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Institutional stock ownership and firms' cash dividend policies: Evidence from China ☆

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ABSTRACT

Agency theory suggests that outside shareholders prefer higher dividend payouts in order to reduce the free cash flows of firms that are under the insiders' control. Our study investigates the effects of mutual funds, typically the most important and influential type of outside shareholder, on firms' dividend payouts in China during the period from 2003 to 2011. We find that mutual funds influence firms to pay higher cash dividends. The results are consistent with the predictions from exit theory. The effects are more pronounced in firms controlled by state and regional governments and in firms with relatively higher free cash flows. We also find evidence that the mutual funds' effects are stronger when their investment horizon is longer and the ownership interest is larger. Other institutional investors, such as banks, insurance companies, and securities companies have a lower exit threat and do not have an influence on firms' cash dividend payments or financial performances.

1. Introduction

The effects of institutional investors' share ownership on listed firms have been widely studied in developed countries (Chen et al., 2007; Ferreira and Matos, 2008; Ferreira et al., 2010; Aggarwal et al., 2011), but there is much less investigation of their counterparts in developing countries. Since 2000, China, the biggest emerging market in the world, has made substantial efforts to develop financial institutions with the avowed intention that these investors will improve the efficiency and corporate governance of listed firms and help stabilize the stock markets. In light of this, the securities mutual fund industry has grown rapidly and become the largest institutional investor in China's stock markets. Previous research has concluded that mutual funds in China have contributed to an improvement in firm value (Yuan et al., 2008) and influenced firms' financial decisions using their voting rights (Firth et al., 2010). In this study, we examine the role of institutional investors in influencing one of a firm's major policy decisions, namely, cash dividend payouts.

According to agency theory, corporate insiders have incentives to divert a firm's resources to activities that benefit themselves but not the outside shareholders (Jensen, 1986). Higher cash dividends can reduce a firm's free cash flow under the insider's discretion and can force managers to seek external sources of funds to finance expansion plans, which expose them to market scrutiny. A question arises as to how a firm's directors can be induced to pay higher dividends when their natural inclination is to retain surplus cash. The outcome model of dividend policies, suggested by La Porta et al. (2000b), argues that minority shareholders can use their power to force companies to pay dividends.[1] However, whether small outside shareholders have enough "voice" to

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[1] La Porta et al. (2000b) use the outcome model and substitute model to explain differences in dividend policies around the world. We thank an anonymous referee for drawing our attention to the relevance of these models for our study. Both models are reviewed in Section 2.2.

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influence the decisions of firms is debatable as it is not easy to form coalitions of like-minded atomistic shareholders. This problem is exacerbated in countries where there is weak shareholder protection and strong information asymmetry. One way to overcome the problem is to have smart and active independent institutional investors who may be able to influence the decisions of directors, including those relating to dividends (Short et al., 2002; Smith, 1996; Woidtke, 2002).

The exact mechanics of how institutional investors can wield influence is unclear, especially when the investors do not have a seat on the board and when they face a controlling shareholder that dominates the board. Cheng et al. (2015) show that active institutional investors can communicate with management teams directly and exercise voting rights during shareholder meetings. Another important mechanism through which institutional investors can influence a firm's dividend payout is the threat of exit (Admati and Pfleiderer, 2009; Edmans, 2009; Edmans and Manso, 2011).[2] That is, active and independent institutional investors can *ex ante* govern managerial behaviors by the implicit threat of selling their shares. Here, the sale of a firm's shares by a sophisticated long-term investor may lead to a decline in the stock price, something that the directors of the firm want to avoid. In order to appease these institutional investors, the firm will listen to them and increase dividends when necessary (e.g., when the firm has surplus cash flow). The recent literature has concluded that institutional investors are effective monitors of listed firms in China.[3]

We argue that some institutional investors pose a larger exit threat than others. In China, we can usefully breakdown institutional investors into two main types. One type is independent of a firm's board and has no ties with the firm apart from that of being a non-controlling investor. The second type of institutional investor is one that has business ties with the firm. Examples of this type of investor are banks, insurance companies, and securities companies (hereafter, BIS). We argue that it is the former type of institution (e.g., a mutual fund) that has the greater exit threat. Mutual funds have the expertise to monitor and evaluate firms' managerial actions and a sell decision is only made after a careful and dispassionate consideration of a firm's prospects. Such exits are likely to lower the market's expectations of the firm and lead to lower stock prices. In contrast, BIS institutions have a less credible exit threat as their major motivation is to enjoy the benefits of the business association they have with the firm.[4] Exit is unlikely unless the business relation ends. Moreover, exits by BIS institutions probably signal the end of a business relationship rather than being a signal of firm overvaluation.

We further argue that the exit threat will be greater for independent institutions with a longer-term investment focus and that have larger investments. Some mutual funds have a short-term focus and have a high portfolio turnover rate. These funds may have increased turnover because of liquidity constraints (e.g., unit holders redeeming their units) or because they are trading on short-term sentiment and market rumors. Mutual funds with high portfolio turnover are expected to exit often but the valuation consequences of this are not serious (the stock market does not believe a sell decision by these investors convey much information about a firm's intrinsic value). Firms where mutual funds have a proportionately higher ownership stake are likely to face a higher cost from any exit. Exit decisions made by mutual funds with a large shareholding in a firm will carry more weight than mutual funds with a small shareholding. The exit threat also depends on the magnitude of price pressure that mutual funds' trading can exert. Such price pressure is expected to be stronger when a firm's free float of shares is low. In China, there is a coexistence of tradable and non-tradable shares in firms during the early years of our sample period. Here, the free float of shares is the tradable shares. The unique split share structure of Chinese firms allows us to examine how float influences the mutual funds' effect on corporate dividends. Our underlying thesis is that there will be a positive relation between the percentage stock ownership of proactive institutional investors and a firm's dividend payout. This is predicated on the existence of an exit threat by mutual funds that managers seek to counter by increasing dividends.

We examine the relation between institutional stock holdings and cash dividends in China during the period from 2003 to 2011. We distinguish between the effects of mutual funds and BIS, and expect that the former will have more effect on dividends than the latter. We find that mutual fund ownership is positively and significantly associated with a firm's dividend payout and the likelihood to pay dividends in the following year. In contrast, the total stock ownership of BIS is not associated with a firm's future dividend policy. The effects of mutual fund ownership on dividend payments are consistently positive and significant for SOEs. The significant and positive effects of mutual funds are also observed in firms with relatively higher free cash flows.

We further find that the effect of mutual funds on firms' dividend payouts is stronger in firms that had a low free float of shares (i.e., proportion of tradable shares) in earlier years and when mutual fund ownership is large and more stable (i.e., longer-term). A subsample analysis also shows that cash dividends increase in the year following large share purchases by mutual funds.

It is possible that mutual funds choose to invest in firms that already have high dividends. We examine the causal relationships using a number of tests. Our results show that changes in mutual fund ownership are positive and significant in explaining the future changes in dividends, but the changes in BIS ownership are insignificant. When regressing the changes in institutional ownership in year t against the changes in dividend payments in year $t-1$, we fail to find evidence of a positive relation in the reverse direction. Our results indicate that the causation runs from mutual funds to firms' dividends. To deal with the potential endogeneity problem arising from omitted (unobserved) firm-specific variables that simultaneously determine institutional ownership and dividends, we adopt firm-fixed effect regressions in our main analysis and the two-stage instrumental variable regressions in a robustness test. The results are consistent.

We also revisit the impact of institutional ownership on firm performance (Shleifer and Vishny, 1986; Admati et al., 1994). Consistent with Yuan et al. (2008), equity ownership by mutual funds has a positive effect on firm performance as measured by Tobin's Q and return on assets. In addition to what can be learned from the prior literature, our results show that the positive effects of mutual fund ownership on firms' return on assets are more significant for SOEs than for non-SOEs, and that BIS ownership does not seem to be associated with better firm performance.

Our research contributes to the literature by examining the effects of minority blockholders on firms' dividend payouts. We find that mutual funds, the most proactive type of minority shareholders, increase firms' dividend payouts. Our study also contributes to the literature on the monitoring effects of mutual

[2] Edmans et al. (2013) and Bharath et al. (2013) provide some empirical analysis, and Edmans (2014) provides a review. We thank an anonymous referee for suggesting this line of inquiry.

[3] See for example, Aggarwal et al. (2014), Wu et al. (2015), and Yao and Liu (2009), among others.

[4] According to Chen et al. (2007) and Ferreira and Matos (2008), among others, not all institutional investors act as independent institutions whose only consideration is the value maximization of the shares they own. The "grey" institutions, such as banks, insurance companies, and securities companies, so-called because of their potential business ties with the listed firms that they have invested in, may have incentives to maximize the benefits from their business dealings rather than maximize the listed firm's value.

funds versus those of "grey" institutions (Chen et al., 2007; Ferreira and Matos, 2008; Aggarwal et al., 2011; Aggarwal et al., 2014).

To the best of our knowledge, this is the first study focusing on the effects of institutional ownership on dividend policy in China. Prior studies have considered the effects of the controlling shareholders (i.e., SOE versus non-SOEs) and the coexistence of non-tradable and tradable shares in a firm on dividends, but they have not touched on the roles played by minority shareholders. Cross-country analyses on the monitoring roles of institutional investors (Ferreira and Matos, 2008; Aggarwal et al., 2011) do not cover China. Given the fast-growing importance of financial markets in China to international investors, the incentives and abilities of institutional investors to monitor firms can no longer be ignored or simply extrapolated from studies in western countries. Arguably, institutional investors in China will have a more important role in monitoring firms than do their counterparts in the developed countries because of government ownership of shares, weak enforcement of private property rights, disdain for the rights of minority shareholders, and the relatively inexperienced individual investors. Our conclusions should have resonance in other transitional and emerging financial markets that are grappling with ways to improve efficiency and governance.

The remainder of the paper proceeds as follows. Section 2 reviews the relevant literature, introduces institutional background, and develops our hypotheses. Section 3 describes the data sample and variables. Section 4 presents our main results about the relation between institutional ownership and dividend policy. Section 5 revisits the effects of institutional ownership on firm performance. Section 6 discusses robustness tests and Section 7 concludes.

2. Literature review, institutional background, and hypothesis

2.1. Institutional background in China

The stock markets in China have gone through dramatic changes during the past two decades. The percentage of listed firms that pay dividends to their stockholders increased from 48.39% in 2003 to 67.27% in 2011,[5] as shown in Fig. 1. The average dollar amount of cash dividends per firm has grown from 94 million Chinese Yuan (CNY) in 2003 to 196 million CNY in 2011. The cross-sectional average of annual cash dividend per firm scaled by book value of assets remained stable over time and was 2.3% in 2003 and 2.0% in 2011.

Most Chinese listed firms have a dominant controlling shareholder that leaves little room for individual investors to have a direct influence on corporate decisions. The controlling shareholders are either the Chinese government, which is represented by government agencies, state asset holding/management companies, and state-owned enterprises, or private/family entities (Chen et al., 2009b). Based on government directives, the state, as the ultimate controlling shareholder of many firms, tends to press for more cash dividends in order to reduce the free cash flows under the managers' discretion.[6] In contrast, the non-state (privately) controlled firms are subject to less political pressure and are more capital-constrained in obtaining external equity and long-term debt than state-controlled firms. These firms rely more on internal financing, which implies lower dividend payouts. Consistent with these arguments, Bradford et al. (2013) and Wang et al. (2011) find that dividend payouts increase with state ownership.

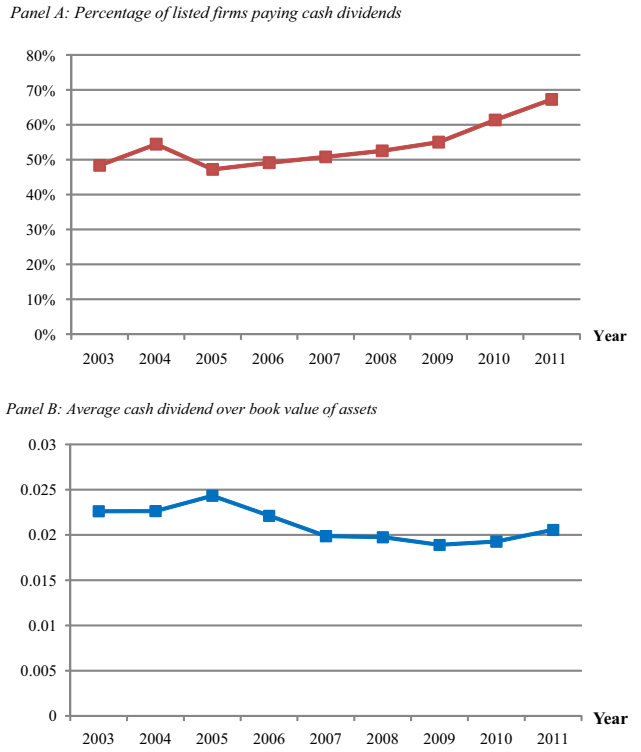

Fig. 1. Cash dividend payments of listed firms in China. Panel A plots the annual number of listed firms that pay a cash dividend over the total number of listed firms on the SHSE and SZSE from 2003 to 2011. Panel B plots the cross-sectional average of cash dividend over book value of assets in each year from 2003 to 2011.

Before 2005, approximately 65% of a firm's equity was in the form of non-tradable shares held by the government, its affiliated bodies, and legal persons in China.[7] The non-tradable shareholders, who include the controlling shareholder, prefer higher dividend payouts, because they were not allowed to trade their shares freely in the secondary market and dividends represent the only cash flow that they could expect from the listed firms. Huang et al. (2011) show that dividend payouts are positively associated with the proportion of non-tradable shares, provided that the firm has sufficient profitability and dividend-paying capacity.

The prior literature investigates how the ownership and composition of controlling shareholders influence firms' dividend policies in China, but it simplifies or ignores the effects of the non-controlling (i.e., minority) shareholders. For example, Huang et al. (2011) and Wang et al. (2011) assume that minority shareholders in China, including institutional and individual investors, prefer not to receive cash dividends because capital gains are tax free while dividends are subject to tax. However, this is an over-simplification because, given the agency conflicts between corporate insiders and outsiders, more earnings retained in the firm might not lead to higher future capital gains. A high dividend payment can reduce the minority shareholders' fear of future expropriations conducted by the controlling shareholders or managers. La Porta et al. (2000b, p. 4) points out that, in a world of significant agency problems, "dividends (a bird in the hand) are better than retained earnings (a bird in the bush) because the latter might

[5] By a way of comparison, the percentage of sample firms paying cash dividends in 22 countries worldwide is 75% in the period from 2003 to 2007 (Aggarwal et al., 2011).

[6] Since the mid-1990s, the financial regulators in China have adopted various strategies to urge listed firms to distribute cash dividends with the ultimate objective of reducing agency costs. The regulators have more influence on state-controlled firms.

[7] The China Securities Regulatory Commission launched the split share structure reform in 2005, transforming non-tradable shares to tradable shares (Firth et al., 2010). By the end of 2007, almost all firms had completed the reform. After the reform, the formerly non-tradable shares were subject to staggered lock-up periods that could last several years. Many government agencies have strong incentives to maintain their control over listed firms and therefore tend not to sell their shares.

never materialize as future dividends (can fly away)." Lee and Xiao (2007) and Chen et al. (2009a) argue that dividends are a way for controlling shareholders to tunnel resources away from minority shareholders. However, there are many, and often subtle, ways that controlling shareholders can extract private benefits that come at a cost to minority shareholders. Paying out a cash dividend is not an ideal choice for controlling shareholders because the dividend is shared with minority shareholders. As shown by Huang et al. (2011), conventional factors, especially profitability, are still the main determinants of dividend payouts in China.

The overall immature regulatory and legal mechanisms, and inadequate disclosure of financial information in China, make it hard for individual shareholders to directly monitor managers and controlling shareholders. Institutional investors, who pool the investments of various individuals, become a potentially important vehicle to help strengthen the bargaining power of minority shareholders in the corporate governance process. In light of this, the China Securities Regulatory Commission (hereafter CSRC) has made substantial regulatory efforts since 2000 to encourage the development of financial institutions. At the forefront of these efforts was the development of an active mutual fund industry. Thus, it is no surprise that securities mutual funds have grown rapidly. At the end of 2011, there were 66 fund management companies managing 1019 mutual funds. The total market value of equity held by mutual funds has increased over time and amounted to more than 1.04 trillion CNY at the end of 2011. During our sample period, the average mutual fund ownership in a firm is 5.6% with a maximum of 66.5%.[8] This is a significant percentage given that the major stockholder, be it the government or a private individual, owns about 40% of the outstanding shares, and thus, the effective free float of shares (from which the mutual funds can buy) is often less than 60%. All this evidence suggests that mutual funds have the potential to exercise influence on listed firms.

The securities mutual fund industry in China is largely organized along the lines of those in the U.S. and other developed countries. Management fees depend on performance, measured by capital gains and dividends of their investments, and fund size.[9] The emphasis on stock return performance and extensive competition puts intense pressure on mutual fund managers to make profitable investment decisions for the funds' unit holders. Yuan et al. (2008) report that mutual fund ownership is positively associated with improved firm performance. Although mutual funds do not have a direct input into a firm's management decisions (e.g., dividends, capital investment) as they are not represented on the board of directors, they nevertheless have ways to exert influence through both direct means and more subtle means. Mutual funds can quiz top executives on corporate strategies and operations and can convey their views on the firms through attendance and voting at the annual general meetings of the firm and during conference calls and site visits to the firm (Cheng et al., 2015), and through other forms of communication. More subtle means of influence include the threat of exit. If mutual funds sell shares in a listed firm, this will have negative connotations for the firm's stock price. Here, the mutual fund is perceived by the stock market as being an expert investor that will only sell shares if they believe the firm is overvalued and has poor long-term prospects. The firm will try to appease the mutual funds by listening to their advice and increasing dividend payouts.

The other financial institutions in China, such as commercial banks, insurance companies, and securities companies possess different characteristics from mutual funds and are considered to have limited monitoring abilities. The securities companies are the second largest type of financial institution in the stock markets but they normally have close business ties with listed firms in their capacity of being the underwriters of share issues and/or providing other financial advice and services. Therefore, to protect their business relations, securities companies are less willing to challenge management decisions (Cornett et al., 2007) and are therefore more passive and less-effective in monitoring (Yuan et al., 2009). Other financial institutions carry less of an exit threat. Similar to securities companies, banks and insurance companies also have various business relations with listed firms. Moreover, the equity ownerships of these financial institutions are limited.[10] According to the Commercial Bank Law of the People's Republic of China (2003, Article 43), banks are forbidden to hold firms' shares directly or to actively manage those investments. Therefore, commercial banks only hold a firm's shares passively, for example, if the shares are collateral for company loans. Insurance companies are subject to strict quotas for stock investment.

Fig. 2 shows the annual equity ownership of mutual funds and BIS from 2003 to 2011. The total investments of BIS are always dwarfed by those of mutual funds throughout the sample period. In Panel A, we show that the percentage ownership of mutual funds peaked at 9.46% in 2007 and declined to 5.36% in 2011. The sharp fall in the stock market (the market fell more than 60% from the peak in 2007 to the end of 2011) resulted in investors redeeming their mutual fund units and exiting the market. In Panel B, we show the number of firms with institutional investor ownership as a percentage of the total number of firms listed on the Shanghai and Shenzhen Stock Exchanges (hereafter SHSE and SZSE) in each year. At the end of 2011, about 90% of listed firms have some of their stocks owned by mutual funds.

2.2. Literature review and hypothesis

The monitoring effects of institutional stock ownership on corporate governance have been studied extensively for many years. One strand of the literature focuses on the effects of institutional shareholders on firm performance. Smith (1996) argues that a high level of institutional ownership leads to shareholder activism, which, in turn, can increase shareholders' wealth. In the U.S., Woidtke (2002) finds a positive relation between a firm's Tobin's Q and the share ownership of private pension funds. Chen et al. (2007) conclude that only concentrated shareholdings by long-term independent institutions can increase a firm's market return and return on assets. According to the cross-country analysis by Ferreira and Matos (2008), firms with higher stock ownership held by foreign and independent institutions, including mutual funds, have higher firm valuations. Utilizing a unique natural experimental setting during the Swedish pension fund reform, Giannetti and Laeven (2009) find that firm value increases with the increased shareholding of public and large private pension funds.

Another strand of the recent literature investigates the influences of institutional investors on firms' specific corporate governance decisions. Aggarwal et al. (2011) find that a change in institutional ownership over time leads to subsequent positive changes in firm-level governance in 23 countries. Specifically, when the ownership of foreign institutions is high, a firm's board tends to have an appropriate size and a majority of independent directors, and is more likely to adopt non-staggered board provisions and fire poorly performing CEOs. Furthermore, institutional investors are found to influence a firm's executive compensation

[8] This number (66.5%) is the mutual fund ownership of Zhongbai Group (stock code: 000759) in year 2008, whose largest ten shareholders include nine mutual funds investors.

[9] For open-end funds, investors (i.e., unit holders) can choose to withdraw at any time.

[10] The average percentage equity ownership per year of banks and insurance companies are 0.2% and 1.8%, respectively, over the years 2003–2011.

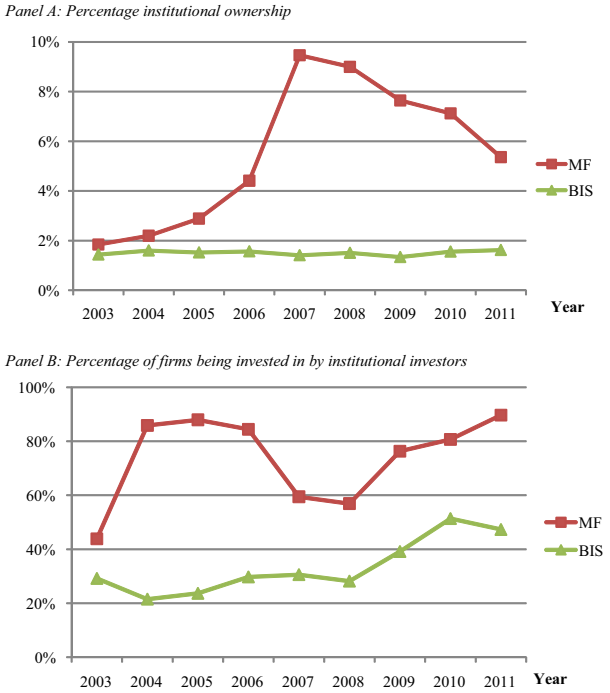

Fig. 2. Institutional ownership in China. Panel A shows the annual percentage stock ownership of listed firms by institutional investors from 2003 to 2011. Panel B shows the annual number of firms with institutional stock ownership over the total number of firms listed on the SHSE and SZSE. MF refers to domestic mutual funds and QFII. BIS refers to other institutional investors including banks, insurance companies, and securities companies.

structure (Croci et al., 2012) and CEO turnover decisions (Helwege et al., 2012).

Recent literature also shows that mutual funds are able to monitor listed firms in China. In the interviews conducted by Yuan et al. (2009), senior managers of financial institutions and board directors of listed firms in China confirm that many mutual funds exercise influence on corporate management, while other institutions such as securities companies are passive shareholders. Board directors of firms also consider mutual funds' participation in corporate governance to be positive. In other studies, institutional investors are found to actively control the insiders' expropriations (Chen et al., 2006; Yao and Liu, 2009) and help reduce the incidence of corporate fraud (Aggarwal et al., 2014; Wu et al., 2015) in China.

Corporate insiders, including managers and controlling shareholders, may divert a firm's profits for perquisite consumption, empire building, and other value-destroying activities (Myers, 2000; Gomes, 1999; La Porta et al., 2000a). Large payouts to shareholders reduce free cash flows under insiders' control and may force firms to raise external funds and be monitored by the capital market. Recently, La Porta et al. (2000b) enunciated two models to explain dividend policies, which they labeled the outcome model and the substitute model. The outcome model argues that minority shareholders can use their power to remove directors to force companies to disgorge cash and pay dividends. In contrast, under the substitute model, firms need to establish a good reputation for future external fund raising, and so corporate insiders tend to pay dividends and reduce the earnings that could be left for expropriation. In a similar vein of thought, Cheffins (2006) argues that the implicit commitment to pay dividends imposes discipline on public companies and this aided the separation of control and ownership in British firms in the 20th century despite the fact that there were relatively few explicit laws in place at the time to protect minority shareholders. He contends that dividends placate or reassure investors and make them more willing to buy shares in the company. Bøhren et al. (2012) find that the dividend policies of Norwegian banks that have very unique stakeholder features support the substitute theory. Specifically, banks controlled by non-owner stakeholders (the employees, customers, and community citizens) payout significantly more dividends than banks controlled by the owners. Although the substitute model and outcome model suggest different preferences of corporate insiders over dividends, they both argue that dividend payouts reduce potential agency costs and are beneficial for minority shareholders. Institutional investors may represent the interests of minority shareholders and influence firms' dividend policies.

Eckbo and Verma (1994) find that the magnitude of cash dividends increases with the voting power of institutional shareholders in Canada. This finding is consistent with the monitoring hypothesis of institutional investors. For U.S. firms, Grinstein and Michaely (2005) show that institutional investors avoid firms that pay no dividends, but prefer low dividends among dividend-paying firms. In contrast, Short et al. (2002) report a positive and contemporary association between dividend payout and institutional ownership for firms in the U.K.

Outcome theory suggests that firm owners prefer a higher dividend payout to reduce the free cash flows that fall under the insiders' discretion. According to the substitute theory, in countries with poor investor protection and concentrated share ownership, firm insiders prefer issuing more dividends to establish good reputations ahead of future external fund raising. Under both theories, paying dividends helps reduce the potential agency conflicts between firm insiders and outsiders and thus benefits minority shareholders. Motivated by the monitoring hypothesis (Admati et al., 1994) and exit threat theory (Admati and Pfleiderer, 2009; Edmans, 2009), we examine the degree to which the equity ownership of institutional investors, the most influential type of minority shareholders, affects dividend payments in China. As mutual funds and BIS have different characteristics and incentives, we expect the former to be more independent and proactive than the later. Specifically, we hypothesize that:

H1. Mutual fund ownership is positively related to dividend payments while BIS ownership has no predictive power to explain dividend payments.

3. Data and variables

3.1. Sample selection

To test our hypothesis, we use data from firms listed on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) for the period from 2003 to 2011. The Wind Data System (WDS) provides annual data on institutional stock ownership from 2003 onward. Dividend, other financial data and ownership information, including the number of tradable and non-tradable shares of firms, are obtained from the China Stock Market Accounting Research (CSMAR) database. We exclude firms in the financial sector (e.g., banks, securities companies, insurance companies, and investment trusts), because they are heavily regulated and their financial ratios are not comparable with other industry sectors, and firms that have been listed for less than one year. After dropping observations with missing values, there are 13,105 firm-year observations remaining in our sample. The total number of sample firms varies from a minimum of 1172 in 2003 to a maximum of 1968 in 2011.

Table 1
Descriptive statistics.

Panel A: Descriptive statistics of variables

Variables	*N*	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
MF	9816#	0.056	0.084	<0.001	0.002	0.018	0.076	0.665
BIS	4552#	0.015	0.025	<0.001	0.004	0.009	0.019	0.584
DIV	6934#	0.021	0.021	<0.001	0.007	0.014	0.026	0.262
DIVDM	13,105	0.529	0.499	0	0	1	1	1
FCF	13,105	0.047	0.084	−0.220	0.003	0.047	0.094	0.280
GROWTH	13,105	0.246	0.628	−0.786	0.001	0.156	0.342	4.593
STATE	13,105	0.216	0.246	0	0	0.078	0.433	0.971
HERF10	13,105	0.085	0.110	0	0.002	0.046	0.127	0.563
SOE	13,105	0.599	0.490	0	0	1	1	1
MAO	13,105	0.017	0.067	0	0	<0.001	<0.001	0.436
MB	13,105	1.709	1.127	0.794	1.058	1.307	1.890	7.613
SIZE	13,105	21.494	1.182	18.744	20.700	21.377	22.156	25.121
LEVE	13,105	0.523	0.276	0.059	0.358	0.512	0.647	2.050
ROA	13,105	0.026	0.082	−0.432	0.010	0.032	0.060	0.211
VOL	13,105	0.032	0.029	<0.001	0.024	0.029	0.036	1.636

Panel B: Key variables in subsamples

Variables		SOEs	Non-SOEs	Row T-TEST	ALL
DIV	Firms with dividend	0.020	0.022	−3.61***	0.021
	Firms without dividend	0	0		0
	ALL	0.011	0.011	−0.17	0.011
MF	Firms with dividend	0.062	0.066	−1.51	0.063
	Firms without dividend	0.018	0.018	−0.21	0.018
	Column T-TEST	28.08***	23.65***		36.71***
	ALL	0.042	0.042	0.31	0.042
BIS	Firms with dividend	0.006	0.007	−1.04	0.006
	Firms without dividend	0.004	0.003	3.15***	0.004
	Column T-TEST	4.35***	11.39***		9.11***
	ALL	0.005	0.005	2.19**	0.005
N	Firms with dividend	4310	2624		6934
	Firms without dividend	3536	2635		6171
	ALL	7846	5259		13,105

The table shows the descriptive statistics of firm-year observations of variables for the period from 2003 to 2011. MF and BIS are the numbers of shares, respectively, held by mutual funds and BIS institutions, over a firm's total number of shares outstanding. DIV is cash dividend over book value of assets. DIVDM is a dummy variable, which equals one if a firm pays cash dividends (DIV > 0) in a year and zero otherwise. FCF is the net operating cash flow less net capital spending over total assets. GROWTH is the annual percentage change in sales. STATE is number of state-owned shares over the total number of shares outstanding. HERF10 is the sum of the squared percentage shares held by the ten largest non-state shareholders. SOE is a dummy variable that equals one if a firm's ultimate controlling shareholder is the government or government agency, and zero otherwise. MAO is the percentage shares owned by senior managers of a firm. MB is the market to book ratio. SIZE is the natural logarithm of total assets. LEVE is total liabilities over assets. ROA is net profit over total assets. VOL is the standard deviation of a firm's daily stock returns during a year. Panel A shows the descriptive statistics, where # refers to the number of non-zero observations. For MF, BIS, and DIV, summary statistics are reported for the sample of firm-year observations with positive values, whereas in the regressions, firm-year observations without positive values are set to zero. Panel B shows the mean values of DIV, MF, and BIS subsamples, divided along two dimensions: SOEs versus non-SOEs and dividend-paying versus non-dividend-paying observations. The null hypothesis that the difference in subsample means is zero is tested via a two-tailed t-test. The t-statistics of SOEs versus non-SOEs are reported in the rows and those of dividend-paying versus non-dividend-paying are in the columns. *N* refers to number of observations before we take lagged values of independent variables. *, **, *** in Panel B indicate the 10%, 5%, and 1% significance levels, respectively.

3.2. Variables

To measure the amount of dividend payment, we use the annual cash dividend per share over the book value of assets per share (DIV) of a firm, following the definition used by Grinstein and Michaely (2005) and Li and Zhao (2008), among others.[11] To account for the firm's decision to pay cash dividends, as in Li and Zhao (2008) and Booth and Chang (2011), we use a dividend-paying dummy variable, denoted by DIVDM, which is equal to one if a firm makes one or more cash dividend payments in a year and otherwise is coded zero. In a robustness test, DIV is replaced by cash dividend per share as the dependent variable, following Short et al. (2002). The results are similar.

WDS provides stock ownership data of various institutions at the end of each calendar year. We consider mutual funds, including domestic mutual funds and qualified foreign institutional investors (hereafter QFII), and other institutions, separately.[12] The percentage ownership of mutual funds (MF) is measured as the number of a firm's common shares held by mutual funds and QFII divided by the firm's total number of shares in issue. Other institutions consist of banks, insurance companies, and securities companies. Their ownership (BIS) is measured by the number of common shares held by these institutions over the firm's number of shares in issue.[13]

We include firm-specific control variables in our regressions. We measure the free cash flow (FCF) of a firm as the ratio of net operating cash flows adjusted by net capital expenditure over total assets (Fenn and Liang, 2001; Huang et al., 2011). FCF is the cash

[11] To capture dividend policy, we scale cash dividends by assets rather than earnings because in our sample, some firms pay dividends in years with negative earnings. Negative dividend payouts are difficult to interpret using regression analysis. We conduct a robustness test by excluding the firm-year observations with negative earnings and using the ratio of dividend over earnings as the dependent variable in our regressions. The conclusions about the positive effects of mutual funds' ownership on dividend payouts are not altered.

[12] Since 2003, certain foreign institutional investors have been permitted to trade A-shares in Chinese stock markets. During our sample period, the total investment amount of QFII was small. We include QFII in the mutual fund group in our tests because they are more independent than domestic BIS institutions. All of our results are consistent if the QFII investments are excluded from the group of mutual funds.

[13] Following Yuan et al. (2008), we also estimate the ownership of institutional investors (either mutual funds or BIS) using the market value of their share ownership divided by the firm's market value. The results are consistent. The correlation coefficient between the market value-based ownership of mutual funds and MF is 91.7% and it is 94.6% for BIS. The regression results using market values of institutional investors are available from the authors on request.

flow available to spend at the managers' discretion. If cash dividends are used to reduce agency costs, we expect dividend payments to be positively related with FCF. We use the previous year's sales growth (GROWTH) and market-to-book ratio (MB) to control for the expected sales growth and expected investment opportunities. The pecking order theory suggests that higher growth or abundant investment opportunities induce lower cash dividends as earnings are retained to finance the growth. However, according to the substitute theory, firms with better growth prospects want to establish a good reputation in the eyes of capital providers through paying out more cash dividends. Therefore, the effects of GROWTH and MB on dividend policy are ambiguous. Leverage (LEVE) is measured as total liabilities over assets. As both debt and dividends might be used to reduce cash flows, they could be substitutes in resolving agency problems. Thus, we expect a negative sign on LEVE. We expect a positive relation between dividend and return on assets (ROA), because dividends are paid out of current profits and retained earnings.

We use the proportion of state ownership (STATE) and firms where the ultimate controlling shareholder is the government to measure the state's effect on dividends following the measures used in Bradford et al. (2013) and Wang et al. (2011). SOE is a dummy variable, which is coded one if a firm's ultimate controlling shareholder is the government or government agency and zero otherwise. The expected signs on STATE and SOE are indeterminate. On the one hand, the government has encouraged firms to pay dividends and the government has most influence on SOEs. The firms owned by private entities might not want to pay dividends because they are more capital constrained in obtaining external long-term debt and equity. On the other hand, SOEs have a variety of objectives to satisfy and they may have a lower capacity to pay dividends. We also control for ownership concentration (HERF10), which is the sum of the squared percentage of shares owned by the ten largest non-state shareholders following the definition in Aggarwal et al. (2014). A higher share ownership concentration of large shareholders could enable them to better monitor management and improve firm performance (Shleifer and Vishny, 1986; Yuan et al., 2009). We expect HERF10 to have a positive relation with dividend policy. Management stock ownership (MAO) is measured by the percentage of shares owned by management. Management may desire dividend income if they feel restricted in selling their shares in the company. On the other hand, top management may be more desirous of capital gains if they believe (through hubris or otherwise) that the firm has strong growth potential. In additional analysis, we use the proportion of tradable shares of a firm (TS) during the years before split share reform (pre-2005) to measure the free float of shares in the stock market. After the reform, we use proportion of tradable shares minus proportion of state ownership to measure float.

We also include firm size (SIZE) to control for size effects and stock return volatility (VOL) as a proxy of uncertainty that might have a negative effect on dividend payouts. Industry classification is based on the two-digit industry codes provided by the CSMAR database. To obtain the industry adjusted ROA (Adj.ROA) and Tobin's Q (Adj.Q), we compute the median values of respective variables across all firms within each industry sector in a year. Adj.ROA (and Adj.Q) is calculated as the difference between a firm's ROA (and Q) and the industry median. Variables defined as ratios are winsorized at the upper and lower 1% levels. Appendix 1 gives a detailed description of all variables.

3.3. Descriptive statistics

Panel A of Table 1 presents the descriptive statistics of the variables used in our main analysis. The average MF and BIS are, respectively, 5.6% and 1.5% during the sample period. The equity holdings of mutual funds exceed those of BIS for most firms. Among 13,105 firm-year observations, 52.9% (or 6934 observations) have cash dividend payments, and the average DIV is 0.021.

In Panel B of Table 1, we partition the sample across two dimensions: SOEs versus non-SOEs and dividend-paying versus non-dividend-paying observations. The mean and standard deviation of DIV, MF, and BIS of each subsample are presented. The proportion of SOEs with cash dividend payments (4310 observations or 55%) is higher than that of non-SOEs (2624 observations or 50%). However, the average DIV is significantly lower for SOEs than for non-SOEs. There is no significant difference in the average mutual fund ownership of SOEs and non-SOEs. The average MF for dividend-paying firms (0.063), is significantly higher than for non-dividend-paying firms (0.018). This finding is consistent with our hypothesis that mutual fund ownership is positively related to dividend payments. The results are similar for BIS institutions except that, when there is no dividend, BIS ownership is higher in SOEs than in non-SOEs. The Pearson correlation coefficients reported in Table 2 show that the measures of institutional ownership (MF and BIS) are all significantly and positively related to dividend payments (DIV and DIVDM).[14]

4. Regression analysis of the effects of institutional ownership on firms' cash dividend policies

4.1. Panel regression model

In this section, we test whether institutional ownership can influence firms' dividend payouts using the methodologies in Desai and Jin (2011), Aggarwal et al. (2011), and Aggarwal et al. (2014). We investigate the effects of the explanatory variables on the future dividend payments, by regressing the measures of dividend policy on the one-year-lag values of institutional ownership and other explanatory variables. We use firm-fixed effect models to control for the possible endogeneity arising from unobserved firm-level, time-invariant factors that simultaneously determine both institutional ownership and dividend policy.

Specifically, for the dividend policy of firm i in year t, measured by either $DIV_{i,t}$ or $DIVDM_{i,t}$, the regression model is as follows:

$$DIV_{i,t}(DIVDM_{i,t}) = \alpha_{1,i} + \alpha_2 MF_{i,t-1}(BIS_{i,t-1}) + \alpha_3 Control_{i,t-1} + Dummy(year) + \varepsilon_{i,t} \quad (1)$$

where $MF_{i,t-1}$ and $BIS_{i,t-1}$ are, respectively, the equity ownership of mutual funds and BIS institutions in firm i in year $t-1$. Firm-specific control variables in year t-1 include FCF, GROWTH, STATE, HERF10, SOE, MAO, MB, SIZE, LEVE, ROA, and VOL that are discussed and defined in the previous section. Year dummies are added to capture possible year-specific effects. We use heteroskedasticity-consistent standard errors clustered at the firm level.

4.2. Regression results

Table 3 presents the regression results of Eq. (1) for H1. With dividend payout (DIV) as the dependent variable, column (1) uses mutual fund ownership (MF) as the explanatory variable of

[14] To test the contemporary determinants of firms' dividend policies, we regress DIV in year t against MF, BIS, and other control variables in year t and the lagged DIV. When both MF and BIS are included in the same regression to explain DIV in the same year, the estimated coefficient on MF is significantly positive, while the coefficient on BIS is insignificant. Consistent with the findings of Huang et al. (2011), the estimated coefficients on MB and LEVE are negative and significant, the coefficient on SIZE is positive and significant, and the coefficient on SOE is insignificant. Similar results are obtained when we use a Probit regression model with DIVDM as the dependent variable, and change the methodology to Fama–MacBeth (Fama and MacBeth, 1973) regression with Newey and West (1987) t-statistics.

Table 2
Correlation analysis.

Variable	DIV	DIVDM	MF	BIS	FCF	GROWTH	STATE	HERF10	SOE	MAO	MB	SIZE	LEVE	ROA
DIVDM	55.7***													
MF	25.1***	29.7***												
BIS	5.4***	8.0***	15.0***											
FCF	29.0***	18.1***	18.9***	2.8***										
GROWTH	3.5***	6.1***	6.2***	1.2	7.4***									
STATE	8.3***	6.5***	-8.1***	−3.7***	9.6***	3.5***								
HERF10	7.9***	9.2***	0.1	2.9***	−2.4***	5.1***	−15.1***							
SOE	0.2	4.9***	0.3	1.8**	7.9***	−1.2	54.2***	−34.9***						
MAO	13.1***	13.0***	4.8***	0.4	−5.2***	1.5*	−20.2***	13.1***	−28.2***					
MB	8.1***	7.7***	22.3***	4.5***	7.0***	−0.7	−27.9***	6.8***	−17.3***	4.8***				
SIZE	11.2***	32.9***	28.0***	9.6***	8.3***	8.5***	13.7***	6.5***	28.6***	−11.4***	−32.9***			
LEVE	−33.3***	−27.6***	−8.5***	−3.7***	−15.7***	0.6	−02.4***	−5.4***	1.8**	−19.2***	3.6***	1.7*		
ROA	40.6***	40.6***	29.1***	8.0***	29.7***	21.4***	1.2	9.3***	0.2	11.1***	8.4***	21.5***	−46.4***	
VOL	−4.8***	−6.5***	−0.2	−2.3***	−0.2	15.4***	−2.0**	3.2***	−3.8***	0.2	7.0***	−5.8***	02.2**	1.9**

The table presents Pearson correlations. Variables are defined in Appendix 1. *, **, and *** respectively indicate the 10%, 5%, and 1% significance levels. All numbers are in percentage.

interest, column (2) uses BIS ownership (BIS), and column (3) includes both MF and BIS in the same regression. The relation between mutual fund ownership and dividend payout is consistently positive and significant at the 1% level, while the estimated coefficients on BIS are always insignificant.[15] A Wald test rejects the null hypothesis that the MF and BIS coefficients are equal in column (3). The positive effect of MF on DIV is both statistically and economically significant. In column (3), a one standard deviation increase in MF increases DIV by 9.67% in the following year.[16]

Since the institutional investors are expected to influence not only the amount of dividend payments but also the firms' decisions to pay dividends, we use the dividend-paying dummy, DIVDM, as an alternative dependent variable. The results are presented in columns (5)–(7) of Table 3. Mutual fund ownership is significantly positive in explaining DIVDM, while BIS is not statistically significant. A Wald test rejects the equality of MF and BIS coefficients in column (7). Therefore, mutual funds, unlike other institutional investors, can increase the likelihood of firms paying cash dividends.

Table 3 shows that the estimated coefficients on FCF and ROA are positive and statistically significant for both the DIV and the DIVDM dependent variables. This evidence is consistent with dividends being used to disgorge free cash flows and reduce potential agency costs. The coefficients on ROA show that more profitable firms pay higher dividends. The negative coefficients on LEVE are consistent with our prediction. It reinforces the conclusions of Jensen (1986), that leverage is a substitute for cash dividend in reducing agency costs. The growth opportunities (GROWTH and MB) are positively related to future dividend payments but are more significant in explaining DIV than DIVDM. As expected, VOL is negatively related to dividend payments.

The estimated coefficients on STATE are positive and significant in explaining DIVDM, while the SOE dummy is insignificant. Similar results are also obtained by Huang et al. (2011) for an earlier sample period. We explore whether the state ownership of firms can reinforce or offset mutual funds' effects on dividend policies. To do so, we add an interaction term of MF × STATE as an explanatory variable to Eq. (1).[17] The results are shown in columns (4) and (8) in Table 3, respectively, for DIV and DIVDM. The estimated coefficients on MF × STATE are positive and significant in both columns and those on MF remain significant. Our results indicate that the state ownership in China has a positive effect on firms' decisions to pay dividends and can reinforce the mutual funds' influence on firms' dividend policies.

4.3. Mutual funds' effects in SOEs versus non-SOEs and the influence of agency costs

As discussed in previous sections, many firms in China are directly or indirectly owned by the government. The SOEs are considered to have more complicated agency problems than is the case for non-SOEs because conflicts of interests arise between managers and shareholders, and between the state controlling shareholders and minority shareholders. We argue that mutual funds are more incentivized to monitor SOEs than non-SOEs. Therefore, we estimate the regression model of Eq. (1) separately for the SOEs and non-SOEs and expect that the influences of mutual funds are more pronounced in the former than in the later. In Table 4, columns (1) and (2), we present the results with DIV as the dependent variable.[18]

We find that the estimated coefficient on MF is positively significant for SOEs in column (1), but it is insignificant for non-SOEs in column (2). The absolute value of the estimated coefficient on MF (0.018) for SOEs is higher than the corresponding figure for the whole sample (0.014, in column (3) of Table 3).[19] Based on the results in column (1), a one standard deviation increase in MF will cause the dividend payout of an SOE to increase by 12.76%.[20] The estimated coefficient on BIS ownership is insignificant in both columns. We find similar results when DIVDM is the dependent variable, where the estimated coefficient on MF is positive and significant at the 1% level for SOEs and at the 10% level for non-SOEs. This finding demonstrates that mutual funds' positive effects on dividend policy are stronger and more consistent for firms that are ultimately controlled by the government than those controlled

[15] In Table 3, the Chow test rejects the null hypothesis that the coefficient on MF in column (1) is the same as the coefficient on BIS in column (2).

[16] We obtain this estimate by multiplying the estimated coefficient on MF (0.014) by one standard deviation of MF (0.076), divided by the average DIV (0.011). The standard deviation of MF and the mean of DIV are different from those reported in Table 1 because they are calculated over the number of observations used in the regression (i.e., 11,059).

[17] We also conduct a test by adding the interaction term of BIS × STATE to Eq. (1). The estimated coefficients on BIS and BIS × STATE are statistically insignificant at conventional levels.

[18] As suggested by the anonymous referee, we only present the regression results with DIV as the dependent variable in the following sections. The results with DIVDM as the dependent variable are similar and are available from the authors upon requests.

[19] The Chow test is used to compare the coefficients on the same variable in two different regressions and the test result indicates a significant difference between them.

[20] The estimate is obtained by multiplying the estimated coefficient (0.018) by one standard deviation of MF (0.078), divided by the average DIV (0.011).

Table 3
Effects of institutional ownership on dividend policy.

	Dependent variables							
	DIV				DIVDM			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MF	0.014***		0.014***	0.006**	0.401***		0.400***	0.254**
	(3.72)		(3.70)	(2.14)	(4.89)		(4.87)	(2.07)
MF × STATE				0.043***				0.859***
				(2.86)				(3.04)
BIS		0.007	0.006			0.306	0.279	
		(0.32)	(0.29)			(0.81)	(0.80)	
FCF	0.010***	0.010***	0.010***	0.010***	0.113**	0.128**	0.114**	0.114**
	(5.66)	(5.84)	(5.66)	(5.71)	(2.27)	(2.56)	(2.27)	(2.28)
GROWTH	0.001***	0.001***	0.001***	0.001***	0.009	0.009	0.009	0.009
	(2.86)	(2.71)	(2.86)	(2.60)	(1.64)	(1.49)	(1.63)	(1.59)
STATE	0.003*	0.002	0.003*	0.001	0.171***	0.162***	0.171***	0.162***
	(1.67)	(1.44)	(1.67)	(0.69)	(4.34)	(4.10)	(4.34)	(4.04)
HERF10	0.001	0.000	0.001	0.001	0.308***	0.284***	0.306***	0.308***
	(0.34)	(0.07)	(0.33)	(0.37)	(3.96)	(3.65)	(3.93)	(3.96)
SOE	−0.001	−0.001	−0.001	−0.001	−0.013	−0.013	−0.013	−0.013
	(−1.34)	(−1.34)	(−1.34)	(−1.34)	(−0.63)	(−0.63)	(−0.62)	(−0.63)
MAO	−0.003	−0.003	−0.003	−0.003	0.354	0.355	0.353	0.353
	(−0.25)	(−0.24)	(−0.25)	(−0.26)	(1.41)	(1.42)	(1.41)	(1.41)
MB	0.001***	0.001***	0.001***	0.001***	0.005	0.013**	0.005	0.006
	(2.75)	(3.51)	(2.73)	(2.92)	(1.01)	(2.57)	(0.97)	(1.10)
SIZE	−0.002***	−0.002***	−0.002***	−0.002***	0.002	0.018	0.002	0.003
	(−4.53)	(−3.47)	(−4.53)	(−4.13)	(0.16)	(1.52)	(0.14)	(0.25)
LEVE	−0.005***	−0.005***	−0.005***	−0.005***	−0.072***	−0.074***	−0.072***	−0.073***
	(−5.42)	(−5.45)	(−5.42)	(−5.53)	(−2.95)	(−2.99)	(−2.95)	(−2.98)
ROA	0.011***	0.012***	0.011***	0.011***	0.355***	0.369***	0.355***	0.354***
	(6.18)	(6.20)	(6.18)	(6.17)	(7.98)	(8.09)	(7.97)	(7.95)
VOL	−0.005	−0.006*	−0.005	−0.005	−0.163*	−0.179**	−0.162*	−0.163*
	(−1.56)	(−1.70)	(−1.55)	(−1.48)	(−1.95)	(−2.11)	(−1.95)	(−1.93)
YEAR	YES	YES	YES	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES	YES	YES	YES
N	11,059	11,059	11,059	11,059	11,059	11,059	11,059	11,059
R^2	0.048	0.045	0.048	0.050	0.026	0.023	0.026	0.026

The table shows estimates of panel regressions of dividend policy on institutional ownership from 2003 to 2011. The regression model with firm-fixed effects is specified as: $DIV_{i,t}(DIVDM_{i,t}) = \alpha_{1,i} + \alpha_2 MF_{i,t-1}(BIS_{i,t-1}) + \alpha_3 Control_{i,t-1} + Dummy\ (year) + \varepsilon_{i,t}$. The dependent variables are cash dividend over book value of assets (DIV) and dividend-paying dummy (DIVDM). The main explanatory variables are mutual fund ownership (MF) and BIS ownership (BIS). Variables are defined in Appendix 1. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

by private entities. Wu et al. (2015) also find that institutional investors reduce the incidence of corporate fraud of SOEs in China but the effect is insignificant for non-SOEs. In columns (1) and (2), FCF, MB, and ROA have positive and significant impacts on future dividend payouts, whereas the effect of LEVE is negative.

Corporate insiders can spend a firm's free cash flows for their own interests, which incur costs to minority shareholders. Hence, minority shareholders have a strong desire for firms with relatively high free cash flows to payout more dividends in the following year. We use relative free cash flows of a year to capture the potential agency costs of firms. Specifically, we run a cross-sectional regression of firms' free cash flow (FCF) on Tobin's Q, a proxy of growth opportunities, for each industry sector in a year, and estimate the relative free cash flows using the regression residuals. Lower FCF is a dummy variable coded 1 if the regression residual of a firm is in the bottom tercile of the sample, and higher FCF is 1 for the firms in the top tercile of the sample. The regression model of Eq. (1) is estimated separately for the higher FCF and lower FCF subsamples. Table 4 presents the regression results in columns (3) and (4).

We find that for the higher FCF subsample in column (3), the estimated coefficient on MF is positive and significant, while it is insignificant for the lower FCF subsample in column (4). In addition, the estimated coefficient on MF (0.017) in the higher FCF subsample is larger in magnitude than that for the whole sample regression (0.014, in column (3) of Table 3). A one standard deviation increase in MF increases cash dividend payouts by 9.26% for the firms with higher free cash flows.[21] This finding is consistent with our expectation that the role played by mutual funds on dividend policy is mainly driven by the subsample with relatively higher potential agency costs.[22] In contrast, the BIS ownership does not influence the dividend payout in columns (3) and (4).

4.4. Mutual fund investment horizons and the blockholders' threat of exit

In this section, we consider how the characteristics of mutual funds influence their effects on a firm's dividend policy. As documented by Gaspar et al. (2005), Chen et al. (2007), and Attig et al. (2012), the investment horizon of institutional investors is an important factor in explaining their monitoring incentives. Long-term institutional investors with stable investment strategies are more likely to enhance the governance quality of invested firms and profit from the performance improvement, whereas short-term investors who trade their shares frequently may not have the incentives to influence a firm's management decisions. Moreover, short-term investors' exit threat is less binding because the

[21] The estimate is obtained by multiplying the estimated coefficient (0.017) by one standard deviation of MF (0.098), divided by the average DIV (0.018).

[22] In untabulated tests, we examine the effects of institutional investors on high-FCF SOEs and high-FCF Non-SOEs, respectively. We find that mutual fund holdings are positively correlated with the dividend payments of high-FCF SOEs but the MF influence is less for high-FCF non-SOEs.

Table 4
State controlling shareholders and free cash flows.

	Dependent variable: DIV			
	SOEs (1)	Non-SOEs (2)	Higher FCF (3)	Lower FCF (4)
MF	0.018***	−0.001	0.017**	0.000
	(4.03)	(−0.19)	(2.27)	(0.03)
BIS	0.003	0.019	0.014	0.003
	(0.12)	(0.80)	(0.28)	(0.16)
FCF	0.010***	0.007***	0.022**	−0.003
	(4.20)	(2.78)	(2.19)	(−0.91)
GROWTH	0.001**	0.000	0.000	0.000
	(2.56)	(0.17)	(0.41)	(0.91)
STATE	0.000	−0.000	0.008***	0.006***
	(0.20)	(−0.15)	(2.65)	(3.01)
HERF10	−0.006	0.011***	−0.004	0.007*
	(−1.57)	(2.96)	(−0.45)	(1.83)
SOE			0.000	−0.001
			(0.13)	(−1.29)
MAO	0.026	−0.008	−0.050	0.006
	(0.72)	(−0.64)	(−1.06)	(1.06)
MB	0.001*	0.001*	0.001	−0.000*
	(1.86)	(1.86)	(1.26)	(−1.77)
SIZE	−0.004***	0.000	−0.001	−0.001**
	(−5.43)	(0.62)	(−0.69)	(−2.44)
LEVE	−0.005***	−0.002	−0.008**	0.000
	(−2.97)	(−1.61)	(−2.12)	(0.24)
ROA	0.019***	0.005***	0.013	0.001
	(5.27)	(3.13)	(1.11)	(0.75)
VOL	−0.005	−0.008	−0.010	0.003
	(−1.50)	(−1.48)	(−1.42)	(0.52)
YEAR	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES
N	6687	4070	2908	2853
R^2	0.084	0.020	0.043	0.038

The table shows estimates of panel regressions of dividend policy on institutional ownership from 2003 to 2011. The sample is partitioned into SOEs in column (1) and non-SOEs in column (2), and subsamples with higher free cash flows (FCF) in column (3) and lower free cash flows in column (4). The SOEs include the firms with either the central or local government, or a government agency as the controlling shareholder. The non-SOEs are firms owned by private entities. For each year and industry, we run a cross-sectional regression of a firm's FCF on Tobin's Q. The subsample of higher FCF includes the firms with regression residuals in the top tercile of the sample and the lower FCF subsample includes firms with regression residuals in the bottom tercile of the sample. Variables are defined in Appendix 1. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

Table 5
The effects of mutual fund investment horizon, large ownership, and large purchases.

	Dependent variable: DIV				
	Mutual fund investment horizon			Large mutual fund ownership	Large mutual fund purchases
	Full sample	SOEs	Non-SOEs		
	(1)	(2)	(3)	(4)	(5)
LMF				0.015***	
				(2.90)	
MF	0.027***	0.033***	0.009		0.008*
	(4.43)	(4.76)	(0.81)		(1.71)
MF × WACR	−0.031**	−0.036**	−0.024		
	(−2.35)	(−2.35)	(−1.02)		
WACR	−0.002	−0.004	0.002		
	(−0.65)	(−1.33)	(0.49)		
BIS	0.005	0.002	0.016	0.006	0.039
	(0.23)	(0.10)	(0.67)	(0.27)	(1.61)
FCF	0.010***	0.011***	0.007***	0.010***	0.014***
	(5.65)	(4.25)	(2.73)	(5.71)	(3.59)
GROWTH	0.000**	0.001**	0.000	0.001**	0.000
	(2.56)	(2.30)	(0.22)	(2.56)	(0.87)
STATE	0.004***	0.001	0.004*	0.004***	0.002
	(3.62)	(0.91)	(1.74)	(3.57)	(0.75)
HERF10	0.001	−0.006*	0.012***	0.001	−0.007
	(0.52)	(−1.93)	(3.49)	(0.40)	(−1.01)
SOE	−0.001			−0.001	−0.003
	(−1.37)			(−1.35)	(−1.44)
MB	0.001**	0.001*	0.001*	0.001***	0.001*
	(2.58)	(1.89)	(1.79)	(2.86)	(1.87)
SIZE	−0.002***	−0.004***	0.000	−0.002***	−0.003**
	(−4.76)	(−5.57)	(0.31)	(−3.95)	(−2.50)
MAO	−0.003	0.027	−0.008	−0.003	−0.014
	(−0.25)	(0.71)	(−0.63)	(−0.25)	(−0.55)
LEVE	−0.005***	−0.005***	−0.002*	−0.005***	−0.005
	(−5.39)	(−3.00)	(−1.66)	(−5.36)	(−1.53)
ROA	0.011***	0.019***	0.005***	0.011***	0.025***
	(6.25)	(5.27)	(3.07)	(6.23)	(4.45)
VOL	−0.005	−0.005	−0.008	−0.006*	0.008
	(−1.64)	(−1.47)	(−1.47)	(−1.70)	(0.47)
YEAR	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES
N	11,059	6687	4070	11,059	4468
R^2	0.050	0.085	0.022	0.048	0.058

The table shows estimates of panel regressions of dividend policy on institutional ownership from 2003 to 2011. In columns (1)–(3), mutual fund investment horizon is measured as the weighted average churn rate (WACR) of a firm's mutual fund investors (see calculation details in Appendix 2). In column (4), the large mutual fund ownership (LMF) is measured by the aggregate ownership of a firm's mutual fund investors who each holds at least 1% of the firm's shares. In column (5), the regression model is estimated for a subsample with large mutual fund purchases. Variables are defined in Appendix 1. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

firm expects the investors to exit due to the investor's short-term orientation and increasing the dividend will be futile in preventing exit. In contrast, firms are more concerned with the exit threat of long-term investors as these investor's actions to sell carry more value-relevant information and will likely depress stock prices. Both Chen et al. (2007) and Attig et al. (2012) find that institutional investors with longer investment horizons have greater incentives and efficiencies to monitor firms. To identify the mutual fund investment horizon, we follow the method outlined in Gaspar et al. (2005) and measure the speed of mutual funds' portfolio adjustments by the average "churn rate" of their ownership. We collect quarterly data on mutual fund ownership from CSMAR. The formulas and calculation details of the weighted average churn rate (WACR) of each firm are described in Appendix 2. A higher WACR indicates a shorter investment horizon, and *vice versa*.

Following Attig et al. (2012), we re-estimate the regression model of Eq. (1) by adding an interaction term of mutual fund ownership (MF) and WACR, and expect that a higher WACR reduces the impact of MF on dividend policies. The regression results, including those for subsamples of SOEs and non-SOEs, are presented in columns (1)–(3) of Table 5. The estimated coefficient on the interaction term MF × WACR is significantly negative, while the coefficient on MF remains significantly positive (see column (1)). These results suggest that a shorter investment horizon, or a higher churn rate, reduces the effects of mutual fund ownership on dividend payouts. The results are similar for the SOE sample in column (2). The effects diminish in the non-SOE sample in column (3) but the estimated coefficients have the expected signs. BIS is not significant in explaining dividends. The estimated coefficients on the control variables are consistent with those in Table 3. In sum, mutual funds with longer investment horizons are more likely to play a proactive role in influencing a firm's dividend policy.

When the stock ownership of institutional investors in a firm is large, the institutions' incentives and ability to influence the board decisions increase. To demonstrate this, we follow Chen et al. (2007) and Li et al. (2011) and measure large mutual fund ownership (LMF) by the aggregate ownership of a firm's mutual fund investors where each fund holds at least 1% of the firm's equity. Such mutual funds have more incentives and abilities to influence corporate decisions than mutual funds with low shareholdings in firms. During our sample period, LMF is positive for 4247 firm-year observations

Table 6
The effect of tradable shares proportion and the effects before and after 2007.

	Dependent variable: DIV				
	2003–2011			2003–2007	2008–2011
	Full sample (1)	SOEs (2)	Non-SOEs (3)	(4)	(5)
MF	0.021***	0.027***	−0.024	0.015***	0.004
	(3.24)	(3.95)	(−1.46)	(3.11)	(1.36)
TS × MF	−0.013	−0.022**	0.033		
	(−1.55)	(−2.51)	(1.59)		
TS	0.001	0.003*	−0.003		
	(1.34)	(1.78)	(−1.16)		
BIS				0.018	0.020
				(1.56)	(1.43)
FCF	0.010***	0.011***	0.007***	0.005*	0.006***
	(5.69)	(4.24)	(2.75)	(1.76)	(2.62)
GROWTH	0.001***	0.001**	0.000	0.000	0.000
	(2.77)	(2.41)	(0.31)	(1.60)	(1.27)
STATE	0.004*	0.002	−0.002	0.001	0.004**
	(1.74)	(0.86)	(−0.61)	(0.44)	(2.22)
HERF10	0.001	−0.007*	0.009**	−0.002	0.006*
	(0.41)	(−1.70)	(2.19)	(−0.22)	(1.76)
SOE	−0.001			−0.002**	0.001
	(−1.40)			(−1.97)	(0.56)
MAO	−0.003	0.027	−0.008	0.064	−0.010
	(−0.23)	(0.68)	(−0.65)	(1.47)	(−1.30)
MB	0.001**	0.001*	0.001*	0.001	0.000**
	(2.54)	(1.76)	(1.67)	(0.89)	(2.08)
SIZE	−0.002***	−0.004***	0.000	−0.004***	−0.001
	(−4.28)	(−5.12)	(0.34)	(−4.45)	(−1.05)
LEVE	−0.005***	−0.005***	−0.002*	−0.002	−0.002*
	(−5.44)	(−3.16)	(−1.71)	(−1.30)	(−1.65)
ROA	0.011***	0.018***	0.005***	0.007***	0.002
	(6.29)	(5.28)	(2.65)	(3.40)	(0.87)
VOL	−0.005	−0.004	−0.009	0.033	−0.004
	(−1.45)	(−1.35)	(−1.58)	(1.40)	(−1.01)
YEAR	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES
N	11,059	6687	4070	5002	6057
R^2	0.048	0.086	0.023	0.026	0.010

The table shows estimates of panel regressions of dividend policy on institutional ownership. In columns (1)–(4), the regression is estimated for the years from 2003 to 2011. TS refers to the float defined in Appendix. In column (5), the regression is estimated for the years from 2008 to 2011. Variables are defined in Appendix 1. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

Table 7
Effects of changes in institutional ownership on changes in dividend policy.

	Dependent variable: ΔDIV				
	Full sample (1)	Full sample (2)	Full sample (3)	SOEs (4)	Non-SOEs (5)
ΔMF	0.006*		0.006*	0.010**	−0.001
	(1.86)		(1.85)	(2.38)	(−0.19)
ΔBIS		0.010	0.009	−0.005	0.058**
		(0.50)	(0.48)	(−0.22)	(2.17)
ΔFCF	0.002	0.002	0.002	0.001	0.001
	(1.27)	(1.34)	(1.27)	(0.64)	(0.40)
ΔGROWTH	0.000	0.000	0.000	0.000	−0.000
	(0.63)	(0.63)	(0.64)	(1.25)	(−0.06)
ΔSTATE	0.003	0.003	0.003	0.004	−0.000
	(1.37)	(1.34)	(1.37)	(1.33)	(−0.06)
ΔHERF10	0.004	0.004	0.004	0.006	0.005
	(1.20)	(1.14)	(1.19)	(1.17)	(0.95)
ΔSOE	−0.001	−0.001	−0.001		
	(−0.93)	(−0.92)	(−0.93)		
ΔMAO	−0.007	−0.007	−0.007	−0.002	−0.008
	(−0.53)	(−0.52)	(−0.53)	(−0.18)	(−0.59)
ΔMB	0.000	0.000	0.000	0.000	0.000
	(1.26)	(1.56)	(1.23)	(0.79)	(0.84)
ΔSIZE	−0.000	−0.000	−0.000	−0.002***	0.001
	(−0.71)	(−0.40)	(−0.71)	(−2.81)	(0.94)
ΔLEVE	0.000	0.000	0.000	0.002	0.002*
	(0.48)	(0.42)	(0.48)	(1.28)	(1.72)
ΔROA	−0.001	−0.001	−0.001	−0.001	0.000
	(−0.71)	(−0.68)	(−0.73)	(−0.69)	(0.14)
ΔVOL	−0.002	−0.002	−0.002	0.001	−0.008
	(−0.46)	(−0.51)	(−0.46)	(0.36)	(−0.92)
YEAR	YES	YES	YES	YES	YES
INDUSTRY	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES
N	9300	9300	9300	5620	3188
R^2	0.005	0.005	0.005	0.008	0.018

The table shows estimates of the regression models that use the changes in institutional ownership to explain the changes in dividend policy from 2003 to 2011. The regression model is specified as: $\Delta DIV_{i,t} = \alpha_1 + \alpha_2 \Delta MF_{i,t-1}(\Delta BIS_{i,t-1}) + \alpha_3 \Delta Control_{i,t-1} + Dummy\ (industry, year) + \varepsilon_{i,t}$. The dependent variable is the change in DIV from year $t-1$ to t (ΔDIV). The main explanatory variables are the change in MF from year $t-2$ to $t-1$ (ΔMF) and the changes in BIS from year $t-2$ to $t-1$ (*ΔBIS*). Variables are defined in Appendix 1. Year and industry dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

(or 32%) and the average shareholding is 6.2% of the total shares in issue. We re-estimate the regression model specified by Eq. (1) by replacing $MF_{i,t-1}$ by $LMF_{i,t-1}$. In the regression results reported in column (4) of Table 5, the estimated coefficient on LMF (0.015) is significantly positive at the 1% level and is larger in magnitude than the corresponding figure for MF (0.014) in column (3) of Table 3. In terms of economic significance, a one standard deviation increase in LMF increases dividend payouts by 6.75% in the next year.[23] The estimated coefficients on the control variables are similar to those presented before. The results indicate that when we only consider large and concentrated mutual fund ownership, their effects on firms' dividend policies remain positive and significant.

In order to examine the changes in a firm's dividend policies that are caused by large increments in mutual fund ownership, we calculate the quarterly changes in mutual fund ownership and code firm years with the highest quarterly change (in the top 20%) in a year as large mutual fund purchases. We then re-estimate the regression model of Eq. (1) for the subsample with large mutual fund purchases and expect that dividend payments increase in the following year. Consistent with our expectation, in column (5) of Table 5, the estimated coefficient on MF is positive and significant at the 10% level. Therefore, our results provide some evidence that dividend payments increase following large block purchases by mutual funds.

Mutual funds' threat of exit is greater if they are the important traders in stock markets who can sell shares freely. The prior literature shows that low firm float in stock markets can enhance the price pressure exerted by the trading of important shareholders, such as insiders, institutional investors and other blockholders (Holthausen et al., 1987; Intintoli and Kahle, 2010). Under the split share structure in Chinese firms before 2005, mutual funds are the main blockholders who hold tradable shares and they are able to exert pressures on managers through the threat of exit. When firms have a lower free share float in the market, mutual funds' selling decisions may have a more significant effect on the market price and investor sentiment. We examine how float influences mutual funds' effects on dividends from two perspectives. First, we capture firm float by the proportion of tradable shares (TS) before firms finish their split share structure reform (pre-2005 period), and define float by the proportion of tradable shares (TS) minus the proportion of state ownership after the reform.[24] The

[23] We obtain this estimate by multiplying the estimated coefficient (0.015) by one standard deviation of LMF (0.045), divided by the average DIV (0.011).

[24] We do this because even if state-owned shares become tradable, they are less actively traded than other shares since government agencies want to maintain their control. We thank a referee for this suggestion.

Table 8
The determinants of changes in institutional ownership.

	Dependent variable					
	ΔMF			ΔBIS		
	Full sample (1)	SOEs (2)	Non-SOEs (3)	Full sample (4)	SOEs (5)	Non-SOEs (6)
ΔDIV	1.761	0.686	2.200	3.116**	2.591	4.133**
	(0.37)	(0.12)	(0.24)	(2.25)	(1.35)	(2.29)
ΔFCF	0.761	1.161	0.657	0.016	0.088	−0.034
	(1.31)	(1.39)	(0.73)	(0.13)	(0.50)	(−0.19)
ΔGROWTH	−0.009	−0.043	0.057	0.022	0.027	0.011
	(−0.14)	(−0.42)	(0.66)	(1.41)	(1.02)	(0.72)
ΔSTATE	1.228**	1.269*	−0.924	−0.024	0.023	0.165
	(2.29)	(1.88)	(−0.77)	(−0.18)	(0.12)	(0.59)
ΔHERF10	1.258	1.019	−0.063	−0.196	−0.120	−0.574
	(1.27)	(0.86)	(−0.03)	(−0.79)	(−0.35)	(−1.05)
ΔSOE	−0.166			−0.001		
	(−0.64)			(−0.01)		
ΔMAO	0.127	0.413***	−0.160	−0.605	−1.028	−0.525
	(0.03)	(2.67)	(−0.04)	(−0.71)	(−0.50)	(−0.60)
ΔMB	0.109	0.037	0.133	−0.042**	−0.036	−0.047*
	(1.45)	(0.34)	(1.18)	(−2.19)	(−1.10)	(−1.85)
ΔSIZE	−0.184	−0.953***	0.411	0.089*	0.121*	0.104
	(−0.97)	(−3.43)	(1.33)	(1.90)	(1.88)	(1.29)
ΔLEVE	0.159	1.717**	−0.225	−0.024	0.282	−0.259**
	(0.47)	(2.57)	(−0.52)	(−0.20)	(1.03)	(−1.98)
ΔROA	0.672*	1.419**	0.064	−0.319**	−0.408*	−0.472**
	(1.87)	(1.97)	(0.14)	(−2.34)	(−1.78)	(−2.37)
ΔVOL	0.108	1.335*	−2.560**	−0.074	0.157	−0.195
	(0.10)	(1.88)	(−2.00)	(−0.31)	(0.71)	(−0.47)
YEAR	YES	YES	YES	YES	YES	YES
INDUSTRY	YES	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES	YES
N	9300	5620	3188	9300	5620	3188
R^2	0.030	0.042	0.025	0.010	0.009	0.020

The table shows estimates of the regression models that use the changes in dividend policy to explain the changes in institutional ownership from 2003 to 2011. The regression model is specified as: $\Delta MF_{i,t}(\Delta BIS_{i,t}) = \alpha_1 + \alpha_2 \Delta DIV_{i,t-1} + \alpha_3 \Delta Control_{i,t-1} + Dummy\,(industry, year) + \varepsilon_{i,t}$. The dependent variables are the change in MF from year $t-1$ to t (ΔMF) and the changes in BIS from year $t-1$ to t (ΔBIS). The main explanatory variables are the change in DIV from year $t-2$ to $t-1$ (ΔDIV). Variables are defined in Appendix 1. Year and industry dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

mutual funds' effects are expected to be stronger for firms with a lower float. We re-estimate the regression model of Eq. (1) by adding TS and MF × TS as two explanatory variables for the period from 2003 to 2011.[25] Columns (1)–(3) of Table 6 show the regression results. In column (2) for the SOEs, the coefficient estimate on MF × TS is negative and significant and the coefficient on MF remains positive and significant. The effects are significant for both TS and MF × TS for SOEs in column (2) but are insignificant for non-SOEs in column (3). Overall, the results are consistent with our expectations.

From the second perspective, we measure the effects of float before and after most firms finish their reform (i.e., from 2003 to 2007 and from 2008 to 2011). In the pre-reform period, low market float can enhance the price pressure exerted by the trading of mutual funds, who are the most important tradable shareholders. According to the exit threat theory, such price pressure could constitute threats to managers and controlling shareholders. After most firms have transformed their non-tradable shares into tradable shares, the mutual funds' effects and their threat to exit will likely be diluted. Therefore, we expect that the mutual funds will have a stronger effect on dividend policies during the pre-reform period than the post-reform period. We estimate the regression of Eq. (1) for the periods from 2003 to 2007 and from 2008 to 2011, separately.[26] The regression results are presented in columns (4) and (5) of Table 6. The positive effects of mutual fund ownership on dividend payments exist in both sub-periods. The magnitude of the estimated coefficient on MF is larger for the earlier period (0.015) than for the later period (0.004). BIS does not have a significant effect on DIV. Therefore, the mutual funds have a stronger effect on dividends in the earlier period when the market has a lower free float. Moreover, the influence of mutual funds (and the non-influence of BIS) is not conditioned on the enacted governance changes in 2008.[27]

4.5. Does institutional ownership drive changes in dividend payments?

An important concern is that institutional investors may prefer firms currently paying a cash dividend to firms that do not currently pay a cash dividend, and choose firms with higher cash dividends among dividend-paying firms. To address this issue, we study the relation between the changes in dividend policy

[25] We conduct a robustness test by estimating the regression model with MF × TS and TS for the full sample period from 2003 to 2011. The estimated coefficients on MF and MF × TS are both significant and have the expected signs. The estimated coefficient on TS is negative but becomes less significant because the variable TS has very small variations after 2007.

[26] Other motivations for us to split the sample in this way are to incorporate the potential effects of the bull market from 2005 to 2007 and a regulatory change. In 2008, in order to further encourage listed firms to pay cash dividends to shareholders, the CSRC (CSRC, 2008) required listed firms that apply for permission to issue new shares to distribute cumulatively at least 30% of the average annual distributable profits realized in the most recent three years as cash dividends (before October 2008, the percentage was 20% in the form of cash or stock dividends). The new regulation should have some impact on firms' decisions regarding dividend payouts.

[27] We also conduct the same tests for periods from 2003 to 2006 and from 2007 to 2011 separately. Untabulated results show that the coefficients on MF are significantly positive in both time periods.

Table 9
Effects of institutional ownership on firm performance.

	Dependent variable					
	Adj. ROA			Adj. Q		
	Full sample (1)	SOEs (2)	Non-SOEs (3)	Full sample (4)	SOEs (5)	Non-SOEs (6)
MF	0.048***	0.056***	0.042**	0.445**	0.327*	0.852**
	(4.75)	(4.66)	(2.38)	(2.25)	(1.75)	(1.99)
BIS	0.050	0.068	0.009	−0.048	0.461	−2.850*
	(1.24)	(1.53)	(0.08)	(−0.05)	(0.67)	(−1.89)
DIV	0.612***	0.572***	0.512***	5.608***	4.650***	4.800***
	(11.75)	(9.56)	(5.14)	(6.86)	(4.84)	(3.15)
STATE	0.044***	0.025***	0.034	−0.207**	−0.143*	0.184
	(5.59)	(3.21)	(1.53)	(−2.47)	(−1.75)	(0.86)
LPO	−0.010	−0.002	−0.009	−0.580***	−0.172	−0.663**
	(−0.56)	(−0.08)	(−0.31)	(−2.82)	(−0.68)	(−2.24)
FORO	0.013	0.012	−0.010	−0.817***	−0.939**	−0.659
	(0.85)	(0.56)	(−0.49)	(−2.77)	(−1.98)	(−1.63)
MAO	0.053	0.027	0.082**	0.542	−3.555*	0.738
	(1.20)	(0.24)	(2.33)	(0.79)	(−1.71)	(1.09)
HERF10	0.092***	0.011	0.137***	0.063	0.092	−0.158
	(5.88)	(0.79)	(4.00)	(0.72)	(0.47)	(−1.15)
TANG	0.010	0.002	0.003	0.195*	0.182*	0.192
	(1.07)	(0.26)	(0.17)	(1.79)	(1.70)	(0.99)
LEVE	0.044***	0.035***	0.091***	0.237*	−0.201	0.548***
	(3.82)	(2.86)	(4.44)	(1.95)	(−1.52)	(2.62)
SIZE	−0.010***	−0.008***	−0.006*	−0.243***	−0.229***	−0.235***
	(−4.70)	(−3.01)	(−1.74)	(−8.42)	(−7.07)	(−5.34)
ADJR	0.007***	0.005***	0.008***	0.127***	0.125***	0.106***
	(6.14)	(3.93)	(4.04)	(8.71)	(7.41)	(4.13)
DUA	0.004	0.002	0.010	−0.042	−0.025	0.020
	(0.96)	(0.49)	(1.58)	(−0.90)	(−0.52)	(0.24)
INDEP	0.061**	0.047**	0.016	0.338	−0.153	0.904*
	(2.45)	(2.10)	(0.32)	(1.31)	(−0.61)	(1.79)
DIRECTOR	−0.001	−0.000	−0.000	0.003	0.004	0.003
	(−0.86)	(−0.21)	(−0.14)	(0.35)	(0.37)	(0.15)
YEAR	YES	YES	YES	YES	YES	YES
CLUSTER	YES	YES	YES	YES	YES	YES
N	10,680	6480	3901	10,680	6480	3901
R^2	0.048	0.046	0.076	0.143	0.108	0.208

The table shows estimates of panel regressions of firm performance on institutional ownership from 2003 to 2011. The regression model with firm-fixed effect is specified as: $Adj.ROA_{i,t}(Adj.Q_{i,t}) = \alpha_{1,i} + \alpha_2 MF_{i,t-1} + \alpha_3 BIS_{i,t-1} + \alpha_4 Control_{i,t-1} + Dummy\ (year) + \varepsilon_{i,t}$. The dependent variables are return on assets (Adj.ROA) and Tobin's Q (Adj.Q). The main explanatory variables are mutual fund ownership (MF) and BIS ownership (BIS). Variables are defined in Appendix 1. The regression model is estimated for the full sample and the SOE and non-SOE subsamples. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

and the lagged changes in institutional ownership.[28] Table 7 reports the regression results. The dependent variable, ΔDIV, is the change in a firm's cash dividend from time $t-1$ to t, and the main explanatory variable, ΔMF (or ΔBIS), is the change in mutual fund ownership (or change in BIS ownership) from time $t-2$ to $t-1$. All other control variables are also measured as changes lagged by one year. This method is used by Aggarwal et al. (2011) and Li et al. (2011), among others.[29]

The regression results for the full sample include MF in column (1), BIS in column (2), and both MF and BIS in column (3). The results for SOEs and non-SOEs are shown, respectively, in columns (4) and (5). As shown in column (1), the estimated coefficient on ΔMF is positive and significant at the 10% level in explaining ΔDIV, whereas the coefficient on ΔBIS is insignificant in column (2). When we include both ΔMF and ΔBIS in the same regression in column (3), the results confirm our earlier findings that changes in mutual fund ownership affect changes in dividend policy,[30] while the changes in BIS ownership do not. Consistent with the regression results shown in Table 4, the change in MF is significant at the 5% level in explaining the change in DIV for SOEs in column (4), but is insignificant for non-SOEs in column (5).

We also conduct change regressions (the first-difference regressions) in the reverse direction to examine if firms with higher dividend payments can attract institutional investors, following the research designs used in Aggarwal et al. (2011), Desai and Jin (2011), and Li et al. (2011). Changes in dividend payments, from time $t-2$ to $t-1$, ΔDIV, are used to explain changes in institutional ownership from time $t-1$ to t. The coefficients on ΔMF (or ΔBIS) are multiplied by 100. We use the same firm-specific control variables as in previous tables in a change format and lagged by a year. Table 8 reports the results of the reverse change regressions. In columns (1)–(3), the dependent variable is ΔMF. The estimated coefficients on ΔDIV are always insignificant in the regressions for the full sample, SOEs, and non-SOEs. Therefore, the evidence is consistent with mutual fund ownership affecting dividend policy, but not with dividend policy attracting mutual fund ownership. When the dependent variable is ΔBIS, the estimated coefficients on ΔDIV are positive and significant for the full sample and non-SOEs (see columns (4) and (6)) and have a positive sign for SOEs in column (5). Therefore, although higher BIS institutional ownership cannot influence firms to increase future dividend payouts, firms with higher dividend payouts (ΔDIV) can attract higher BIS ownership.

[28] The approach also eliminates the impacts of time-invariant and unobservable firm characteristics on dividend policy.

[29] The results are consistent when we include the lagged level of dividend payout, DIV_{t-1}, as a regressor in the change regression to account for the situations in which changes in dividend payout are limited for firms that already have a high level of dividend.

[30] We also conduct the Granger causality test, which rejects the null hypothesis that MF does not Granger cause DIV and DIVDM.

5. Revisiting how mutual fund ownership affects firm performance

Financial institutions, acting as monitors of management, can help reduce agency costs caused by excessive free cash flows and increase the profitability of firms. Yuan et al. (2008) find that equity ownership by mutual funds has a positive effect on firm performance in China. In this section, we revisit and extend the Yuan et al. (2008) study by adding the effects of BIS. We capture firm performance by Tobin's Q (Q) and return on assets (ROA). We calculate industry-adjusted Tobin's Q (Adj.Q) and industry-adjusted return on assets (Adj.ROA) by subtracting their respective industry medians from a firm/year's Q and ROA. Following Yuan et al. (2008), we use the firm fixed-effect model with year dummies and robust standard errors clustered at the firm level. All explanatory variables are lagged by one year. In addition to the control variables used in the previous sections, we also include the number of directors (DIRECTOR), the number of independent directors (INDEP), and a dummy variable capturing the duality of CEO and chairman (DUA), to control for board characteristics (Boone et al., 2007; Bennedsen et al., 2008). Other control variables include legal person ownership (LPO), foreign investors' ownership (FORO), tangibility (TANG), and adjusted stock returns (ADJR). Detailed definitions of these variables are given in Appendix 1.

Table 9 presents the regression results to explain Adj.ROA and Adj.Q respectively in columns (1)–(3) and columns (4)–(6). Consistent with Yuan et al. (2008) and Aggarwal et al. (2011), mutual fund ownership (MF) is always significantly positive in explaining firm performance, measured by Adj.ROA and Adj.Q, in all columns. In contrast, the estimated coefficients on BIS are not significant in most regressions and are even negative and significant in explaining the Adj.Q for the non-SOEs in column (6). This is consistent with the literature (Chen et al., 2007; Ferreira and Matos, 2008) that consider banks and insurance companies as "grey" institutions who play limited roles in improving firms' performance. Untabulated regression results show that when ROA is defined as the operating profit divided by total assets, we reach similar conclusions to those shown in Table 9.

6. Robustness tests

6.1. Instrumental variables methods

An alternative way to address the potential endogeneity problem of mutual funds' ownership with respect to dividend payments is to use instrumental-variable estimation. Following the approaches used by Yuan et al. (2008), Aggarwal et al. (2011), and Ferreira and Matos (2008), we use the index inclusion of a firm as the first instrument for mutual fund ownership. A dummy variable (INDEX) is defined to take the value of one if a firm is included in either the Shanghai 180 index or Shenzhen Component index in a year and zero otherwise. A firm's membership in these indexes depends on a firm's market capitalization, stock trading liquidity, and market position in its industry sector. Therefore, the firms that are included in these indexes can attract institutional investors due to higher liquidity. However, the firms' dividend policy is not an inclusion criterion of these indexes and therefore is not related to index memberships.

Following Aggarwal et al. (2014), we use the legal person ownership (LPO) as the second instrumental variable to mutual fund ownership. A legal person is an enterprise or economic entity with a legal status. As the shares owned by legal persons are non-tradable, a higher LPO reduces the number of shares that can be freely traded by institutional investors in the market. Meanwhile, there is no relation between legal person ownership and dividends.[31] The correlation coefficients between LPO and DIV and between LPO and DIVDM are −0.08 and −0.12, respectively, in our sample. Consistent with Aggarwal et al. (2014), LPO does not have a relation with dividend payments, but is significantly and negatively related to mutual fund ownership.

We use the standard two-stage least squares (2SLS) regressions. In the first-stage regression, the dependent variable is mutual fund ownership (MF) and the explanatory variables that are lagged by one year are LPO, INDEX, and the control variables used in Table 3. Industry and year dummies are also included. The results are shown in column (3) of Table 10. Mutual fund ownership is positively and significantly associated with index membership, but is negatively and significantly related to LPO.

In the second-stage regression, the predicted values of mutual fund ownership (Predicted MF) derived from the first-stage regression are used in the firm-fixed effect model of Eq. (1) to replace the

Table 10
Instrumental variable estimations.

	Second-stage regression		First-stage regression	
	Dependent variable			
	DIV (1)	DIVDM (2)		MF (3)
Predicted MF	0.077***	0.613***	LPO	−0.028***
	(3.10)	(2.78)		(−3.40)
			INDEX	0.001***
				(4.42)
FCF	0.003	0.070	FCF	0.093***
	(1.08)	(0.63)		(10.49)
GROWTH	0.000	0.007	GROWTH	0.002
	(1.59)	(1.11)		(1.13)
STATE	0.006***	0.161***	STATE	−0.031***
	(4.47)	(3.51)		(−7.72)
HERF10	0.005*	0.242***	HERF10	−0.059***
	(1.84)	(2.65)		(−7.73)
SOE	−0.001	−0.006	SOE	−0.004**
	(−0.98)	(−0.29)		(−2.38)
MAO	−0.009	0.297	MAO	0.084***
	(−0.76)	(1.13)		(6.17)
MB	−0.000	−0.002	MB	0.021***
	(−0.69)	(−0.09)		(26.24)
SIZE	−0.004***	0.006	SIZE	0.024***
	(−4.44)	(0.21)		(27.64)
LEVE	−0.005***	−0.073***	LEVE	−0.003**
	(−4.97)	(−2.91)		(−2.05)
ROA	−0.001	0.275	ROA	0.168***
	(−0.28)	(1.51)		(16.34)
VOL	−0.001	−0.141	VOL	−0.065**
	(−0.35)	(−1.34)		(−2.83)
CLUSTER	YES	YES	YEAR	YES
YEAR	YES	YES	INDUSTRY	YES
N	11,059	11,059	*N*	11,059
R^2	0.047	0.023	R^2	0.237

The table shows estimates of the standard two-stage instrumental variable regressions. In first-stage regression, mutual fund ownership (MF) is instrumented by legal person ownership (LPO), index inclusion dummy (INDEX), control variables and year and industry dummies. All explanatory variables are lagged by one year. The index inclusion dummy is one if the firm is included in the Shanghai 180 Index or the Shenzhen Component Index in a year and otherwise zero. The predicted MF, generated from the instrumental regression, is included as the main explanatory variable in the second-stage firm-fixed effect regression of dividend policy, which is specified as: $DIV_{i,t}(DIVDM_{i,t}) = \alpha_{1,i} + \alpha_2 Predicted\ \ MF_{i,t-1} + \alpha_3 Control_{i,t-1} + Dummy\ (year) + \varepsilon_{i,t}$. The dependent variables are cash dividend over book value of assets (DIV) and dividend-paying dummy (DIVDM). Variables are defined in Appendix 1. Year dummies are included and standard errors are corrected for firm-level clustering. Robust t-statistics are reported in parentheses. *, **, *** indicate the 10%, 5%, and 1% significance levels, respectively. *N* refers to number of observations.

[31] Following Aggarwal et al. (2014), we add LPO and INDEX as two control variables to the regression model of Eq. (1) to explain dividend policies. The estimated coefficients on them are insignificant.

original mutual fund ownership variable (MF). The regression results are presented in columns (1) and (2) of Table 10, respectively, with DIV and DIVDM as the dependent variables. Comparing Table 10 with the corresponding results in Table 3, the t-statistics of mutual fund ownership are reduced but the coefficient estimates are still positive and significant for both DIV and DIVDM. The signs on the coefficients on most control variables are similar to those in the previous tables although some become less significant. Our findings on the positive impact of mutual fund ownership on dividends are robust to the instrumental variable estimations.

6.2. Robustness checks of other control variables and alternative measures

We expand the regression model specified by Eq. (1) to include additional control variables for board room characteristics, which are DUA, INDEP, and DIRECTOR (respectively, dual chair and CEO position, number of independent directors, and number of directors). Untabulated results show that our main conclusions on mutual fund ownership (MF) and BIS ownership (BIS) remain the same as before despite the inclusion of controls for board room governance variables. We also add the dividend and mutual fund ownership lagged by one year as explanatory variables to Eq. (1). The estimated coefficients on the lagged DIV and MF are both positive and significant at the 1% level.

Other tests use cash dividend per share as the dependent variable. In general, the findings are consistent with the results when DIV and DIVDM are used as the dependent variables. We do not use dividend yield (cash dividend over stock price) because it is likely to be influenced by the substantial stock price variation in China.

7. Conclusions

By investigating the empirical relation between institutional ownership and firms' dividend policies in China from 2003 to 2011, we find evidence suggesting that mutual fund ownership is able to exert influence on firms to pay cash dividends and to increase cash dividends. The mutual funds' positive effects on dividend policy are stronger for firms that are more likely to suffer from agency problems, i.e., firms with relatively higher free cash flows, and the results are consistently positive and significant for state-owned enterprises. Therefore, our results show mutual funds matter for explaining firms' dividend policies in China. However, other institutional investors including banks, insurance companies, and securities companies do not appear to have any significant influence on firms' dividend payments.

The monitoring effects of mutual funds are stronger when the funds' investments are stable and the ownership is large. Consistent with the exit threat theory, mutual fund ownership influences listed firms' dividend payouts if the funds' equity ownership constitutes an important proportion of tradable A-shares in the stock market. Furthermore, firms that already have relatively high levels of dividend payout do not attract mutual fund investors but do attract BIS institutions. Based on a plethora of tests, our study contributes to the literature by carefully examining the effects of institutional investors' stock holdings on dividend payments.

As an adjunct test, we examine whether institutional ownership is associated with higher firm performance as measured by return on assets and Tobin's Q. Our empirical results show that mutual funds can help improve firm performance and thus corroborate the earlier work of Yuan et al. (2008). In contrast, BIS ownership is not positively related with firm performance.

Overall, our research shows that mutual funds exert influences over one of a firm's major decision variables, namely, cash dividends. In particular, mutual funds appear to drive the firms in which they have invested to pay out higher dividends. This influence is stronger in firms that have higher agency costs. By forcing these firms to pay higher cash dividends it helps prevent their free cash flows from being wasted on unproductive activities. In this respect, mutual funds have been a force for good governance in China's listed firms.

Disclaimer

The views in this article are those of the authors and not necessarily those of Ernst & Young LLP or any other member firm in the global EY organization.

Appendix 1. Variable definitions

Variable	Notation	Definition
Adjusted stock returns	ADJR	Annual stock returns minus annual market index return, where the market index is either the Shanghai or Shenzhen composite market index, depending on the listing location
Board size	DIRECTOR	Number of directors on the board
Dividend dummy	DIVDM	Dummy variable, which equals one if a firm pays a cash dividend (DIV > 0) and zero otherwise
Dividend payout	DIV	Dividend per share over the book value of assets per share in a year
Duality of CEO and chairman	DUA	A dummy variable that equals one if the CEO and chairman are separate individuals, and zero otherwise
Firm size	SIZE	Natural logarithm of total assets
Foreign ownership	FORO	Sum of B-shares, H-shares and non-tradable foreign founders' shares divided by the total number of shares in issue. B-shares are traded in US dollars or Hong Kong dollars on the SHSE and SZSE. H-shares are the shares of companies in mainland China that are traded on the Hong Kong Stock Exchange
Free cash flow	FCF	Net operating cash flow (calculated as earnings before interest, taxes and depreciation, or EBITDA, less net capital expenditure) over total assets
Growth opportunity	GROWTH	Annual percentage change in sales
Independent directors	INDEP	Percentage of independent directors on the board
Index dummy	INDEX	A dummy variable, which equals one if the firm is included in either the Shanghai 180 Index or the Shenzhen Composite Index, and zero otherwise

(continued on next page)

(*continued*)

Variable	Notation	Definition
Industry-adjusted ROA	Adj.ROA	The ROA of a firm minus the median value of the ROAs of all firms in an industry sector. Industries are classified according to the two-digit industry codes provided by the CSMAR database
Industry-adjusted Tobin's Q	Adj.Q	The Tobin's Q of a firm minus the median value of the Tobin's Qs of all firms in an industry sector. Industries are classified according to the two-digit industry codes provided by the CSMAR database
Institutional ownership	MF, BIS	Number of shares owned by institutional investors over a firm's total number of shares in issue. MF represents mutual funds and qualified foreign institutional investors under the QFII scheme. BIS represents other institutional investors including banks, insurance companies, and securities companies
Large mutual fund ownership	LMF	Aggregate ownership of a firm's mutual fund investors who each holds at least 1% of the firm's total number of shares in issue
Legal person ownership	LPO	Shares owned by domestic corporations and other entities over the total number of shares in issue
Leverage	LEVE	Total liabilities over total assets.
Managerial ownership	MAO	Number of shares held by senior managers over the total number of shares in issue
Market-to-book ratio	MB	The market value of assets divided by the book value of assets at the year end. Market value of assets is defined as the market value of equity plus book value of debt
Mutual fund investment horizon	WACR	Weighted average churn rate of a firm's mutual fund investors. See calculation details in Appendix 2
Ownership Concentration	HERF10	Sum of the squared percentage of shares held by the top 10 non-state shareholders
Proportion of tradable A-shares	TS	In the pre-2005 period, it is defined as the number of tradable A-shares over the total number of shares in issue. For post-2005 period, it is defined as number of tradable A-shares minus state-owned shares, scaled by total number of shares. Tradable A-shares were held by individual and institutional investors and can be freely traded in secondary markets. Non-tradable shares were held by the government, its affiliated bodies and legal persons. In 2005, the CSRC required all firms to convert their non-tradable shares to tradable shares. The data on non-tradable shares are obtained from the CSMAR database
Return on assets	ROA	Net profit over total assets
State-owned enterprise	SOE	A dummy variable that equals one if the ultimate controlling shareholder of a firm is the central or local government, or a government agency, and zero otherwise
State ownership	STATE	Number of state-owned shares over the total number of shares in issue
Stock return volatility	VOL	The standard deviation of a firm's daily stock returns during a year
Tangibility	TANG	The net fixed assets plus inventory over total assets
Tobin's Q	Q	The sum of the market value of equity and book value of debt, scaled by the book value of assets

Appendix 2. Weighted average churn rate (following Gaspar et al. (2005))

Following Gaspar et al. (2005), we calculate the churn rate of the stock ownership by a mutual fund f during a quarter, q, $CR_{t,q}$. It is expressed as follows:

$$CR_{f,q} = \frac{\sum_{i=1}^{N_{f,q}} \left| S_{i,f,q} P_{i,q} - S_{i,f,q-1} P_{i,q-1} - S_{i,f,q-1} \Delta P_{i,q} \right|}{\sum_{i=1}^{N_{f,q}} \left(S_{i,f,q} P_{i,q} + S_{i,f,q-1} P_{i,q-1} \right)/2} \quad \text{(A1)}$$

where $S_{i,f,q}$ is the number of shares of firm i held by fund f in quarter q, $P_{i,q}$ is the stock price of firm i, and $N_{f,q}$ is the number of firms held by fund f. The churn rate measures how frequently a mutual fund changes the position in a single stock in the portfolio during a quarter.

Since $\Delta P_{i,q} = P_{i,q} - P_{i,q-1}$, we can rewrite Eq. (A1) as follows:

$$CR_{f,q} = \frac{\sum_{i=1}^{N_{f,q}} \left| S_{i,f,q} P_{i,q} - S_{i,f,q-1} P_{i,q} \right|}{\sum_{i=1}^{N_{f,q}} \left(S_{i,f,q} P_{i,q} + S_{i,f,q-1} P_{i,q-1} \right)/2} \quad \text{(A2)}$$

The item inside the absolute value sign of Eq. (A2) is the variation in the ownership of firm i held by mutual fund f in a quarter where ownership is measured by firm i's market value. The numerator as a whole is the sum of the absolute variation in values of all firms that are invested by fund f during quarter q. The denominator is the sum of the average market value of shares held by fund f. Therefore, $CR_{f,q}$ measures the percentage change of the market value of shares held by mutual fund f during quarter q. This definition of CR is standard and it "follows those commonly used to assess overall portfolio rotation" (Gaspar et al., 2005, p. 143).

The annual average churn rate of fund f in year t, $ACR_{f,t}$, is the average of quarterly churn rates, $CR_{f,q}$, during a year. The weighted average churn rate of the ownership of all mutual funds for firm i in year t, $WACR_{i,t}$, is given by:

$$WACR_{i,t} = \sum_{f=1}^{M_{i,t}} w_{i,f,t} ACR_{f,t} \quad \text{(A3)}$$

where $w_{i,f,t}$ is proportion of shares of firm i held by fund f in year t, and $M_{i,t}$ is the number of mutual fund investors of firm i. $WACR_{i,t}$ is used to measure mutual funds turnover of firm i.

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