual fund management company's ownership structure would affect performance and market share after controlling for different mutual fund management company characteristics,

such as, company size, company experience, expense ratio, number of funds started and the degree of fund management company focus.

4.1.1 Ownership, performance and market share

Table 3 reports the regression results of the relationship between ownership structure and funds' performance, see Models 1 and 2 for government ownership and government-controlled companies (GCCs) respectively. Models 3 and 4 examine the relationship between performance and the ownership ratio of foreign ownership and foreign invested companies (GICs) respectively.

Table 3 The relationship between ownership and performance – Fixed effects.

Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.000299	0.000645	0.00565	0.00473
	(0.0114)	(0.0111)	(0.0119)	(0.0119)
Company size	0.0991***	0.0966***	0.106***	0.105***
	(0.0138)	(0.0142)	(0.0147)	(0.0148)
Company experience	-0.205***	-0.197***	-0.209***	-0.210***
	(0.0382)	(0.0386)	(0.0352)	(0.0352)
No. of funds started	-0.281***	-0.281***	-0.275***	-0.274***
	(0.0420)	(0.0419)	(0.0425)	(0.0434)
Top1	-0.0696**	-0.0695**	-0.0700**	-0.0694**
	(0.0305)	(0.0304)	(0.0296)	(0.0293)
Company Focus	0.189**	0.201**	0.198**	0.178**
	(0.0828)	(0.0825)	(0.0809)	(0.0759)
Government ownership	0.00244*			
	(0.00137)			
GCCs		0.122*		
		(0.0677)		
Foreign Ownership			-0.0047***	
			(0.00178)	
FICs				-0.187***
				(0.0662)
Constant	-1.847***	-1.762***	-1.802***	-1.768***
	(0.271)	(0.264)	(0.305)	(0.303)
Observations	731	731	731	731
R^2	0.442	0.441	0.449	0.451

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on performance for the period 2005 to 2015. The dependent variable is the funds' performance. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Expenses is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top1 is a dummy and equals to 1 if the fund management company has at least

on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

The estimated coefficient for the ownership ratio of government ownership is positive and significant in Model 1. The result remains robust at the 10% level of significance, indicating that a higher level of government ownership could promote performance. This means that an increase of one unit in the percentage of government ownership is associated with an increase of approximately 0.2% in the funds' performance. Results show government-controlled companies (GCCs) assert a positive impact (Table 3, Model 2). This implies that government-controlled companies tend to improve their performance, through the use of controlling benefits to monitor managers effectively and to collect important information (Shleifer and Vishny 1986; Grossman and Hart 1980; Borisova et al. 2012). Our finding is consistent with previous studies (Faccio et al. 2006; Chahrumiind et al. 2006; Chaney et al. 2011; Ben-Nasr 2016; Lin et al. 2016).

Furthermore, in Models 3 and 4, we disaggregate the foreign ownership structure into the percentage of foreign ownership and the percentage of companies with foreign investment (FICs). Table 3 reports that foreign ownership asserts a negative effect on funds' at the 1% level of significance (Table 3, Model 3), as in the previous study Chen et al. (2016). Similarly, we find that funds with foreign investment (FICs) would assert a negative impact on performance. The result remains robust at the 1% level of significance (Table 3, Model 4). One of possible explanation is that local fund company invested by foreign firms may be forced to invest in less risky assets. We will investigate the relationship between foreign ownership and risk-taking behavior in late section. In addition, Choi et al. (2012) and Douma et al. (2006) conclude that foreign companies have relational resources and networks abroad and may prefer to focus on the overseas market, especially as the investment is correlated with their core business. Therefore, local fund management companies with foreign ownership may prefer or be forced by foreign firms to invest more resources in overseas markets. However, we notice that fund management companies have relatively poor performance in global

market than local market.[10] Our finding is opposite to that of Dong et al. (2017), Chen et al. (2017), Bena et al. (2017) and Lin and Fu (2017) as they find that foreign ownership results in excellent performance, especially in less developed countries.

Table 4 presents results with market share as the dependent variable. As reported in Table 4, foreign ownership has a negative impact on fund management company's market share (Table 4, Model 1), but it is statistically insignificant. In Model 2, we find that the coefficient of GCCs is statistically significant and negative, indicating that government-controlled companies are associated with a lower market. This implies that government-controlled mutual fund management companies are less competitive than the non-government funds.

Table 4 The relationship between ownership structure and market share-Fixed effects.

Model	Model 1	Model 2	Model 3	Model 4
Expenses	-0.0123	-0.0131	-0.00523	-0.00559
	(0.0383)	(0.0400)	(0.0393)	(0.0402)
Company size	0.446***	0.460***	0.457***	0.458***
	(0.0958)	(0.0979)	(0.0999)	(0.0995)
Company experience	-0.607***	-0.640***	-0.626***	-0.631***
	(0.171)	(0.172)	(0.167)	(0.168)
No. of funds started	-0.133	-0.128	-0.124	-0.122
	(0.161)	(0.160)	(0.158)	(0.157)
Top1	-0.0636	-0.0606	-0.0680	-0.0673
	(0.0759)	(0.0765)	(0.0763)	(0.0762)
Company Focus	0.0956	0.0468	0.0888	0.0528
	(0.472)	(0.441)	(0.460)	(0.463)
Government ownership	-0.00515			
	(0.00826)			
GCCs		-0.708*		
		(0.384)		
Foreign Ownership			-0.00716*	
			(0.00408)	
FICs				-0.332**
				(0.163)
Constant	-7.481***	-7.516***	-7.868***	-7.827***
	(1.975)	(1.973)	(2.261)	(2.245)
Observations	731	731	731	731
R^2	0.218	0.230	0.220	0.222

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on market share for the period 2005 to 2015. The dependent variable is market share. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the

[10] According to CSMAR database, we calculate the average return of investments in global equities for all fund management companies which is much lower than the average fund management company return in our sample period.

percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Concerning the impact of the foreign ownership structure on the market share, we show that the ownership ratio of foreign shareholders has a negative impact on a fund management company's market share at the 10% level of significance (Table 4, Model 3). A similar pattern is observed in Model 4, as the coefficient of companies with foreign investments (FICs) is statistically negative at the 1% level of significance.

Overall, the above discussed findings suggest that fund management companies with foreign ownership are linked with a lower market share and a lower performance than those of without foreign ownership. These results would not support our second hypothesis (H2) which states that foreign ownership would assert a positive impact on funds' performance and market share. However, these results are in line with Hypothesis H1 as it claims that government ownership would impact upon performance and market share.

4.1.2 Concentration of ownership, funds' performance and market share

In this section we focus on the concentration of ownership. Chen et al. (2013) argues that highly concentrated ownership structure to government would make it difficult for foreign investors to become the controlling party. In the descriptive, see Table 2, we show that more than 70% of Chinese fund management companies are controlled by government agencies. In addition, an increase in foreign ownership in a fund management company would also cause more conflicts of interest between domestic shareholders ownership and foreign shareholders. Thus, foreign shareholders might not effectively improve the company's management skills and governance quality. Foreign institutional investors might misunderstand (or not be aware of) the financial and institutional environment in China. For instance, anecdotal evidence claims that a

dominant investment strategy in China is short-term investment strategies, at least as supported by large domestic Chinese funds.

Table 5 presents the results of the regressions that examine how the ownership concentration affects performance and market share. The coefficient on OC1 is negative in the regression of performance (Table 5, Model 1), while the coefficient on OC1 is significantly positive in the regression of the market share (Table 5, Model 3) at the 1% level of significance. In addition, we find that OC2 has a positive impact of on a fund management company's market share at the 10% level of significance (Table 5, Model 4). However, the impact of OC2 on funds' performance is statistically insignificant (Table 5, Model 2).

Table 5 The relationship between ownership concentration and performance and market share-fixed effects.

Dependent variable	Performance		Market share	
Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.000745	0.000582	-0.0191	-0.0157
	(0.0113)	(0.0112)	(0.0395)	(0.0388)
Company size	0.0993***	0.0989***	0.429***	0.439***
	(0.0146)	(0.0144)	(0.100)	(0.0979)
Company experience	-0.201***	-0.202***	-0.641***	-0.631***
	(0.0371)	(0.0372)	(0.159)	(0.163)
No. of funds started	-0.281***	-0.280***	-0.115	-0.130
	(0.0422)	(0.0421)	(0.147)	(0.152)
Top 1	-0.0687**	-0.0686**	-0.0602	-0.0701
	(0.0306)	(0.0307)	(0.0762)	(0.0758)
Company Focus	0.195**	0.195**	0.0875	0.0932
	(0.0825)	(0.0828)	(0.455)	(0.453)
OC1	-0.0480		2.239***	
	(0.192)		(0.761)	
OC2		0.000176		0.0156*
		(0.00145)		(0.00911)
Constant	-1.711***	-1.728***	-8.240***	-8.324***
	(0.290)	(0.290)	(2.273)	(2.321)
Observations	731	731	731	731
R^2	0.438	0.438	0.240	0.229

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership concentration on performance and market share for the period 2005 to 2015. The dependent variable is the funds' performance and market share. For the independent variables the paper adopts OC1: it is herfindahl index based on the ownership held by the shareholders of the mutual fund management company; OC2 is the percentage of shares owned by the largest shareholder; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial

crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Overall, ownership concentration is positively related to market share in line with Hypothesis 3. This means that a higher ownership concentration would increase the incentive for, and power of, large shareholders to monitor management and mitigate the free-rider problem of small shareholders, thus helping to increase the fund management company's market share. This result is supported by previous studies by Dong et al. (2014), Nguyen et al. (2015) and Dong et al. (2017) as they report that highly concentrated ownership promotes the quality of corporate governance and improves monitoring of management. In addition, since we observe government-controlled companies assert a positive impact on funds' performance in Table 3 (Model 2), it appears to capture some ownership concentration effect.

4.1.3 The interaction between government and foreign ownership

Table 6 reports that the coefficient of the interaction term of the ownership ratio of government shareholders and foreign invested companies (FICs) is significantly positive at the 5% significance level (see Model 1). In addition, the interaction term of government-controlled companies (GCCs) and foreign invested companies (FICs) has a positive impact on funds' performance (see Table 6, Model 2) at the 5% significance level. These findings suggest that funds' performance is positively associated with government ownership and government-controlled companies (GCCs) in the presence of some foreign ownership in those funds. Similarly, foreign investment has a positive impact on funds' performance only in the case of companies with a high level of government ownership or companies controlled by a government agency. This result appears to confirm our second hypothesis (H2). In contrast, Chen et al. (2017) find that if the government holds a majority equity stake, the effect of foreign ownership on investment efficiency is declined.

Furthermore, as reported in Model 3 in relation to a funds' market share, the coefficient on the interaction term of government ownership and foreign invested companies (FICs) is positive, but it is statistically insignificant. We also find that a fund management

company's market share is not statistically significantly related to the interaction term of government-controlled companies (GCCs) and foreign invested companies (FICs).

Table 6 Interaction term between government ownership and foreign ownership.

Dependent variable	Performance		Market share	
Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.00588	0.00608	-0.00131	-0.00537
	(0.0125)	(0.0122)	(0.0388)	(0.0405)
Company size	0.107***	0.104***	0.462***	0.472***
	(0.0150)	(0.0153)	(0.0977)	(0.0987)
Company experience	-0.218***	-0.211***	-0.630***	-0.657***
	(0.0359)	(0.0364)	(0.167)	(0.171)
No. of funds started	-0.281***	-0.279***	-0.126	-0.118
	(0.0433)	(0.0436)	(0.156)	(0.157)
Top1	-0.0665**	-0.0684**	-0.0605	-0.0616
	(0.0294)	(0.0295)	(0.0765)	(0.0764)
Company Focus	0.163**	0.170**	0.0500	0.0125
	(0.0772)	(0.0761)	(0.461)	(0.441)
Government ownership	0.000935		-0.00800	
	(0.00124)		(0.00812)	
FICs	-0.348***	-0.345***	-0.597*	-0.372*
	(0.0932)	(0.0652)	(0.359)	(0.206)
Government ownership*FICs	0.00354**		0.00401	
	(0.00162)		(0.00625)	
GCCs		0.0892		-0.720*
		(0.0769)		(0.382)
GCCs*FICs		0.219**		0.0471
		(0.0852)		(0.231)
Constant	-1.833***	-1.800***	-7.456***	-7.595***
	(0.280)	(0.282)	(1.913)	(1.957)
Observations	731	731	731	731
R^2	0.455	0.457	0.228	0.237

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on performance and market share for the period 2005 to 2015. The dependent variable is the funds' performance and market share. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Government ownership*FICs is the interaction term between government ownership and foreign invested companies; GCCs*FICs is the interaction term between government-controlled companies and foreign invested companies; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Tables 7.1 and 7.2 report the results for the interaction terms of ownership concentration and government ownership. We find evidence that a high degree of ownership concentration might improve the performance of government-controlled companies (GCCs), as the coefficient on ownership concentration 2 and government-controlled companies (GCCs) is significantly positive (see Table 7.1, Model 4) at the 5% significance level. This result further confirms our first hypothesis (H1) and suggests that a highly concentrated government ownership could promote funds' performance. By contrast, Gunasekarage et al. (2007) find that a highly concentrated government-controlled company has a negative and significant impact on its performance.

Table 7.1 Interaction term between government ownership and ownership concentration.

Dependent variable	Performance			
Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.00107	0.000687	0.000513	0.000431
	(0.0114)	(0.0111)	(0.0114)	(0.0111)
Company size	0.0999***	0.0968***	0.0982***	0.0956***
	(0.0142)	(0.0145)	(0.0140)	(0.0144)
Company experience	-0.200***	-0.197***	-0.203***	-0.198***
	(0.0376)	(0.0379)	(0.0380)	(0.0384)
No. of funds started	-0.280***	-0.281***	-0.278***	-0.278***
	(0.0424)	(0.0427)	(0.0425)	(0.0428)
Top 1	-0.0724**	-0.0732**	-0.0685**	-0.0694**
	(0.0304)	(0.0309)	(0.0306)	(0.0309)
Company Focus	0.192**	0.200**	0.189**	0.198**
	(0.0812)	(0.0803)	(0.0818)	(0.0806)
Government ownership	-0.000961		-0.000295	
	(0.00295)		(0.00278)	
OC1	-0.974	-0.783		
	(0.622)	(0.638)		
Government ownership*OC1	0.00991			
	(0.00654)			
GCCs		-0.187		-0.261
		(0.243)		(0.200)
GCCs*OC1		0.844		
		(0.650)		
OC2			-0.00509	-0.00604
			(0.00405)	(0.00371)
Government ownership*OC2			5.76e-05	
			(4.46e-05)	
GCCs*OC2				0.00798*
				(0.00406)
Constant	-1.512***	-1.473***	-1.589***	-1.452***
	(0.318)	(0.328)	(0.327)	(0.319)
Observations	731	731	731	731

R^2	0.445	0.444	0.443	0.444

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on performance and market share for the period 2005 to 2015. The dependent variable is the funds' performance and market share. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Ownership concentration1 is Herfindahl index based on the ownership held by the shareholders of the mutual fund management company; Ownership concentration2 is the percentage of shares owned by the largest shareholder; Government ownership*OC1 is the interaction term between government ownership and ownership concentration1; GCCs*OC1 is the interaction term between government-controlled companies and ownership concentration1; Government ownership*OC2 is the interaction term between government ownership and ownership concentration2; GCCs*FICs is the interaction term between government-controlled companies and foreign invested companies; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Furthermore, according to Models 5 and 7 of Table 7.2, the market share of companies with increased ownership concentration is higher for fund management companies that have a greater proportion of government ownership. The estimated coefficients on the interaction term are statistically significant. We also find a significantly positive relationship between market share and the interaction term of ownership concentration and government-controlled companies in Models 6 and 8 of Table 7.2. Thus, a higher level of ownership concentration would increase the market share. In other words, fund management company's quality of governance is positively correlated with government ownership in the case of those companies with highly concentrated ownership. This finding would support our third hypothesis (H3).

With respect to the effect of control variables, we find that the expense ratio has no impact on funds' performance and market share. This result does not support the findings of Khorana and Servaes' (2012) study, which claims that the expense ratio has a negative and highly significant impact on market share. Additionally, the coefficients on fund management company size are significantly positive for both funds' performance and market share across all models. This finding is consistent with the previous study by Chou et al. (2011).

Turning now to the impact of company experience, it has a negative impact on funds' performance and market share in all models. The results remain robust at the 1% significance level. These results illustrate that an increase in a fund management company's age does not improve performance and market share. In addition, the number of new funds stated has a negative effect on a funds' performance and market share. However, the results are only statistically significant for funds' performance. The negative effect could be caused by the extra expenses involved in opening new funds or the dilution in management focus as a result of establishing new funds. This finding is not in line with the study by Khorana and Servaes (2012).

Table 7.2 Interaction term between government ownership and ownership concentration.

Dependent variable	Market share			
Model	Model 5	Model 6	Model 7	Model 8
Expenses	-0.0176	-0.0202	-0.0147	-0.0167
	(0.0377)	(0.0407)	(0.0373)	(0.0399)
Company size	0.419***	0.442***	0.426***	0.450***
	(0.0915)	(0.0985)	(0.0922)	(0.0980)
Company experience	-0.608***	-0.671***	-0.607***	-0.661***
	(0.155)	(0.161)	(0.159)	(0.167)
No. of funds started	-0.0971	-0.107	-0.106	-0.114
	(0.145)	(0.146)	(0.148)	(0.150)
Top 1	-0.0649	-0.0699	-0.0604	-0.0644
	(0.0784)	(0.0786)	(0.0763)	(0.0772)
Company Focus	0.143	0.0416	0.124	0.0454
	(0.447)	(0.424)	(0.452)	(0.430)
Government ownership	-0.0350***		-0.0309**	
	(0.0120)		(0.0144)	
OC1	-1.495	-0.786		
	(1.128)	(0.832)		
Government ownership*OC1	0.0561***			
	(0.0157)			
GCCs		-2.133***		-2.071***
		(0.650)		(0.724)
GCCs*OC1		3.704***		
		(0.956)		
OC2			-0.00754	-0.00504
			(0.0100)	(0.00678)
Government ownership*OC2			0.000392*	
			(0.000220)	
GCCs*OC2				0.0278**
				(0.0135)
Constant	-5.923***	-6.811***	-6.363***	-7.024***
	(1.709)	(1.842)	(2.030)	(2.103)
Observations	731	731	731	731
R^2	0.267	0.265	0.249	0.252

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on performance and market share for the period 2005 to 2015. The dependent variable is the funds' performance and market share. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Ownership concentration1 is Herfindahl index based on the ownership held by the shareholders of the mutual fund management company; Ownership concentration2 is the percentage of shares owned by the largest shareholder; Government ownership*OC1 is the interaction term between government ownership and ownership concentration1; GCCs*OC1 is the interaction term between government-controlled companies and ownership concentration1; Government ownership*OC2 is the interaction term between government ownership and ownership concentration2; GCCs*FICs is the interaction term between government-controlled companies and foreign invested companies; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Additionally, we find that the top-performing fund has a negative impact on funds' performance. This finding means that the presence of a top-performing fund in a fund management company's portfolio reduces the funds' performance. However, the negative coefficient on the top-performing fund is not statistically significant with regard to fund management company's market share. This result is not consistent with the study by Khorana and Servaes (2012), as they state that the presence of a top–performing fund has a positive and significant impact. Finally, we also find that the Herfindahl index across objectives (Company focus) has a positive and significant impact on funds' performance, while its influence on the company's market share is insignificant. This finding shows that more focused fund management companies are able to deliver higher returns in Chinese mutual fund market (Siggekow 2003).

4.1.4 Dealing with endogeneity: the GMM estimation

To address endogeneity issues, we follow Khorana and Servaes (2012) and adopt the two-step system dynamic GMM estimators (Arellano and Bover 1995; Blundell and Bond 2000) with bias–corrected robust standard errors, which was introduced by

Windmeijer (2005).[11] The endogeneity issue might arise as ownership structure may be determined by performance or market share. In order to apply the dynamic GMM approach, we include one lag of dependent variable as an independent variable in the regression. The results of the two–step system GMM estimator are tested via Hansen's diagnostic test for instrument validity, and by Arellano and Bond's (1991) test for second–order autocorrelation of the error terms. As shown in the model presented in equations (2), we regress the performance and market share on a set of ownership structure and control variables, as follows:

$$Performance_{i,t} \text{ or } Market\ share_{i,t} = \alpha_0 + \beta_1 Performance_{i,t-1} + \sum_{j=1}^{6} \beta_j\ Ownership\ structure_{i,t} + \sum_{k=1}^{6} \beta_k\ Control_{i,t} + \varepsilon_{i,t}$$

(2)

Tables 8, 9 and 10 address the endogeneity issue by employing the two–step 'system' dynamic GMM approach. Moreover, regarding the basic diagnostics, the tests AR(2) for second order autocorrelation in second differences and the Hansen J–statistics of over–identifying restrictions are insignificant in all the corresponding models (see Tables 8, 9 and 10). The instrument variables are the lag of each independent variable.

Table 8 The relationship between ownership structure and performance – GMM

Dependent variable	Performance			
Model	Model 1	Model 2	Model 3	Model 4
L. Performance	0.255***	0.205***	0.264***	0.263***
	(0.051)	(0.0588)	(0.058)	(0.0606)
Expenses	-0.0330*	-0.141***	-0.0380	-0.0368
	(0.0191)	(0.0464)	(0.0243)	(0.0258)
Company size	0.0499**	0.0683*	0.0411	0.0414
	(0.0241)	(0.0364)	(0.0300)	(0.0292)
Company experience	-0.0147	-0.137	0.0385	0.0513
	(0.0603)	(0.110)	(0.0619)	(0.0602)
No. of funds started	-0.313***	-0.232***	-0.310***	-0.310***
	(0.0538)	(0.0839)	(0.0524)	(0.0675)
Top1	-0.0687*	-0.425**	-0.0717*	-0.0623
	(0.0391)	(0.163)	(0.0387)	(0.0390)
Company Focus	0.598***	0.944***	0.614***	0.614***
	(0.129)	(0.220)	(0.126)	(0.125)
Government ownership	0.00408**			
	(0.00166)			
GCCs		0.443***		
		(0.163)		
Foreign Ownership			-0.009***	

[11] This paper employs Roodman's (2009) "Xtabond2" specification in Stata.

			(0.00308)	
FICs				-0.375***
				(0.0979)
Constant	-1.237**	-1.459*	-0.754	-0.762
	(0.519)	(0.801)	(0.636)	(0.622)
Observations	637	637	637	637
AR (2)	0.235	0.508	0.277	0.351
Hansen p value	0.357	0.446	0.564	0.42

Note: The table reports results of the GMM estimator investigating the contractual mutual fund management company's ownership structure on performance for the period 2005 to 2015. The dependent variable is the funds' performance. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; L.Performance is the one year lagged of funds' performance; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

The two–step system dynamic GMM estimation results for the impact of ownership structure on funds' performance are presented in Table 8. We find that the coefficients on government ownership and government–controlled fund management companies are both positive and statistically significant at the 5% (see Table 8, Model 1) level and at the 1% significance level (see Table 8, Model 2). However, the coefficients on foreign ownership and foreign invested companies are both statistically negative at the 1% (see Table 8, Models 3 and 4) significance level. These results are in line with the previous studies by Chen et al. (2013) and Chen et al. (2016).

With regard to a fund's market share, see Table 9, the results indicate that government-controlled companies (GCCs) are negatively associated with market share. This association is statistically significant at the 5% (see Table 9, Model 2) level. In Models 3 and 4, we find that the coefficients for foreign ownership and foreign invested companies (FICs) load negatively at the 5% level, suggesting that a higher level of foreign ownership (or foreign participation) could reduce a funds' market share.

Table 9 The relationship between ownership structure and market share-GMM

Dependent variable	Market share			
Model	Model 1	Model 2	Model 3	Model 4
L.Market share	0.621***	0.492***	0.535***	0.525***
	(0.0798)	(0.0868)	(0.0852)	(0.0843)
Expenses	-0.510***	-0.0982	-0.0704	-0.0725
	(0.156)	(0.0765)	(0.0732)	(0.0721)
Company size	0.107	0.392***	0.308***	0.306***
	(0.111)	(0.0632)	(0.0669)	(0.0656)
Company experience	0.0108	0.0845	-0.0290	0.00919
	(0.162)	(0.168)	(0.157)	(0.151)
No. of funds started	-0.228	-0.692***	-0.192	-0.198
	(0.170)	(0.216)	(0.151)	(0.148)
Top1	0.0209	-0.0468	0.00562	0.0227
	(0.101)	(0.0970)	(0.0835)	(0.0806)
Company Focus	0.150	0.654	0.488	0.522
	(0.543)	(0.438)	(0.402)	(0.396)
Government ownership	-0.00132			
	(0.00439)			
GCCs		-0.889**		
		(0.444)		
Foreign Ownership			-0.0160**	
			(0.00720)	
FICs				-0.535**
				(0.236)
Constant	-0.921	-7.789***	-6.165***	-6.211***
	(2.704)	(1.365)	(1.523)	(1.481)
Observations	637	637	637	637
AR (2)	0.407	0.992	0.939	0.943
Hansen p value	0.339	0.393	0.27	0.301

Note: The table reports results of the GMM estimator investigating the contractual mutual fund management company's ownership structure on market share for the period 2005 to 2015. The dependent variable is fund management company's market share. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; L.Market share is the one year lagged of fund management company's market share; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Finally, Table 10 reports the system GMM estimation results for how the ownership concentration ratio affects funds' performance and market share. The results reveal that the ownership concentration ratio has no impact on funds' performance and market share according to Models 1 and 2. Furthermore, we find that the coefficients on ownership concentration1 and ownership concentration2 are both significantly positive

at the 1% significance level (see Table 10, Model 3) and 10% level of significance (see Table 10, Model 4), indicating that a further increase in ownership concentration would promote the growth of a fund management company in the Chinese market (Dong et al. 2014; Nguyen et al. 2015; Dong et al. 2017). Overall, these findings are generally consistent with the main findings from the fixed effect models (from Table 3 to Table 5).

Table 10 The relationship between ownership concentration and performance and market share-GMM

Dependent variable	Performance		Market share	
Model	Model 1	Model 2	Model 3	Model 4
L. Performance	0.259***	0.282***		
	(0.0537)	(0.0643)		
L.Market share			0.886***	0.878***
			(0.0828)	(0.0884)
Expenses	-0.0360*	-0.190***	-0.160*	-0.156**
	(0.0203)	(0.0407)	(0.0838)	(0.0776)
Company size	0.0558**	0.0504	-0.104	-0.0874
	(0.0268)	(0.0341)	(0.154)	(0.161)
Company experience	0.00175	-0.112	0.0505	0.0529
	(0.0543)	(0.101)	(0.179)	(0.198)
No. of funds started	-0.298***	-0.281***	0.444**	0.395
	(0.0389)	(0.0762)	(0.220)	(0.244)
Top 1	-0.0776*	-0.668***	-0.0539	0.217
	(0.0399)	(0.221)	(0.100)	(0.498)
Company Focus	0.670***	0.759***	0.634*	0.688
	(0.116)	(0.169)	(0.358)	(0.501)
Ownership concentration1	-0.502		1.744***	
	(0.437)		(0.637)	
Ownership concentration2		0.000857		0.0158*
		(0.00377)		(0.00877)
Constant	-1.007*	-0.618	1.674	1.206
	(0.537)	(0.669)	(3.311)	(3.462)
Observations	731	731	731	731
AR (2)	0.306	0.365	0.835	0.803
Hansen p value	0.378	0.355	0.254	0.195

Note: The table reports results of the GMM estimator investigating the contractual mutual fund management company's ownership structure on performance and market share for the period 2005 to 2015. The dependent variable is the funds' performance and market share. For the independent variables the paper adopts ownership concentration1: it is herfindahl index based on the ownership held by the shareholders of the mutual fund management company; Ownership concentration2 is the percentage of shares owned by the largest shareholder; L.Performance is the one year lagged of funds' performance; L.Market share is the one year lagged of fund management company's market share; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

4.1.5 Further analysis of the impact of foreign ownership

As previous discussed, foreign ownership has a negative impact on funds' performance and market share in China. In order to further explain this finding, we examine the impact of foreign ownership on funds' risk-taking behavior. The results are reported in Table 11. We find that the government ownership has a positive and statistically insignificant impact on a funds' risk-taking behavior in Model 1. The result is similar when the government-controlled companies (GCCs) variable is employed in Model 2. The relationship between risk-taking behavior and government-controlled companies (GCCs) is positive but statistically insignificant. The insignificant results for government ownership suggest that government shareholders cannot help fund management companies to improve their level of risk control. The findings are inconsistent with the previous study by Tee et al. (2018), as they claim that politically connected firms are positively connected with risk level.

Table 11 The relationship between ownership structure and risk-taking-Fixed effect.

Dependent variable	Risk-taking			
Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.824***	0.826***	0.874***	0.862***
	(0.258)	(0.261)	(0.252)	(0.252)
Company assets	1.496***	1.473***	1.563***	1.551***
	(0.201)	(0.209)	(0.211)	(0.209)
Company experience	-2.577***	-2.516***	-2.623***	-2.632***
	(0.459)	(0.470)	(0.438)	(0.432)
No. of funds started	-2.432***	-2.439***	-2.377***	-2.377***
	(0.483)	(0.483)	(0.485)	(0.488)
Top1	-0.167	-0.170	-0.175	-0.169
	(0.270)	(0.270)	(0.273)	(0.272)
Company Focus	1.205	1.295	1.269	1.088
	(1.121)	(1.103)	(1.085)	(1.022)
Government ownership	0.0134			
	(0.0189)			
GCCs		1.145		
		(1.336)		
Foreign Ownership			-0.0442**	
			(0.0210)	
FICs				-1.607**
				(0.761)
Constant	-26.53***	-26.22***	-26.60***	-26.24***
	(3.996)	(3.993)	(4.514)	(4.477)
Observations	731	731	731	731
R^2	0.254	0.255	0.264	0.263

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on risk for the period 2005 to 2015. The dependent variable is the funds' risk-taking. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Expense is the funds' expense

ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Furthermore, with regard to foreign ownership, Table 11 reveals that the coefficient on the ownership ratio of foreign shareholders is significantly negative in Model 3, suggesting that a higher level of foreign ownership in a fund management company means that the company tends to take fewer risks. We also find that foreign investment (FICs) has a negative impact on a funds' risk-taking hehavior at the 5% (Table 11, Model 4) significance level. This is in line with several previous studies (Umutlu et al. 2010; Li et al. 2011; Lassoued et al. 2016), but contradicts the findings of Chen et al. (2013) and partially contradicts with the findings of Lee and Hsieh (2014). Lee and Hsieh (2014) offer evidence that foreign ownership has an inverse U–shaped impact on stability in the banking industry. Furthermore, this finding helps to explain the negative correlation between foreign ownership and funds' performance and market share, as foreign shareholders might prefer to invest in less risky assets.

Table 12 shows the GMM estimation regressions so as to address concerns regarding endogeneity. Results remain consistent with the main findings above in Table 11. Note that there is a significant dynamic adjustment as indicated by the coefficient of lagged risk. Moreover, once more we find that the coefficient on the ownership ratio of foreign shareholders is significantly negative in Model 3, suggesting that a higher level of foreign ownership in a fund management company means that the company tends to take fewer risks. Similarly, the coefficient of FICs, indicating funds with foreign investment, is highly significant and negative, whilst also it carries a big magnitude. It seems indeed that foreign investors are not keen to invest in risky funds.

Table 12 The relationship between ownership structure and risk-taking-GMM.

Dependent variable	Risk-taking			
Model	Model 1	Model 2	Model 3	Model 4
L. Risk	0.310**	0.210*	0.337**	0.341**
	(0.150)	(0.107)	(0.140)	(0.135)
Expenses	0.368	0.375	0.388	0.446
	(0.402)	(0.407)	(0.342)	(0.298)

Company size	1.168***	1.616***	1.119***	1.146***
	(0.391)	(0.419)	(0.413)	(0.355)
Company experience	-0.217	-2.019**	-0.158	-0.188
	(0.656)	(0.801)	(0.602)	(0.621)
No. of funds started	-3.794***	-2.721***	-3.520***	-3.545***
	(0.735)	(0.957)	(0.691)	(0.741)
Top1	-0.117	0.116	-0.0641	-0.108
	(0.439)	(0.449)	(0.399)	(0.411)
Company Focus	5.627***	7.304***	5.670***	5.358***
	(2.016)	(1.856)	(1.561)	(1.680)
Government ownership	0.0115			
	(0.0253)			
GCCs		2.527		
		(1.789)		
Foreign Ownership			-0.0669**	
			(0.0328)	
FICs				-2.848**
				(1.205)
Constant	-24.73***	-33.58***	-22.08**	-22.45***
	(7.969)	(8.712)	(8.618)	(7.539)
Observations	637	637	637	637
AR(2)	0.129	0.188	0.118	0.119
Hansen p value	0.31	0.503	0.362	0.273

Note: The table reports results of the GMM estimator investigating the contractual mutual fund management company's ownership structure on risk for the period 2005 to 2015. The dependent variable is funds' risk-taking. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; L.risk is the one year lagged of funds' risk-taking; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

4.1.6 Robustness Check

As robustness we measure funds' performance as abnormal return. Abnormal return is the difference between the funds' return and market return. Results remain relatively consistent with the prior main findings, see Models 3 and 4. However, the positive relationship between government ownership and funds' performance is weakened when we take into account abnormal market return into the model. This finding is comparable with study by Berkowitz and Qiu (2003), as they state that ownership structure of mutual fund management companies is irrelevant with funds' risk-adjusted returns.

This finding also helps to explain the negative relationship between government ownership and market share, as government-controlled fund management companies might perform inferior compared to capital market.

Table13 The relationship between ownership structure and performance (Robustness Check).

Dependent variable	Performance			
Model	Model 1	Model 2	Model 3	Model 4
Expenses	0.00245	0.00259	0.00483	0.00436
	(0.0112)	(0.0111)	(0.0114)	(0.0113)
Company size	0.0422***	0.0411***	0.0453***	0.0449***
	(0.0109)	(0.0110)	(0.0112)	(0.0114)
Company experience	0.00977	0.0132	0.00820	0.00755
	(0.0301)	(0.0300)	(0.0287)	(0.0290)
No. of funds started	-0.104***	-0.104***	-0.101***	-0.101***
	(0.0258)	(0.0258)	(0.0259)	(0.0260)
Top 1	-0.0689***	-0.0688***	-0.0691***	-0.0688***
	(0.0235)	(0.0235)	(0.0236)	(0.0233)
Company Focus	0.0831	0.0882	0.0871	0.0780
	(0.0685)	(0.0674)	(0.0675)	(0.0654)
Government ownership	0.00103			
	(0.000947)			
GCCs		0.0528		
		(0.0583)		
Foreign Ownership			-0.00210*	
			(0.00117)	
FICs				-0.0807*
				(0.0441)
Constant	-1.020***	-0.984***	-1.003***	-0.987***
	(0.234)	(0.231)	(0.245)	(0.245)
Observations	731	731	731	731
R^2	0.115	0.115	0.120	0.121

Note: The table reports results of the fixed effect models investigating the contractual mutual fund management company's ownership structure on performance for the period 2005 to 2015. The dependent variable is funds' performance which is measured by abnormal return. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

Table 14 reports GMM estimations so as to take into account issues related to the endogeneity. Once more, we confirm that the ownership ratio of foreign shareholders asserts a significantly negative impact see Model 3, whilst foreign investment also carries a negative sign see Model 4.

Table 14 The relationship between ownership structure and performance-GMM (Robustness Check).

Dependent variable	Performance			
Model	Model 1	Model 2	Model 3	Model 4
L. Performance	-0.111**	-0.106**	-0.104**	-0.100**
	(0.0477)	(0.0413)	(0.0469)	(0.0427)
Expenses	0.0167	0.0181	0.0214	0.0194
	(0.0170)	(0.0167)	(0.0214)	(0.0158)
Company size	0.0607***	0.0576***	0.0629***	0.0621***
	(0.0168)	(0.0134)	(0.0162)	(0.0157)
Company experience	-0.00773	-0.00844	-0.0137	-0.0124
	(0.0256)	(0.0282)	(0.0321)	(0.0283)
No. of funds started	-0.149***	-0.142***	-0.141***	-0.141***
	(0.0353)	(0.0337)	(0.0332)	(0.0330)
Top 1	-0.0458	-0.0469*	-0.0495*	-0.0501**
	(0.0276)	(0.0253)	(0.0268)	(0.0249)
Company Focus	0.102	0.103	0.0971	0.0943
	(0.0885)	(0.0951)	(0.0906)	(0.0951)
Government ownership	0.000526			
	(0.00151)			
GCCs		0.0889		
		(0.0893)		
Foreign Ownership			-0.00262*	
			(0.00146)	
FICs				-0.101*
				(0.0559)
Constant	-1.406***	-1.372***	-1.378***	-1.355***
	(0.379)	(0.307)	(0.353)	(0.348)
Observations	637	637	637	637
AR (2)	0.393	0.37	0.347	0.349
Hansen p value	0.678	0.651	0.447	0.484

Note: The table reports results of the GMM estimator investigating the contractual mutual fund management company's ownership structure on performance for the period 2005 to 2015. The dependent variable is the funds' performance which is measured by abnormal return. For the independent variables the paper adopts government ownership: it is the percentage of share owned by a government agency; GCCs is the government-controlled companies and equal to 1 if the largest shareholder is a government agency and 0 otherwise; Foreign ownership is the percentage of share owned by foreign investors; FICs is the foreign invested companies and equals to 1 if a fund management company has foreign investments and 0 otherwise; L.Performance is the one year lagged of funds' performance; Expense is the funds' expense ratio; Company size the log of total net assets managed by the fund management company; Company experience is the number of years of a fund management company exists in the industry; No of funds started is the total number of funds started by a fund management company in a given year; Top 1 is a dummy and equals to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year; Company focus is the Herfindahl index of investment objective in

a fund management company and is the sum of squared fractions of each investment objective's share in total fund management company value; the financial crisis period from 2008 to 2009 is a series of year dummy variables and is not reported in this table, for instance, the year of 2008 which takes the value of 1 if the year is 2008 and the value of 0 otherwise. The numbers in the parentheses are corrected standard errors, *significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.

5 Conclusions

The Chinese financial sector has undergone several important reforms during the recent decades, particularly in the mutual fund industry. The mutual fund industry is characterized by highly concentrated corporate ownership structure and weak minority shareholder protection. Against this background of concentrated ownership, we investigate the impact of ownership structure on funds' performance and market share over the period 2005-2015, employing manually collected data.

Our evidence suggests that government ownership tends to have a greater influence on funds' performance than market share, as we find that government ownership is positively related with funds' performance and find that insignificant relationship between government ownership and market share. These results are in line with our hypotheses and are consistent with previous studies (Faccio et al. 2006; Chahrumiind et al. 2006; Chaney et al. 2011; Ben-Nasr 2016; Lin et al. 2016).

In addition, we find that foreign ownership and fund management companies with foreign investors are not only linked to a lower level of funds' performance but also to a lower market share. This finding is consistent with the previous study Chen et al. (2016). Further investigation reveals that fund management companies with foreign investors have also lower risk level. The result suggests that negative relationship between foreign ownership and funds' performance and market share is contributed by foreign shareholders prefer to invest in less risky assets.

We also find that government-controlled companies have a statistically positive association with funds' performance. This is consistent with the findings of Faccio et al. (2006), Chahrumiind et al. (2006), Chaney et al. (2011), Ben-Nasr (2016) and Lin et al. (2016) but is in contrast to the findings of Chen et al. (2017). However, the opposite is true for the relationship between government-controlled fund management company and market share. What is more, highly concentrated ownership tends to enhance market share. We find an insignificant relationship between concentrated

ownership and funds' performance. This result is supported by previous studies by Dong et al. (2014), Nguyen et al. (2015) and Dong et al. (2017) as they report that highly concentrated ownership promotes the quality of corporate governance and improves monitoring of management.

Furthermore, when we examine the effects of the interaction terms on government ownership and foreign ownership, we find that funds' performance is positively associated with government ownership for companies with foreign ownership as well, and that there is also a positive relationship between funds' performance and government–controlled companies (GCCs) with foreign ownership. Moreover, we discover that the funds' performance and market share are positively correlated with government ownership in the case of highly concentrated ownership. Finally, we conclude that foreign ownership has a negative impact on funds' risk-taking behavior. These results are robust under GMM estimations.

Our findings are of importance for policymakers. Moreover, we argue that concentrated ownership in a government–controlled company would improve performance and increase market share, suggesting that regulators should be cautious about dispersing ownership. In addition, although we find that government ownership has a positive impact on funds' performance, an ever-higher level of government ownership will reduce its market share, especially in the case of government-controlled companies.

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Appendix

Table A1 Definitions of Variables

Variable	Description	Sources
Government ownership	The percentage of shares owned by a government agency	Annual reports
GCCs	A dummy variable that equal to 1 if the largest (controlling) shareholder is a government agency and 0 otherwise	Annual reports
Foreign ownership	The percentage of shares owned by foreign strategic investors	Annual reports
FICs	A dummy variable that equal to 1 if a fund management company has foreign investment and 0 otherwise	Annual reports
OC1	Herfindahl index based on the ownership held by the shareholders of the mutual fund management company	Annual reports
OC2	The percentage of shares owned by the largest shareholder	Annual reports
Expense ratio	The fund management company's expense ratio	CSMAR
Return	The fund management company's return	CSMAR
Risk	The fund management company's return volatility	CSMAR
Market share	The ratio of assets managed by the fund management company and all assets managed by the open-end mutual fund industry	CSMAR
Company Size	The log of total net assets managed by the fund management company	CSMAR
No. of funds started	The total number of new funds started by a fund management company in a given year	CSMAR
Company top1	A dummy variable that equal to 1 if the fund management company has at least on fund operating in the top 1 of a given category in a given year	CSMAR
Company focus	Herfindahl index based on investment objective in a fund management company	CSMAR
Company experience	The number of years for a fund management company exists in the industry	CSMAR

Table A2 Correlation matrix of independent variables

	1	2	3	4	5	6
1-Government ownership	1					
2-GCCs	**0.76**	1				
3-Foreign ownership	-0.29	-0.05	1			
4-FICs	-0.22	-0.01	**0.92**	1		
5-OC1	0.09	0.1	0.3	0.28	1	
6-OC2	0.18	0.14	0.1	0.17	**0.87**	1
7-Expense	-0.15	-0.15	0.07	0.04	-0.02	-0.07
8-Company size*	0.14	0.16	0.08	0.14	0.02	0.03
9-Company age	0.12	0.1	-0.001	0.03	-0.19	-0.19
10-No. of funds started	0.06	0.05	0.004	0.06	-0.02	0.01
11-Company top1	-0.06	-0.04	0.05	0.06	-0.04	-0.05
12-Company focus	-0.08	-0.11	-0.11	-0.16	0.05	0.08

(*Continued*)

	7	8	9	10	11	12
7-Expenses	1					
8-Company size*	-0.22	1				
9-Company age	-0.02	0.65	1			
10-No. of funds started	-0.23	0.58	0.44	1		
11-Company top1	0.03	0.03	0.02	0.04	1	
12-Company focus	0.05	-0.59	-0.69	-0.46	-0.04	1

Notes: Pearson correlation coefficients for independent variables from 2005 to 2015. The variable with an asterisk (*) is measured in logarithmic; Independent variables with high correlation coefficients are marked boldface.

Table A2 presents all the correlation coefficients of the independent variables. We find that almost all of the correlation coefficients are below the value of 0.4. This means that the independent variables in the regressions are not highly correlated.

Table A3. Variables used to analyze the relationship between ownership structure and fund performance

Variables used in similar studies	Variables used in this study
Fund size	Fund size
The size of fund management company	The size of fund management company
Fund age	
Fund management company's age	Fund management company's age
Expense ratio	Expense ratio
Management fee	
Return	Return
Abnormal return	Abnormal return
Carhart's four-factor alpha	
Fama-French three-factor alpha	
Volatility of return (Risk)	Volatility of return (Risk)
Cash flow	
Performance persistence	Performance persistence
Turnover	
Market share	Market share
The number of funds	
	The number of funds started each year
	Fund management company's focus
Manager's tenure	
	Company top1