

# D&O Insurance and Corporate Investment Efficiency<sup>\*</sup>

Xinyuan Chen, Kai Zhu, and Nan Li<sup>1</sup>

Received 29<sup>th</sup> of May 2014 Accepted 1<sup>st</sup> of June 2015

© The Author(s) 2015. This article is published with open access by The Hong Kong Polytechnic University

## Abstract

This paper investigates the effect of directors and officers liability insurance (D&O insurance) on firm investment behaviour. Under the Chinese institutional environment, we analyse the relationship between D&O insurance and firms' capital expenditure decisions. We find that compared with firms without D&O insurance, firms with D&O insurance will invest more with free cash flow and that their investment efficiency decreases. We get the same findings when we compare the investment behaviour of the same company between a period with D&O insurance and a period without D&O insurance. Our findings imply that improving the effect of D&O insurance on corporate governance should rely on the development of minority shareholder protection under the existing institutional environment.

**Keywords:** D&O Insurance, Overinvestment, Investment Efficiency

**CLC codes:** F0, F27, F832

---

\* Our paper constitutes part of a National Natural Science Foundation research project entitled "The performance assessment system of state-owned enterprises: Reform and its economic consequences". It has been supported by the MOE's Project of Key Research Institutes of Humanities and Social Sciences in Universities (11JJD790008, 14JJD630005) and funded by the Program of Shanghai Municipal Education Commission (2014111143) and Project 211 of Shanghai University of Finance and Economics. We would like to thank the editors and two anonymous reviewers for their helpful comments. We take full responsibility for this article.

<sup>1</sup> Corresponding author: Kai Zhu, Research Institute of Accounting and Finance, Shanghai University of Finance and Economics, China; e-mail address: aczhuk@mail.shufe.edu.cn. The same affiliation is shared by the first and third authors.

## I. Introduction

This paper investigates the effect of directors and officers liability insurance (D&O insurance) on firm investment behaviour under the Chinese institutional environment. According to the definition of the Chartered Insurance Institute (CII), D&O insurance is a special type of insurance, which can provide financial protection for directors and officers when they face lawsuits or financial liability.

Although the purchase of D&O insurance first appeared in England in 1930, it was very uncommon in the US capital market until the 1960s. Currently, more than 90% of US large companies purchase D&O insurance. In China, however, despite encouragement from the government and exchanges, most companies show no interest in buying it. Since 2002, the year that Ping An Insurance sold the first D&O insurance in China, only 3% of Chinese listed companies have bought this type of insurance. D&O insurance is considered to be the “best game that no one played” in China (Wang, 2009), and there is controversy about its influence on corporate governance and firm value among researchers.

To date, the focus of academic research has been on the determinants for purchasing D&O insurance and the economic consequences of D&O insurance. The findings can be summarised in the three hypotheses as follows:

1. Corporate governance: The purchase of D&O insurance reflects the situation of corporate governance; companies with worse corporate governance may tend to buy D&O insurance (Zou *et al.*, 2008) and pay higher rates (Core, 1997, 2000). O’Sullivan (1997) showed that D&O insurance could be an effective mechanism for enhancing corporate governance and found that companies with a more independent board would purchase more D&O insurance. D&O insurance also offers the “last chance” for protecting investors from directors’ wrong decisions.

2. Managerial opportunism: Firm directors may take advantage of private information to buy D&O insurance in advance to lower the potential litigation risk caused by a decrease in future performance (Chalmers *et al.*, 2002) or to increase their own compensation (Kang, 2011).

3. Moral hazard: D&O insurance shields directors and officers from lawsuits brought by shareholders, thereby leading to low financial conservatism (Chung and Wynn, 2008), higher acquisition premiums, and worse synergies expected by the market (Lin *et al.*, 2011).

This paper discusses the impact of D&O insurance on the association between corporate investment decisions and corporate value under the Chinese institutional environment. The evidence supports the notion that the provision of D&O insurance can induce higher agency costs, especially in China (with poor shareholder protection), by shielding directors and officers from litigation launched by shareholders. Using a sample of listed companies in China, we examine the impact of D&O insurance on companies’

investment activities from both the time-series and cross-sectional perspectives. The findings show that when companies have purchased D&O insurance, they tend to overinvest using their free cash flows and the efficiency of their overall investments decreases. The results support our hypothesis that D&O insurance increases Chinese listed companies' agency costs.

Our paper offers a new view for testing D&O insurance and its consequences under the Chinese institutional environment. We compare the investment behaviour of the same company before and after taking out D&O insurance, providing proof for estimating the economic consequences for listed companies with D&O insurance. In China, D&O insurance does not play an effective role in corporate governance and protecting minority investors; on the contrary, it worsens the agency problem. This suggests that the necessity for D&O insurance provision should be more carefully discussed.

The remainder of the paper is organised as follows. In Section II, we briefly review D&O insurance and provide the theoretical analysis. We describe our data in Section III and report our empirical results in Sections IV. Section V concludes the paper.

## **II. Institutions and Theoretical Analysis**

### **2.1 A Review of D&O Insurance**

As the modern enterprise system develops, directors and senior managers are playing a core role in corporate governance, and the effect of the executive agency problem on shareholder value has become an issue of common concern among academics and practitioners. Policies and regulations have been launched to increase the legal responsibility of directors and executives in order to protect the interests of investors. However, a company's business process is always facing a variety of market risks, and it is difficult for executives to avoid errors or the losses caused by changes in the market environment. When directors and executives face litigation due to their operational mistakes, they not only have to take the time and bear the litigation costs, but also to pay the potential high damages. Therefore, when formulating the relevant laws, the government has to consider how to overcome the negative influence caused by lawsuits so as to ensure that directors feel assured about serving the company, and how to strengthen the responsibility of executives.

The enforcement of D&O insurance varies in different countries. Although D&O insurance is very common for listed companies in common law jurisdictions (such as the US), civil law jurisdictions consider that D&O insurance should be prohibited to ensure that directors make rational decisions, exercise caution, and maintain moral standards when they perform their duties. Therefore, there is still an on-going debate on the influence of D&O insurance, especially about protecting and motivating directors and officers for firm value

promotion.

It has been more than 80 years since D&O insurance first emerged, and it is now very common in Western capital markets. Up to the end of 1998, 92% of American listed companies and 84% of Canadian listed companies had purchased D&O insurance. However, related empirical research has only appeared during the last 20 years because before the 1990s, companies did not disclose data and information about taking out D&O insurance. Since the 1990s, firms in the UK and Canada have been required to disclose their means and tools of risk management, thus making research on the impact of D&O insurance possible.

Related studies about D&O insurance mainly focus on whether it would affect a company's decisions and their related economic consequences. Holderness (1990) points out that D&O insurance can lower litigation risk and improve corporate governance because the insurance company would provide supervision in the process of evaluating the potential risk. Core (1997, 2000), O'Sullivan (1997), and Kang (2011) also support Holderness's (1990) view. They find a negative relation between the premium for D&O insurance and the corporate governance effective index. Zou *et al.* (2008) find that purchase of D&O insurance in China is related to governance issues generated by the conflict of interests between controlling and minority shareholders and that directors would tend to pay more premiums for D&O insurance if they face severer monitoring from independent directors. Boyer (2014) considers that D&O insurance can cover the loss caused by executives' mistakes, thus protecting the interests of investors.

Other evidence shows that the purchase of D&O insurance may induce executives to take advantage of their own private information (managerial opportunism) to implement aggressive financial strategies to their own advantage. Chalmers *et al.* (2002) find a negative relation between the purchase of D&O insurance and stocks returns of initial public offerings (IPOs), supporting managerial opportunism. The premiums for D&O insurance may not constitute part of the monitoring service because these could just reflect the extent of litigation risk dispersion (Baker and Griffith, 2007). Chung and Wynn (2008) find that D&O insurance shields directors and officers from lawsuits brought by shareholders and others, thus leading to low financial conservatism. Lin *et al.* (2011) find that companies taking out D&O insurance will pay a higher acquisition premium. Lin *et al.* (2013) note that a higher level of D&O insurance coverage could be associated with greater risk taking by the company and higher spreads charged on bank loans.

## 2.2 Institutions and Hypotheses

The China Securities Regulatory Commission (CSRC) promulgated the *Code of Corporate Governance for Listed Companies in China* in 2002, Article 39 of which clearly states that a listed company may purchase liability insurance for directors subject to approval at the shareholders' meeting. As the revised *Company Law* and *Securities Law*

have emphasised and stipulated the civil liability of directors and executives, the litigation risk for a company's executives is significantly increased. The Vice Chairman of the China Insurance Regulatory Commission (CIRC), Yanli Zhou, said in 2007 that D&O insurance protected not only the interests of directors but also those of minority shareholders by ensuring full compensation for legitimate claims against directors and executives of listed companies.

Although the mechanism of investor protection in China is still in the process of improvement, executives are facing an increasingly significant civil litigation risk. In 2008, the ultimate controller and the chairman of ZOJE Sewing Machine Company were sued by investors for misrepresentations. Despite the fact that the plaintiffs abandoned the claim against the chairman in the final settlement, this litigation marked the beginning of listed companies' executives becoming the object of litigation in China.

In practice, only 3% of Chinese listed companies have bought D&O insurance since 2002, the year that Ping An Insurance sold the first D&O insurance in China, although mainly to firms listed overseas. This phenomenon shows that D&O insurance is still in its infancy in China, and so there is little evidence about its influence on promoting corporate governance and the development of the capital market. As a special kind of insurance, D&O insurance may help to disperse the potential litigation risk borne by executives; however, it inevitably has the problem of moral hazards (Arrow, 1963; Holmstrom, 1979). Unlike the classical moral hazard issue, any changes in executives' decision-making behaviour not only affect the earnings and risk levels of the insurance company but also the investment decisions of the company and the interests of shareholders after taking out D&O insurance.

In companies that do not purchase D&O insurance, executives may not be willing to bear a high litigation risk due to personal wealth restraints and thus may abandon some high-risk projects that can promote firm value, thus leading to underinvestment (Myers and Majluf, 1984; Fazzari *et al.*, 1988). The purchase of D&O insurance can lower directors' anticipation of risk, inducing them to accept higher-risk projects that can promote firm value. In addition, if a company does not buy D&O insurance, directors may restrain investment actions and refrain from investing in high-risk projects due to the risk of future litigation. According to the agency theory, D&O insurance could shield directors and officers from assuming liability resulting from investment mistakes, and thus their expected litigation risk decreases, which may induce them to overinvest not for the shareholders' interests but for private benefits (Baker and Griffith, 2007; Chung and Wynn, 2008; Lin *et al.*, 2011). To gain high returns, a company may also invest in high-risk projects that have a negative net present value using its free cash flow, and this will induce overinvestment and an increase in the agency cost. On the basis of the above analysis, we hypothesise as follows:

**H1: The correlation between overinvestment and free cash flow is higher in**

**companies with D&O insurance.**

On the other hand, testing the relation between investment and shareholder value from the market perspective (that is, testing shareholders' anticipation of the company's purchase of D&O insurance) is also important for measuring the economic consequences of D&O insurance. Since D&O insurance disperses the risk borne by senior management, they may engage in overinvestment for their own interests, thus lowering the efficiency of investment and firm value. This kind of behaviour increases the agency cost of the company (Jensen, 1986). Although shareholders can charge the payment from directors and officers afterwards, this *ex post* action may not be able to restrain directors' agency behaviour effectively in advance; in other words, this is a corporate governance mechanism with low efficiency (Jensen, 1993; Richardson, 2006). If investors rationally anticipate that this situation would happen in the company, they will lower their expectation regarding firm value. As a result, the correlation between firm investment and stock prices is lowered, which means that the correlation between corporate investment and firm value is lowered. On the basis of the above analysis, we propose the second hypothesis:

**H2: The correlation between overinvestment and investment value is lower in companies with D&O insurance.**

### III. Sample Selection and Research Design

#### 3.1 Sample Selection

We select non-financial listed companies for the period between 2002 and 2012 as our sample and exclude companies with the following properties: (1) missing data on total assets; (2) negative or missing data on sales revenue; (3) negative shareholders' equity; (4) shares listed in the year; (5) shares traded for less than 10 months in the year; (6) yearly industry sample observations less than 30; (7) missing relevant financial indicators. There are 13,338 observations from 1,989 listed companies, and the mean duration is 6.7 years.

We hand collect annual reports, announcements of shareholders' general meetings, and announcements of boards of directors to find out whether the company has purchased D&O insurance in the year. Finally, we confirm that 109 listed companies purchased D&O insurance during different periods.<sup>2</sup> The total number of firm-year observations is 188, accounting for 1.41% of the total sample (13,338), which is slightly lower than previous

---

<sup>2</sup> For example, Vanke (stock code: 000002) disclosed information about D&O insurance in its annual reports of 2004 and 2005. However, from 2006 onwards, it did not include D&O insurance in the agendas of shareholders' general meetings and did not disclose whether it purchased D&O insurance in its annual reports. Therefore, we assume that Vanke did not purchase D&O insurance in other financial years.

statistics (Wang, 2009); the main reason for this is that in this paper, financial listed companies, most of which purchase D&O insurance, are excluded. Except for the D&O insurance data, which are hand collected, other financial and stock price data are taken from the China Stock Market and Accounting Research (CSMAR) database.

## 3.2 Research Design and Variable Definitions

### 3.2.1 Model of factors affecting a company's investment decisions

According to the hypotheses, D&O insurance affects not only a company's investment decision-making but also the value relevance of its investment decisions. To test Hypothesis 1, we test the relation between free cash flow and the overinvestment of companies which have purchased D&O insurance on the basis of Richardson's (2006) model.<sup>3</sup> In this paper, we regress the following models by industry and year to obtain a forecast value for a company's expected investment level (*ECAPX*).

$$\begin{aligned} CAPX_t = & a + b_1CASH_{t-1} + b_2LEV_{t-1} + b_3OCF_{t-1} + b_4SLG_t \\ & + b_5MV_{t-1} + b_6TQ_{t-1} + b_7CAPX_{t-1} + \varepsilon \end{aligned} \quad (1-1)$$

On the basis of model 1-1, we test the relation between free cash flow and overinvestment using the following model:

$$DCAPX = \alpha' + \beta'_1DO + \beta'_2FCF + \beta'_3DO * FCF + \varepsilon \quad (1-2)$$

*CAPX* represents net capital expenditure, which is measured by cash paid to acquire fixed assets, intangible assets, and other long-term assets + cash paid to acquire subsidiaries – cash received from the disposal of fixed assets, intangible assets, and other long-term assets – cash received from the disposal of subsidiaries – fixed-asset depreciation – intangible asset amortisation – other long-term asset amortisation. *DO* is a dummy variable which takes the value of 1 to indicate that a company has purchased D&O insurance and 0 otherwise. *DCAPX* represents the level of overinvestment, which is the difference between *CAPX* and *ECAPX*. When *DCAPX* is larger than 0, it indicates overinvestment; when *DCAPX* is less than 0, it indicates underinvestment. *CASH* represents the level of cash and cash equivalents. *LEV* represents the level of debt with interest. *SLG* represents the revenue growth rate; we do not use the Tobin's Q ratio to measure revenue growth rate because Tobin's Q itself has many meanings as it can indicate growth and profitability as well as investment efficiency. As we focus on the extent of the growth in revenue, we calculate it

<sup>3</sup> Researchers (Li, 2007; Liu, 2006; Hao *et al.*, 2007; Xu and Zhang, 2009; Wei and Liu, 2007) have examined the impact of agency behaviour on overinvestment from different perspectives following the model of Richardson (2006). Their results prove that Richardson's model is applicable in the Chinese setting.

directly.  $FCF$  represents the level of free cash flow, which is the difference between operating cash flow ( $OCF$ ) and  $ECAPX$ . According to Richardson (2006), when  $DCAPX$  is larger than 0, and if  $\beta'_2$  is significantly positive, the higher the free cash flow, the more serious the overinvestment of the company. In model 1-2, if  $\beta'_2$  and  $\beta'_3$  are significantly positive, it means that purchasing D&O insurance has significantly increased the relation between free cash flow and overinvestment.

### 3.2.2 Model of investment value relevance

In this paper, we use the model of Wan *et al.* (2012) as the basis for examining the effect of purchasing D&O insurance on investment efficiency by testing the relation between stock returns and investment. The model is as follows:

$$RET_t = \gamma + \delta_1 DO_t + \delta_2 CAPX_t + \delta_3 DO_t * CAPX_t + \delta_4 OCF_t + \delta_5 DO_t * FCF_t + \delta_6 MV_{t-1} + \delta_7 BM_{t-1} + \delta_8 LEV_{t-1} + \varepsilon \quad (2)$$

$RET$  is annual stock returns.  $CAPX$  is the level of investment in Model 1. If the purchase of D&O insurance is able to reduce management's risk expectation and encourage investment,  $\delta_3$  would be significantly positive in Model 2. However, if the purchase of D&O insurance causes overinvestment by companies,  $\delta_3$  would be significantly negative in Model 2. In the test, we divide  $CAPX$  further into  $ECAPX$  and  $DCAPX$  and test the effect of purchasing D&O insurance on the value relevance of investment expectation and overinvestment.

The control variables in Model 2 are as follows:  $MV$  measured by the natural logarithm of market value of tradable shares;  $BM$  measured by the book-to-market ratio;  $LEV$  measured by the ratio of debt with interest (the sum of short-term loans, long-term loans due within one year, long-term loans, and bonds payable) to market value of tradable shares.

All the continuous variables (excluding  $RET$ ,  $SLG$ ,  $MV$ ,  $TQ$ , and  $BM$ ) in this paper are divided by the market value of tradable shares at the end of the previous year to control for the effect of size effect and ensure the comparability of these measures. To control for extreme values, all the continuous variables in this paper are winsorised at the top and bottom 1%, two-tailed.

### 3.2.3 Research methods

To control for potential endogeneity, we adopt cross-sectional and time-series comparison to test the regression models mentioned above. The cross-sectional comparison includes all samples, but it is hard to effectively control for differences in company characteristics between cross sections. The time-series comparison focuses on analysing 109 companies that have purchased D&O insurance (there are 1,015 observations in total), and



we also analyse and compare the differences in company investment and investment efficiency before and after purchasing D&O insurance to control for the potential effects of unobservable company characteristics on the conclusions of this paper. Meanwhile, we adopt the method of paired samples to test the regression models mentioned above, setting the research periods as one year before and one year after purchasing D&O insurance and one year before and two years after purchasing D&O insurance and using companies of similar condition in the same industries but without D&O insurance as the matched sample.

**Table 1 Variable Definitions**

Variable	Definition
Insurance:	
<i>DO</i>	Dummy variable equal to 1 if the firm purchases D&O insurance in the fiscal year and 0 otherwise.
Company characteristics:	
<i>CAPX</i>	Net capital expenditure divided by total assets (cash paid to acquire fixed assets, intangible assets, and other long-term assets + cash paid to acquire subsidiaries – cash received from the disposal of fixed assets, intangible assets, and other long-term assets – cash received from the disposal of subsidiaries – fixed-asset depreciation – intangible asset amortisation – other long-term asset amortisation) divided by market value of tradable shares at the end of the previous year
<i>ECAPX</i>	The regressed expected value of Model 1-1 after regressing by industry and year
<i>DCAPX</i>	The level of overinvestment = $(CAPX - ECAPX) /$ market value of tradable shares at the end of the previous year; if <i>DCAPX</i> is bigger than 0, it indicates overinvestment; if <i>DCAPX</i> is less than 0, it indicates underinvestment.
<i>FCF</i>	$(OCF - ECAPX) /$ market value of tradable shares at the end of the previous year
<i>CASH</i>	The sum of cash and cash equivalents / market value of tradable shares at the end of the previous year
<i>LEV</i>	The level of debt with interest / market value of tradable shares at the end of the previous year
<i>SLG</i>	The growth rate of revenue = $(\text{revenue of current year} - \text{revenue of the previous year}) / \text{revenue of the previous year}$
<i>RET</i>	Annual stock returns
<i>MV</i>	The natural logarithm of market value of tradable shares.
<i>BM</i>	Book-to-market ratio = book value of equity per share / price per share
<i>TQ</i>	Before 2007, <i>TQ</i> = $(\text{market value of tradable shares} + \text{market value of non-tradable shares} * 0.7 + \text{total assets} - \text{owners' equity}) / \text{total assets}$ ; from 2007 onwards, <i>TQ</i> = $(\text{market value of tradable shares} + \text{total assets} - \text{owners' equity}) / \text{total assets}$

## IV. Empirical Test and Analysis

### 4.1 Descriptive Statistics and Correlation Analysis

Table 2 presents the distribution of the sample by industry. The industries are classified in accordance with the *Guidelines for the Industry Classification of Listed Companies* issued by the China Securities Regulatory Commission (CSRC). There are 18 industries in total,<sup>4</sup> the manufacturing industry uses the two-digit code, and non-manufacturing industries use the one-digit code. As shown in Table 2, D&O insurance is taken out by companies in all of the industries except for agriculture, forestry, animal husbandry, fishery, and construction. The transportation and warehousing industry has the highest number and proportion of companies purchasing D&O insurance (25 companies, accounting for 4.18% of the industry sample (573)), followed by the petrochemical industry (19 companies, accounting for 1.22% of the industry sample (1,541)). The results in Table 2 show that systematic differences between industries do not result in companies with D&O insurance being concentrated in specific industries.

**Table 2 Distribution of the Sample by Industry**

Industry	No. of companies with D&O insurance	No. of companies without D&O insurance	Proportion of companies with D&O insurance
Agriculture, forestry, animal husbandry, and fishery	0	34	0.00%
Mining	2	159	1.24%
Food and beverage	8	644	1.23%
Textile, garment, and fur	5	513	0.97%
Papermaking and printing	3	91	3.19%
Petrochemicals and plastics	19	1,541	1.22%
Electronics	13	541	2.35%
Metals and non-metals	13	1,258	1.02%
Machinery and equipment	18	2,406	0.74%
Pharmaceutical and biological products	10	888	1.11%
Electricity, gas and water production and supply	9	636	1.40%
Construction	0	64	0.00%
Transportation and warehousing	25	573	4.18%
Information technology	12	735	1.61%
Wholesale and retail	16	1,026	1.54%
Real estate	13	1,058	1.21%
Social services	9	399	2.21%
Others	13	584	2.18%
<b>Total</b>	<b>188</b>	<b>13,150</b>	<b>1.41%</b>

<sup>4</sup> Our results do not change after excluding samples in the agriculture, forestry, animal husbandry, fisheries, and construction industries.

Table 3 lists the descriptive statistics of the full sample and the sample of companies with D&O insurance. As shown in Table 3, observations with D&O insurance (*DO*) account for 1.4% of the full sample. Out of the listed companies with D&O insurance (1,015), 18% clearly disclose their purchase of D&O insurance in a given year, indicating that the number of years affected by D&O insurance is relatively small.

A listed company may take out long-term D&O insurance in a given year but no longer disclose it in subsequent years. This could be the reason for the relatively low statistical results in Table 3. According to the data collected manually, all of the D&O insurance disclosed is taken for one year of coverage, with the minimum premium rate at 0.19%, and the maximum insured amount is RMB315 million. On the other hand, if a company purchases long-term D&O insurance but does not disclose it, it is possible that we could mistake periods covered by D&O insurance for periods not covered by D&O insurance. If the coefficients on *DO* are significantly different from zero, then such a classification error may undermine the impact of *DO*; in other words, if the insurance coverage periods can be more effectively measured, the regression results will be more significant than those reported.

**Table 3 Descriptive Statistics**

<b>Full sample</b>						
<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Minimum</b>	<b>Median</b>	<b>Maximum</b>
<i>DO</i>	13338	0.014	0.118	0.000	0.000	1.000
<i>CAPX</i>	13338	0.073	0.201	-0.312	0.017	1.196
<i>DCAPX</i>	13338	0.000	0.132	-0.384	-0.010	0.566
<i>ECAPX</i>	13338	0.072	0.136	-0.394	0.040	1.377
<i>FCF</i>	13338	0.059	0.273	-0.746	0.025	1.369
<i>CASH</i>	13338	0.337	0.372	0.005	0.214	2.185
<i>LEV</i>	13338	0.244	0.166	0.000	0.238	0.657
<i>SLG</i>	13338	0.224	0.545	-0.678	0.140	3.821
<i>RET</i>	13338	0.267	0.884	-0.749	-0.061	3.724
<i>MV</i>	13338	7.269	1.186	4.023	7.150	14.410
<i>BM</i>	13338	0.986	0.864	0.066	0.725	4.905
<i>TQ</i>	13338	2.038	1.336	0.810	1.585	8.788
<b>Sample with D&amp;O insurance</b>						
<i>DO</i>	1015	0.185	0.389	0.000	0.000	1.000
<i>CAPX</i>	1015	0.107	0.271	-0.312	0.023	1.196
<i>DCAPX</i>	1015	0.005	0.145	-0.384	-0.010	0.566
<i>ECAPX</i>	1015	0.102	0.195	-0.213	0.040	1.234
<i>FCF</i>	1015	0.121	0.368	-0.746	0.051	1.369
<i>CASH</i>	1015	0.408	0.451	0.005	0.251	2.185
<i>LEV</i>	1015	0.264	0.163	0.000	0.259	0.657
<i>SLG</i>	1015	0.206	0.436	-0.678	0.146	3.821
<i>RET</i>	1015	0.258	0.865	-0.749	-0.059	3.724
<i>MV</i>	1015	7.636	1.332	4.643	7.485	12.209
<i>BM</i>	1015	1.158	1.062	0.066	0.859	4.905
<i>TQ</i>	1015	1.830	1.143	0.810	1.432	8.788

Table 4 Pearson Correlation of Model 1

	CAPX	DO	DCAPX	FCF	CASH	LEV	SLG	RET	MV	BM	TQ
CAPX	1.000										
DO	0.029***	1.000									
DCAPX	0.741***	0.008	1.000								
FCF	0.021**	0.026***	0.118***	1.000							
CASH	0.131***	0.076***	0.030***	0.091***	1.000						
LEV	0.197***	0.019**	0.084***	-0.062***	0.008	1.000					
SLG	0.090***	0.004	0.009	0.023***	0.056***	0.006	1.000				
RET	0.075***	-0.006	0.022**	0.152***	-0.004	-0.031***	0.090***	1.000			
MV	0.019**	0.040***	0.031***	-0.087***	0.555***	-0.022**	-0.001	-0.238***	1.000		
BM	0.228***	0.016*	0.028***	0.205***	0.094***	0.056***	-0.011	-0.288***	-0.212***	1.000	
TQ	-0.121***	-0.015*	-0.029***	-0.052***	-0.115***	-0.281***	0.056***	0.402***	0.034***	-0.492***	1.000

Table 5 Pearson Correlation of Model 2

	RET	DO	CAPX	DCAPX	ECAPX	FCF	MV	BM <sub>t-1</sub>	LEV <sub>t-1</sub>
RET	1.000								
DO	-0.006	1.000							
CAPX	0.075***	0.029***	1.000						
DCAPX	0.022**	0.008	0.741***	1.000					
ECAPX	0.089***	0.035***	0.761***	0.129***	1.000				
FCF	0.152***	0.026***	0.021**	0.118***	-0.083***	1.000			
MV	-0.238***	0.040***	0.019**	0.031***	-0.002	-0.087***	1.000		
BM <sub>t-1</sub>	0.217***	0.026***	0.267***	0.028***	0.386***	0.333***	-0.363***	1.000	
LEV <sub>t-1</sub>	0.017**	0.016*	0.108***	0.010	0.151***	0.069***	-0.047***	0.047***	1.000

In Table 3, compared with the full sample, firms with D&O insurance have a higher market value ( $MV$ ) (on average, RMB6.31 billion). In respect of financial indicators, firms with D&O insurance have a higher proportion of cash (0.408), a higher debt ratio (0.264), and a lower rate of revenue growth (0.206), indicating that these companies experience relatively low growth, as reflected in their higher book-to-market ratios (mean  $BM$  is 1.158).

Firms with D&O insurance have higher free cash flow ( $FCF$ ) (0.121), indicating that although the level of profitability for such companies is higher, the problem with free cash flow is also more serious; the investment proportion of such companies is higher (mean  $CAPX$  is 0.107), as is the level of overinvestment (mean  $DCAPX$  is 0.005).

Tables 4 and 5 show the results of correlation coefficients on variables. In Table 4, the correlation coefficient between overinvestment ( $DCAPX$ ) and free cash flow ( $FCF$ ) is significantly positive, indicating that companies use free cash flow to invest excessively and have serious agency problems (Jensen, 1986). In Table 5, the correlation coefficients between investment ( $CAPX$ ) (including overinvestment ( $DCAPX$ ) and expected investment size ( $ECAPX$ )) and annual stock returns ( $RET$ ) are positive, indicating that fixed investment can enhance investment efficiency for the full sample. The correlation coefficient between annual stock returns ( $RET$ ) and  $MV$  is significantly negative, indicating that companies with a larger market capitalisation provide lower stock returns.

## 4.2 Empirical Results and Analysis

In this section, we follow the overinvestment model of Richardson (2006) to examine whether there is higher correlation between overinvestment and free cash flow for firms with D&O insurance. The corresponding results are presented in Table 6.

**Table 6 Regression Results for Model 1-2 (Dependent variable:  $DCAPX$ )**

	Full sample				Firms with D&O insurance			
	$DCAPX>0$		$DCAPX<0$		$DCAPX>0$		$DCAPX<0$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.088*** (5.017)	0.088*** (5.052)	-0.050*** (-5.301)	-0.050*** (-5.301)	0.240* (1.833)	0.246* (1.951)	-0.033* (-1.804)	-0.032* (-1.729)
$DO$	0.017 (1.239)	0.005 (0.443)	-0.005 (-0.789)	-0.005 (-0.651)	0.024 (1.561)	0.010 (0.721)	-0.004 (-0.550)	-0.008 (-0.944)
$FCF$	0.055*** (6.527)	0.051*** (6.005)	0.001 (0.187)	0.001 (0.198)	0.073*** (3.597)	0.050** (2.262)	-0.029** (-2.018)	-0.037** (-2.111)
$DO*FCF$		0.108** (2.482)		-0.003 (-0.152)		0.110** (2.391)		0.033 (1.274)
$INDUSTRY$	control	control	Control	control	control	control	control	control
$YEAR$	Control	control	Control	control	control	control	control	control
N	5594	5594	7744	7744	438	438	577	577
Adjusted R <sup>2</sup>	0.168	0.170	0.206	0.206	0.296	0.311	0.213	0.215
F value	29.880	29.241	54.656	52.852	6.452	6.914	5.192	5.049

Note: t-values in parentheses; \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Standard errors in Table 6 are clustered at the firm level. Columns 1 to 4 show the results for the full sample and columns 5 to 8 show those for listed firms with D&O insurance. We define “firms with D&O insurance” as firms that bought D&O insurance in the observation period. If a firm bought D&O insurance in a given period,  $DO$  takes the value of 1 for that period and 0 for other periods. According to Richardson (2006), given that  $DCAPX$  is greater than 0, if the regression coefficient on  $FCF$  is significantly positive, it indicates that the company overinvests with its free cash flow and has serious agency problems (Jensen, 1986). Therefore, in Table 6, we further divide the sample into two subsamples according to whether  $DCAPX$  is greater than 0 and run the regressions separately.

As can be seen from the firms with D&O insurance in Table 6, the coefficients on  $DO$  are positive but not significant, while the coefficients on  $FCF$  are significantly positive, suggesting that free cash flow leads more easily to firm overinvestment, consistent with the finding of Richardson (2006). There is a positive and significant relation between free cash flow and overinvestment, which means that the purchase of D&O insurance increases the agency cost of companies (coefficients on  $DO*FCF$  are positive at the 5% level). This conclusion holds for both the full sample and the sample of firms with D&O insurance. However, the coefficients on  $DO*FCF$  are not significant if  $DCAPX$  is less than 0, indicating that the purchase of D&O insurance does not change the correlation between underinvestment and free cash flow.

Table 7 shows the regression results for Model (2), which examines the correlation between firm investment decisions and stock returns.

Standard errors in Table 7 are clustered at the firm level. Columns 1 and 2 show the results for the full sample and columns 3 and 4 those for listed firms with D&O insurance. The definitions for firms with D&O insurance and  $DO$  are consistent with those used in Table 6. In columns 1 and 3, net capital expenditure ( $CAPX$ ) is used as the key independent variable, while in columns 2 and 4 we separate net capital expenditure ( $CAPX$ ) into overinvestment ( $DCAPX$ ) and expected capital expenditure ( $ECAPX$ ) as key independent variables. All the results for the independent variables are largely consistent with our hypotheses; in other words, the results are not affected by sample selection and model setting.

The coefficients on  $DO$  are positive but not significant, while the coefficients on the capital expenditure ( $CAPX$ ) measures are positive at the 1% level for both the full sample and the D&O insurance sample, showing a positive impact of fixed asset investment on shareholder value, which means that on average, corporate investment is efficient and can enhance firm value. For the full sample, the coefficients on overinvestment ( $DCAPX$ ) and expected capital expenditure ( $ECAPX$ ) are both significantly positive at the 5% and 1% levels, respectively. For firms with D&O insurance, the coefficients on  $DCAPX$  and  $ECAPX$

are positive but not significant.

**Table 7 Regression Results for Model 2 (Dependent variable: *RET*)**

	Full sample		Firms with D&O insurance	
	(1)	(2)	(3)	(4)
Constant	0.833*** (7.587)	0.879*** (8.019)	0.455 (1.643)	0.471* (1.704)
$DO_t$	0.044 (1.357)	0.060 (1.623)	0.049 (1.276)	0.050 (1.170)
$CAPX_t$	0.164*** (5.439)		0.176*** (2.720)	
$DO_t * CAPX_t$	-0.440** (-2.484)		-0.376** (-2.206)	
$DCAPX_t$		0.088** (2.035)		0.180 (1.507)
$DO_t * DCAPX_t$		-0.443 (-1.509)		-0.543* (-1.784)
$ECAPX$		0.352*** (7.041)		0.233 (1.570)
$DO * ECAPX$		-0.663** (-2.552)		-0.430* (-1.719)
$FCF_t$	0.209*** (9.204)	0.237*** (9.543)	0.122* (1.766)	0.125* (1.696)
$DO_t * FCF_t$	0.116 (0.692)	0.116 (0.689)	0.236 (1.422)	0.248 (1.507)
$MV_{t-1}$	-0.052*** (-10.647)	-0.054*** (-11.166)	-0.034*** (-3.084)	-0.035*** (-3.142)
$BM_{t-1}$	-0.014* (-1.770)	-0.023*** (-2.848)	-0.025 (-1.129)	-0.026 (-1.039)
$LEV_{t-1}$	-0.059** (-2.289)	-0.071*** (-2.758)	-0.088 (-0.920)	-0.093 (-0.907)
<i>INDUSTRY</i>	control	Control	control	control
<i>YEAR</i>	control	Control	control	control
N	13338	13338	1015	1015
Adjusted R <sup>2</sup>	0.712	0.713	0.719	0.718
F value	779.06***	650.38***	72.60***	69.37***

Note: t-values in parentheses; \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

We examine the key independent variables  $DO * CAPX$  and  $DO * DCAPX$ . As shown in Table 7, the coefficients on  $DO * CAPX$  are negative and statistically significant at the 5% level for both samples. The coefficients on  $DO * DCAPX$  are significantly negative at the 10%

level. The coefficients on  $DO*ECAPX$  are also negative and statistically significant for the full sample (at the 5% level) and for firms with D&O insurance (at the 10% level). The above results suggest that the value relevance of the investment of firms with D&O insurance decreases; in other words, after taking out D&O insurance, executives are less sensitive to investment project returns due to a decrease in the expected litigation risk, and they are prone to accept high-risk projects which cannot enhance shareholders' benefits, thus lowering the overall efficiency of investment and the relation between investment and stock returns. The other coefficients on the control variables are consistent with our hypotheses. The coefficients on  $FCF$  are significantly positive, suggesting that firms with more free cash flow tend to provide more stock returns, but purchasing D&O insurance does not exert influence on the relation between free cash flow and shareholder value (coefficients on  $DO*FCF$  are not significant). The coefficients on  $MV$  are statistically significant and negative, suggesting a negative impact of large market capitalisation on stock returns. Except for columns 3 and 4, the coefficients on  $BM$  are significantly negative, indicating that Chinese stock investors favour high-growth firms. The coefficients on  $LEV$  are also significantly negative for the full sample, showing that firms with higher leverage provide lower stock returns.

Corporate investment may affect not only the current earnings but also the future earnings of a company, and so we also examine the relation between current corporate investment and stock returns for the following year ( $FRET$ ) and the impact of purchasing D&O insurance on this relation. However, the results suggest that the purchase of D&O insurance does not change the relation between investment and future stock prices.<sup>5</sup>

### 4.3 Robustness Tests

We use fixed-effect models at the firm level to examine the hypotheses. Firms with D&O insurance tend to put free cash flow into overinvestment, which lowers the value relevance of investment; this result is consistent with our hypotheses.

The endogenous model is not used because the current self-selection endogenous models (such as the Heckman model) just test the direct impact of residuals (or predicted value) at the first stage and do not control for the influence of self-selection on interaction terms. Therefore, we use the matching sample method to test the hypotheses.<sup>6</sup>

Tables 8 and 9 show the regression results using the matched sample. The observation periods include one year before and one year after (-1, +1) (column 1) and one year before

<sup>5</sup> We examine the correlation between current corporate investment and stock returns for the following year ( $FRET$ ) and find that the purchase of D&O insurance does not significantly affect the long-term value relevance of investment. The corresponding tables are not reported for brevity.

<sup>6</sup> Samples are matched mainly on the basis of annual total assets. Except for manufacturing, all industries are classified by one-digit codes; the manufacturing industry is classified by two-digit codes. There is no significant difference in total assets between the research sample and the matched sample. Thus, it is valid to use the matching sample method.



and two years after (-1, +2) (column 2) the point when firms purchased D&O insurance. Firms with D&O insurance are used as the research sample, while firms of a similar size in the same industries but without D&O insurance are used as the matched sample. We define *GAP* as the difference between the natural year and the year the firm purchased D&O insurance. *Diff\_RET*, *Diff\_FCF*, *Diff\_CAPX*, *Diff\_BM*, *Diff\_MV*, and *Diff\_LEV* represent differences in annual stock returns, free cash flow, net capital expenditure, book-to-market ratio, market value, and debt ratio between firms with D&O insurance and the matched sample, respectively. In Table 8, if *GAP\*Diff\_FCF* is significantly positive, it means that overinvestment has a significant relation with free cash flow. In Table 9, if *GAP\*Diff\_CAPX* is significantly negative, it means that overinvestment induces investors to lower their expectation for company earnings and the value relevance of investment decreases.

**Table 8 Robustness Tests for Hypothesis 1**

	(1)	(2)
	<i>Diff_CAPX</i>	<i>Diff_CAPX</i>
<i>GAP</i>	0.018 (1.192)	0.016 (0.959)
<i>Diff_FCF</i>	-0.220*** (-4.183)	-0.220*** (-3.527)
<i>GAP*Diff_FCF</i>	0.205*** (3.323)	0.152** (2.123)
Constant	0.005 (0.391)	0.005 (0.329)
N	195	257
Adjusted R <sup>2</sup>	0.072	0.050
F value	6.005***	5.471***

Note: t-values in parentheses; \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

As shown in Table 8, the coefficients on *Diff\_FCF* are negative and statistically significant at the 1% level, suggesting that firms with D&O insurance have less agency problems before the purchase of insurance compared with the matched firms and that their level of overinvestment induced by free cash flow is lower. The coefficients on *GAP\*Diff\_FCF* are significantly positive at the 1% level, suggesting that the correlation between overinvestment and free cash flow is higher after firms take out D&O insurance. In Table 9, the coefficients on *GAP\*Diff\_CAPX* are significantly negative, indicating that the purchase of D&O insurance lowers the value relevance of investment and the investment efficiency. All these results are consistent with the main test.

**Table 9 Robustness Tests for Hypothesis 2**

Variables	(1) <i>Diff_RET</i>	(2) <i>Diff_RET</i>
<i>Diff_CAPX</i>	1.826* (1.956)	1.674* (1.763)
<i>GAP</i>	0.179** (1.974)	0.168* (1.918)
<i>GAP*Diff_CAPX</i>	-3.290*** (-2.968)	-2.269** (-2.200)
<i>Diff_BM</i>	0.074 (0.554)	0.148 (1.258)
<i>Diff_FCF</i>	0.567 (1.525)	0.546 (1.429)
<i>GAP*Diff_FCF</i>	-0.441 (-1.036)	-0.427 (-0.997)
<i>Diff_LEV</i>	0.604** (2.556)	0.494** (2.398)
<i>Diff_MV</i>	-0.179** (-2.361)	-0.176*** (-2.710)
Constant	0.008 (0.112)	0.008 (0.105)
N	195	257
Adjusted R-squared	0.093	0.062
F value	3.489	3.106

Note: t-values in parentheses; \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

The method of matching samples has some limitations. An ideal matched sample is able to explain the reasons for choosing variables associated with purchasing D&O insurance, but we only use year, industry, and firm size as control variables. This method may not ensure that the potential influence of omitted variables on the conclusions is taken into account.

To sum up, under the current institutional environment in China, the purchase of D&O insurance may harm investment efficiency because executives may not focus on the investment value of projects due to a decrease in the expected litigation risk. Firms with D&O insurance usually engage in overinvestment, and as a result, the value relevance of investment decreases but the agency cost increases, thereby lowering the efficiency of corporate governance.

## V. Conclusions

Since D&O insurance is a special type of insurance, it can provide financial protection for companies and managers when facing lawsuits or financial liability. Currently, most of the listed companies in North America have taken out D&O insurance. Related research has explored the determinants of the price for D&O insurance, its correlation with corporate governance, and economic consequences such as the impact on financial decision-making. This paper is based on the Chinese institutional background and discusses the economic consequences after listed companies buy D&O insurance, especially the influence on corporate investment behaviour. Using samples of listed companies for the period between 2002 and 2012, it examines the impact of D&O insurance on companies' investment activities from the time-series and cross-sectional perspectives. The findings show that when companies have taken out D&O insurance, they tend to overinvest with their free cash flow and the efficiency of their overall investment decreases. Since D&O insurance leads to a reduction in managers' litigation risk and litigation costs, managers are more likely to make inefficient investment decisions that may harm company value. Given the current situation in China, D&O insurance does not play an effective role in corporate governance and in protecting minority investors: on the contrary, it worsens the agency problems.

This paper examines the impact of D&O insurance on the investment activities of companies and their value relevance under the Chinese institutional setting. Empirical studies show that D&O insurance leads to overinvestment, a decrease in investment efficiency, and an increase in agency costs. This paper provides empirical evidence for the necessity of promoting D&O insurance in China. Since D&O insurance is currently not capable of reducing the risk borne by management and enhancing investment efficiency, we should improve other mechanisms to protect minority investors while promoting D&O insurance in the Chinese market so that D&O insurance can really work to reduce management risk and promote efficient investment.

"Open Access. This article is distributed under the terms of the Creative Commons Attribution License which permits any use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited."

## References

- Arrow, K. J. (1963), 'Uncertainty and the Welfare Economics of Medical Care', *American Economic Review* 53 (5): 941-973.
- Baker, T. and Griffith, S. J. (2007), 'The Missing Monitor in Corporate Governance: The Directors' & Officers' Liability Insurer', *The Georgetown Law Journal* 95 (6):

1795-1842.

- Boyer, M. M. (2014), 'Directors' and Officers' Insurance and Shareholders' Protection', *Journal of Financial Perspectives* 2 (1): 107-128.
- Chalmers, J. M. R., Dann, L. Y., and Harford, J. (2002), 'Managerial Opportunism? Evidence From Directors' and Officers' Insurance Purchases', *The Journal of Finance* 57 (2): 609-636.
- Chen, Q., Chen, X., Schipper, K., Xu, Y., and Xue, J. (2012), 'The Sensitivity of Corporate Cash Holdings to Corporate Governance', *Review of Financial Studies* 25 (12): 3610-3644.
- Chung, H. H. and Wynn, J. P. (2008), 'Managerial Legal Liability Coverage and Earnings Conservatism', *Journal of Accounting and Economics* 46 (1): 135-153.
- Core, J. E. (1997), 'On the Corporate Demand for Directors' and Officers' Insurance', *The Journal of Risk and Insurance* 64 (1): 63-87.
- Core, J. E. (2000), 'The Directors' and Officers' Insurance Premium: An Outside Assessment of the Quality of Corporate Governance', *The Journal of Law, Economics, and Organization* 16 (2): 449-477.
- Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., and Poterba, J. M. (1988), 'Financing Constraints and Corporate Investment', *Brookings Papers On Economic Activity* 1: 141-206.
- Hao, Y. and Liu, X. (2011), 'Dagudong Zili Dongji Xia de Ziben Touzi yu Peizhi Xiaolu Yanjiu' (Study on Capital Investment and Allocation Efficiency under Large Shareholders' Self-Interest Motivation), *Chinese Journal of Management Science* 19 (1): 167-176.
- Hao, Y., Liu, X., and Wu, L. (2007), 'Jiyu Neiburen Xunzu de Niuquxing Guodu Touzi Xingwei Yanjiu' (Research on Distorted Overinvestment Behavior Based on Insider Rent-Seeking), *Journal of Systems Engineering* 22 (2): 128-133.
- Holderness, O. G. (1990), 'Liability insurers as corporate monitors', *International Review of Law and Economics* 10 (2): 115-129.
- Holmstrom, B. (1979), 'Moral Hazard and Observability', *Bell Journal of Economics* 10 (1): 74-91.
- Jensen, M C. (1986), 'Agency costs of free cash flow, corporate finance and takeovers', *American Economic Review* 76 (2): 323-329.
- Jensen, M. C. (1993), 'The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems', *Journal of Finance* 48 (3): 831-880.
- Jensen, M. C. and Meckling, W. H. (1976), 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics* 3 (4): 305-360.
- Kang, C. (2011), 'Directors' and Officers' Insurance: Ordinary Corporate Expense or

- Valuable Signaling Device?', Thesis, Department of Economics, Stanford University.
- Kaplan, S. N. and Zingales, L. (1997), 'Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?', *Quarterly Journal of Economics* 112 (1): 169-215.
- Li, X. (2007), 'Ziyou Xianjinliu, Xianjin Guli yu Zhongguo Shangshi Gongsi Guodu Touzi' (Free Cash Flow, Cash Dividend and Over-investment of Chinese Listed Companies), *Securities Market Herald*, Issue 10: 55-59.
- Lin, C., Officer, M., Wang, R., and Zou, H. (2013), 'Directors' and officers' liability insurance and loan spreads', *Journal of Financial Economics* 110 (1): 37-60.
- Lin, C., Officer, M., and Zou, H. (2011), 'Directors' and officers' liability insurance and acquisition outcomes', *Journal of Financial Economics* 102 (3): 507-525.
- Liu, C. (2006), 'Gongsi Zhili Jizhi, Ziyou Xianjin Liuliang yu Shangshi Gongsi Guodu Touzi Xingwei Yanjiu' (Research on Corporate Governance, Free Cash Flow, and Over-investment Behaviour of Listed Companies), *Economic Science*, Issue 4: 50-58.
- Myers, S. C. and Majluf, N. S. (1984), 'Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have', *Journal of Financial Economics* 13 (2): 187-221.
- O'Sullivan, N. (1997), 'Insuring the Agents: The Role of Directors' and Officers' Insurance in Corporate Governance', *The Journal of Risk and Insurance* 64 (3): 545-556.
- Richardson, S. (2006), 'Over-Investment of Free Cash Flow', *Review of Accounting Studies* 11 (2): 159-189.
- Wan, H., Chen, X., and Zhu, K. (2012), 'Shuizhi Gaige yu Gongsi Touzi Jiazhi Xiangguanxing' (Valuation of Corporate Capital Expenditure under Tax Reform), *Economic Research Journal*, Issue 3: 65-75.
- Wan, H. and Zhu, K. (2011), 'Is Investment-Cashflow Sensitivity a Good Measure of Financial Constraints?', *China Journal of Accounting Research* 4 (4): 253-270.
- Wang, X. (2009), 'Meiguo Dongshi yu Gaoguan Zeren Baoxian Zhidu Tanjiu ji Dui Woguo de Qishi' (Discussion on US System of D&O Insurance and Implications for China), Working Paper.
- Wei, M. and Liu, J. (2007), 'Guoqi Fenhong, Zhili Yinsu yu Guodu Touzi' (Dividends, Governance Factors and Over-investment of State-owned Enterprises), *Management World*, Issue 4: 88-95.
- Xu, X. and Zhang, T. (2009), 'Gongsi Zhili, Ziyou Xianjinliu yu Feixiaolu Touzi' (Corporate Governance, Free Cash Flow and Ineffective Investment in China), *Journal of Finance and Economics* 35 (10): 47-58.
- Zou, H., Wong, S., Shum, C., Xiong, J., and Yan, J. (2008), 'Controlling-Minority Shareholder Incentive Conflicts and Directors' and Officers' Liability Insurance: Evidence from China', *Journal of Banking and Finance* 32 (12): 2636-2645.

## 高管责任险与公司投资有效性<sup>\*</sup>

陈信元 朱凯 李楠<sup>7</sup>

投稿日：2014年5月29日 录用日：2015年6月1日  
© 作者 2015。本文由香港理工大学以开放取用(open access)方式出版。

### 摘要

本文研究了中国上市公司购买董事、监事和高级管理人员责任险（以下简称高管责任险）对公司投资决策的影响。本文以代理理论为基础，结合中国制度背景和上市公司投保高管责任险的行为，分析了投保高管责任险在上市公司投资决策中的作用。研究结果显示，公司投保高管责任险以后，过度投资现象更为严重，而且投资效率更低。可见公司投保高管责任险固然有助于降低高管的诉讼风险，但是显著地提高了公司的代理成本，降低了公司治理效率。本研究的启示是，在现有的制度环境下，必须要同时推动保护中小股东利益的制度发展，才能够保证高管责任险有效发挥其分散风险、改进公司治理的作用。

关键词：高管责任险、过度投资、投资有效性

中图分类号：F0、F27、F832

---

<sup>\*</sup> 本文是国家自然科学基金面上项目“国有企业绩效考核体系：改革及其经济后果”（71272008）的阶段性成果，并得到了教育部人文社会科学重点研究基地项目资助（11JJD790008 和 14JJD630005）、上海市教育委员会课题（2014111143）和上海财经大学“211”项目的资助。感谢《中国会计与财务研究》的编辑和两位匿名审稿人提出的意见，他们的意见极大地促进了本文的修改和完善。当然文责自负，本文的所有错误和遗漏均由本文作者承担。

<sup>7</sup> 陈信元，上海财经大学会计与财务研究院。朱凯（通讯作者），上海财经大学会计与财务研究院，联系地址：上海市国定路 777 号上海财经大学会计学院，邮政编码：200433；电子邮件：aczhuk@mail.shufe.edu.cn。李楠，上海财经大学会计学院。

## 一、引言

本文研究了中国上市公司购买董事、监事和高级管理人员责任险（以下简称高管责任险）对公司财务决策行为的影响。按照英国特许保险协会的定义，高管责任险是为“公司、企业及其他机构的董事和高级职员对第三方的经济损失应付的责任提供保障”的特殊职业责任险，主要表现为保险机构为被保险的董监事和高级管理人员支付相关的法律诉讼成本和民事赔偿责任。

1930年高管责任险首次出现在英国，但是直到二十世纪六十年代才在美国资本市场中获得了巨大的发展，目前90%以上的美国大公司都购买了高管责任险。在中国资本市场中，虽然有来自政府部门和证券交易所的推动，公司却并不青睐高管责任险。在2002年平安保险售出首单高管责任险以后，仅有3%不到的中国上市公司购买过此项保险。高管责任险在中国陷入了“叫好不叫座”的尴尬境地（王鑫，2009）。而高管责任险对公司治理和公司价值的影响，学术研究的结论也不完全一致。

目前针对高管责任险的研究，主要集中于公司是否投保高管责任险的成因及其经济后果两个方面，相应的研究发现可概括为三个假说：（1）公司治理假说，即高管责任险投保与否及其价格体现了公司治理状况，治理效率越差的公司更容易投保高管责任险（Zou *et al.*, 2008），且支付责任险价格更高（Core, 1997, 2000），高管责任险可以作为提升公司治理情况的有效手段，在外部董事较多的情况下投保概率更高（O'Sullivan, 1997），同时，高管责任险提供了“最后的机会”弥补投资者由于高管决策失误所造成的损失，起到投资者保护的作用（Boyer, 2014）；（2）机会主义假说，即高管利用私有信息提前购买责任险，以降低未来业绩下降所引发的潜在诉讼风险（Chambers *et al.*, 2002），增加高管薪酬（Kang, 2011）；（3）道德风险假说，即购买责任险让高管免于承担股东诉讼所造成的法律责任，导致公司会计信息稳健性降低（Chung and Wynn, 2008），使其在并购其它公司时出价更高，市场对并购预期较差（Lin *et al.*, 2011）。

本文分析了在中国现有的制度背景下，投保高管责任险对公司投资决策及其价值相关性的影响。和其他任何保险机制一样，高管在购买了责任险以后，预期到其行为的不利后果将由保险公司承担，导致公司自由现金流所隐含的代理成本显著上升。在目前中国对中小投资者保护机制还不完善的情况下，上述效应会体现的更为明显。本文以中国上市公司为样本，从横截面和时间序列两个角度检验了投保高管责任险的代理成本，研究结果发现，与未投保高管责任险的公司（时期）相比，投保高管责任险的公司（时期）过度投资问题更为严重，投资效率显著下降。这些结果支持了本文的研究假说，投保高管责任险增加了中国上市公司的代理成本。

本文的研究结论，在理论上为检验中国制度背景下投保高管责任险及其经济后果提供了崭新的视角。本文以中国上市公司是否投保高管责任险为契机，比较了公司之间和同一公司投保高管责任险前后的过度投资行为差异，为检验投保高管责任险的经济后果提供了经验证据。同时，本文的研究结论表明，在现阶段，上市公司投保高管责任险固然有助于降低高管的法律诉讼风险，但是未必有利于增加股东的价值，因此，

上市公司投保高管责任险的必要性是值得商榷的。

本文其余部分的安排如下：第二部分是制度背景与理论分析；第三部分是样本选择与研究设计说明；第四部分是实证检验与分析；第五部分是结论。

## 二、制度背景与理论分析

### （一）高管责任险：国际检验与研究发现

随着现代企业制度的兴起，董事和高级管理人员在公司治理中居于核心地位，高管的代理问题对股东价值的影响，已经成为理论和实务界共同关注的问题。为了保护投资人的利益，各国立法纷纷加重董事与高管的法律责任。但是公司的经营过程总是面临各种市场风险，高管作为公司业务的具体执行者，难以避免判断错误或市场环境变化等原因造成的损失。当高管因经营失误而面临诉讼的情况下，高管不仅要花费时间和相应的诉讼费用，还要支付潜在的高额赔偿金。在强化高管责任的同时，如何克服法律给董事造成的消极影响，确保董事安心地尽其所能为公司服务，就成为政府在制定公司相关法律时必须考虑的问题。

各国法律对高管责任险的观点并不完全一致。虽然高管责任险制度在英美等国得到了充分的发展，但是德国等欧洲大陆国家的法律界认为，为了保证董事决策的合理性，维持高管履行责任的谨慎义务和道德标准，应当禁止公司投保高管责任险。在很多欧洲大陆国家中，高管责任险的实践范围也非常有限。因此，高管责任险在公司治理中的作用，特别是在保护和激励公司高管的同时，是否有助于提高公司价值，在学术界和法律实践中仍存在非常大的分歧。

高管责任险已经有 80 多年的历史，而且在英美资本市场上有着充分的发展。1998 年底，92% 的美国上市公司和 84% 的加拿大上市公司都购买了高管责任险。但是，相应的实证研究却是最近 20 年才开始出现。理论与实践脱节的主要原因是，1990 年代以前，公司并不披露投保高管责任险的相关数据和信息。1990 年代，英国和加拿大的公司治理准则要求公司披露进行风险控制的手段和工具，从而使研究高管责任险的作用成为可能。

有关高管责任险的研究主要集中在购买该保险是否影响公司决策及其经济后果两方面。部分学者基于公司治理理论探讨购买高管责任险对以上两者影响：一方面，Holderness（1990）从监督角度提出了高管责任险的公司治理作用，当公司投保高管责任险时，实际上也是保险公司对公司潜在的诉讼风险进行评估的过程；来自保险公司的监督将有助于降低公司的法律诉讼风险，改善公司治理。Core（1997, 2000）、O'Sullivan（1997）、Kang（2011）发现美国、英国、加拿大上市公司支付的高管责任险价格与公司治理有效性指标之间存在显著的负向关系，支持了 Holderness（1990）的观点。Zou *et al.*（2008）基于中国背景下，也得出类似结论，发现上市公司大股东与中小股东利益冲突与投保高管责任险的需求呈显著正相关关系，且外部董事等监督机制越完善，支付高管责任险需求意愿越强。Boyer（2014）则从投资者保护的角度说



明投保高管责任险可有效弥补经理人所犯错误的损失，进而保护投资者利益。

另一些学者发现投保公司的高管更喜欢利用私有信息（机会风险假说）做出有利于自身的选择，更易于采取激进的财务策略（道德风险理论）。Chalmers *et al.* (2002) 通过研究股票业绩表现较差的上市公司发现，投保高管责任险与 IPO 股票上市的收益率呈显著负相关，公司高管通过提前购买高管责任险获取私利。Baker and Griffith (2007) 的访谈研究结论也发现，保险公司并没有发挥监督作用或者提供止损服务，保险价格仅仅是反应了分散诉讼风险的程度。Chung and Wynn (2008) 发现投保高管责任险令管理人下调预期风险，降低会计稳健性。Lin *et al.* (2011) 发现购买高管责任险的公司并购时支付溢价更高，且市场预期更差。Lin *et al.* (2013) 发现公司高管责任险覆盖范围较高，公司风险较大，银行对该类公司贷款利差也更高。

## （二）制度背景与研究假说

中国证监会在 2002 年颁布《上市公司治理准则》第 39 条中明确提出，经股东大会批准，上市公司可以为董事购买责任保险。随着我国修订的《公司法》、《证券法》对董事和高管民事责任的强调和规定，公司高管的法律诉讼风险显著提高。2007 年保监会副主席周延礼表示，高管责任险在保护高管利益的同时，也有助于保护中小股东的合法权益，使其针对上市公司及其高管的合法索赔得到充分赔偿。

尽管中国投资者保护机制仍在完善过程中，但是高管面临的证券有关的民事诉讼风险日益彰显。2008 年投资者因中捷股份虚假陈述而进行的民事诉讼中，就将公司实际控制人和董事长蔡开坚作为被告。尽管在最后的和解协议中，原告放弃对蔡开坚的诉讼请求，但是这也标志着中国上市公司的高管成为证券诉讼对象的开端。根据美亚公司编制的《A 股上市公司董事及高管责任险风险季刊》，由中小股东提起的证券民事诉讼案件数量上升趋势明显。2012 年，原告律师针对至少 31 起案件征集受损失的投资者，准备提起证券民事诉讼。

在实践中，2002 年平安保险公司就推出了董事与高级职员责任险，但迄今为止只有不到 3% 的上市公司购买过高管责任险，且主要集中在海外上市的公司和银行中。可以认为，高管责任险在我国尚处于起步阶段，其在完善公司治理和发展资本市场中的作用仍然需要深入的探讨。作为特殊的保险业务，高管责任险固然有助于分散高管潜在的诉讼风险，但是也不可避免地像其他保险业务一样存在“道德风险”问题（Arrow, 1963; Holmstrom, 1979）。和经典的“道德风险”不同的是，在投保责任险以后，高管决策行为的变化，不仅影响保险机构的收益和风险水平，也会影响公司投资行为决策和股东利益。

在没有投保高管责任险的情况下，如果高管因为个人财富约束问题，不愿意承担预期的高诉讼风险，会放弃一些可以增加公司价值但是风险较高的项目，从而导致投资不足（Myers and Majluf, 1984; Fazzari *et al.*, 1988）。投保高管责任险降低了高管的风险预期，使其愿意接受风险较高但可以增加公司价值的项目，从而提升投资者对公司预期，增加公司价值。另一方面，在没有投保高管责任险的情况下，未来的诉讼风险在一定程度上也约束了高管的投资行为，使其不能投资风险过高的项目。依据代理

理论, 当投保了高管责任险后, 高管对实际投资决策失误所承担的责任降低, 其预期诉讼风险下降, 为获取个人私利其决策行为更为激进 (Baker and Griffith, 2007; Chung and Wynn, 2008; Lin *et al.*, 2011), 从公司层面来讲, 在新增投资上, 为了获取高额收益, 就会投资原先不可接受的高风险项目, 将自由现金流投资到净现值为负的项目中, 引致过度投资, 增加了公司的代理成本。

基于此, 本文提出假说 1:

**假说 1: 投保高管责任险的公司, 其过度投资和自由现金流的相关性更高。**

另一方面, 检验作为外部报表使用者的股东对公司购买责任险的预期, 即从市场层面检验投资与股东价值相关性也是衡量高管责任险经济后果重要指标之一。从市场层面来讲购买责任险分散了高管所承担的风险, 高管通过过度投资谋取个人私利, 降低投资效率, 损害公司价值, 这种行为增加了公司代理成本 (Jensen, 1986); 尽管投保高管责任险固然有助于增加股东诉讼赔偿的收益, 但这是一种事后的结果, 难以在事前有效约束高管的代理行为, 是一种低效率的公司治理机制 (Jensen, 1993; Richardson, 2006)。如果投资者理性预期到这一点, 就会降低对公司价值的预期, 表现为公司投资与股价的相关性下降, 即投资价值相关性降低。基于此, 本文提出第二个假说:

**假说 2: 投保高管责任险的公司, 其过度投资与投资价值相关性显著下降。**

### 三、 样本选择与研究设计

#### (一) 样本选择

本文以 2002-2012 年的非金融类上市公司为研究样本。在样本选择过程中, 剔除了具有以下特征的公司: (1) 资产总额缺失; (2) 销售收入为负或缺失; (3) 股东权益为负; (4) 当年发行股票上市; (5) 当年股票交易日期不足 10 个月; (6) 行业年度样本观测值不足 30; (7) 相关财务指标缺失。本文确定了 13,338 个观测值, 共 1,989 家上市公司, 平均年度为 6.7 年。

本文通过手工查询上市公司年报、股东大会公告和董事会公告, 以确定公司在当年是否投保高管责任险。最终确定有 109 家上市公司在不同时期投保了高管责任险,<sup>8</sup> 投保高管责任险的公司年度总计为 188, 占样本总数 (13,338) 的 1.41%, 略低于以往的统计数据 (王鑫, 2009), 其中主要原因是本文的样本中不包括金融类上市公司, 而金融类上市公司大多数都投保了高管责任险。

除公司投保高管责任险的信息为手工收集以外, 其他相关的财务数据和股价数据

---

<sup>8</sup> 例如万科 (000002) 在 2004 年和 2005 年年报中披露了公司当年投保高管责任险的情况。但是 2006 年以后, 万科没有将投保高管责任险列入股东大会的审议项目, 也未在年报中披露是否披露高管责任险的相关信息。据此我们假定万科在其他年份没有投保高管责任险。

均取自国泰安数据库。

## （二）研究设计和指标说明

### （1）公司投资决策影响因素模型

根据研究假说，投保高管责任险不仅影响公司的投资决策行为，还会影响投资决策的价值相关性。为了检验假说 1，本文在 Richardson（2006）模型的基础上，检验投保高管责任险的公司自由现金流与过度投资的相关性。<sup>9</sup> 根据 Richardson（2006）模型，本文对以下模型进行分行业和年度回归，以回归预测值作为公司预期投资水平（*ECAPX*）。

$$CAPX_t = a + b_1CASH_{t-1} + b_2LEV_{t-1} + b_3OCF_{t-1} + b_4SLG_t + b_5MV_{t-1} + b_6TQ_{t-1} + b_7CAPX_{t-1} + \varepsilon \quad (1-1)$$

在模型(1-1)的基础上，本文采用以下模型检验自由现金流—过度投资的相关性：

$$DCAPX = \alpha' + \beta_1'DO + \beta_2'FCF + \beta_3'DO * FCF + \varepsilon \quad (1-2)$$

其中，*CAPX* 表示公司的净投资规模，具体的衡量指标为“购置固定资产、无形资产和其他长期资产支付的现金+购买子公司支付的现金—处置固定资产、无形资产和其他长期资产收到的现金—处置子公司收到的现金—固定资产折旧—无形资产摊销—其他长期资产摊销”。*DO* 为虚拟变量，表示公司当期是否投保高管责任险，1 表示投保高管责任险，0 表示未投保高管责任险。*DCAPX* 表示公司过度投资的水平，为公司实际净投资规模（*CAPX*）与预期净投资规模（*ECAPX*）之差，*DCAPX* 大于 0 代表投资过度，*DCAPX* 小于 0 则表示投资不足。*CASH* 表示公司持有的现金和现金等价物水平，*LEV* 表示公司的有息负债水平，*SLG* 表示营业收入增长率，在这里之所以没有使用 Tobin's Q 作为营业收入增长率的度量，原因在于 Tobin's Q 指标本身附有多重解释含义，它既可以代表成长性，也可以代表盈利能力，还可以代表投资效率等方面，本文重点研究的是营业收入的增长幅度，因此直接进行计算。*FCF* 表示自由现金流，为公司经营活动现金流（*OCF*）与预期净投资规模（*ECAPX*）之差。Richardson（2006）认为，当 *DCAPX* > 0 时，如果  $\beta_2'$  显著为正，表示公司的自由现金流越高，投资过度问题越严重。在模型（1-2）中，如果  $\beta_2'$  和  $\beta_3'$  都显著为正，表明投保高管责任险显著提高了公司自由现金流和过度投资的相关性。

### （2）投资价值相关性模型

本文以万华林等（2012）模型为基础，通过检验股票收益与投资之间的相关性考察投保高管责任险对投资效率的影响，具体模型如下：

<sup>9</sup> 国内学者（李鑫，2007；刘昌国，2006；郝颖等，2007；徐晓东和张天西，2009；魏明海和柳建华，2007）运用 Richardson（2006）模型，从不同角度检验了我国上市公司代理行为对过度投资的影响，验证了 Richardson（2006）模型在中国环境中的适用性。

$$RET_t = \gamma + \delta_1 DO_t + \delta_2 CAPX_t + \delta_3 DO_t * CAPX_t + \delta_4 OCF_t + \delta_5 DO_t * FCF_t + \delta_5 MV_{t-1} + \delta_6 BM_{t-1} + \delta_7 LEV_{t-1} + \varepsilon \quad (2)$$

其中,  $RET$  为股票年度收益率,  $CAPX$  为模型 (1) 中的投资规模。如果投保高管责任险降低了高管的风险预期, 鼓励了公司的有效投资, 那么在模型 (2) 中,  $\delta_3$  应当显著为正; 反之, 如果投保高管责任险引发了公司的过度投资, 那么在模型 (2) 中,  $\delta_3$  应当显著为负。在检验过程中, 本文进一步将投资规模区分为预期投资 ( $ECAPX$ ) 和过度投资 ( $DCAPX$ ), 并检验在公司投保高管责任险情况下, 对预期投资和过度投资价值相关性的影响。

模型 (2) 中的控制变量包括:  $MV$  以流通股市值对数值为衡量,  $BM$  则以股票面值-市值比为衡量指标,  $LEV$  则是有息负债 (短期借款、一年内到期的长期借款、长期借款和应付债券之和) 与流通股市值之比。

表 1 变量定义

变量	变量解释
投保信息:	
$DO$	虚拟变量, 表示公司当期是否投保高管责任险, 1 表示投保高管责任险, 0 表示未投保高管责任险。
公司特征:	
$CAPX$	公司的净投资规模, (购置固定资产、无形资产和其他长期资产支付的现金+购买子公司支付的现金-处置固定资产、无形资产和其他长期资产收到的现金-处置子公司收到的现金-固定资产折旧-无形资产摊销-其他长期资产摊销) 除以上一年末流通股市值
$ECAPX$	对模型 (1-1) 进行分行业和年度回归得出的回归预测值
$DCAPX$	公司过度投资的水平, 公司实际净投资规模 ( $CAPX$ ) 与预期净投资规模 ( $ECAPX$ ) 之差除以上一年末流通股市值, $DCAPX$ 大于 0 代表投资过度, $DCAPX$ 小于 0 则表示投资不足
$FCF$	公司经营活动现金流 ( $OCF$ ) 与预期净投资规模 ( $ECAPX$ ) 之差除以上一年末流通股市值
$CASH$	公司持有的现金和现金等价物水平除以上一年末流通股市值
$LEV$	公司的有息负债水平除以上一年末流通股市值
$SLG$	公司营业收入的增长率, 公司当年营业收入与上一年营业收入之差除以上一年营业收入
$RET$	股票年度收益率
$MV$	流通股市值对数值
$BM$	股票面值-市值比, 为每股股东权益账面价值除以每股价格
$TQ$	2007 年以前为 (流通股市值+非流通股市值 $\times 0.7$ +总资产-所有者权益) 除以总资产; 2007 年以后为 (流通股市值+总资产-所有者权益) 除以总资产

本文对上述模型中的所有连续变量（除 *RET*、*SLG*、*MV*、*TQ* 和 *BM* 以外）中，均除以上一年末的流通股市值，目的是为了控制规模效应的影响，并保证上述模型之间度量指标的可比性。为了控制极端值，本文对所有的连续变量均按照上下 1% 的分位数进行修饰（winsorize）。

### （3）研究方法

为了控制潜在的内生性问题，本文拟采用横截面比较和时间序列比较两种方法，对上述回归模型进行检验。横截面比较包括了所有的样本，但是难以有效控制截面之间公司特征差异的影响；时间序列比较则将分析对象集中于 109 家投保过高管责任险的公司（共 1,015 个观测值），分析比较投保高管责任险前后，公司的投资行为和投资有效性差异，以此控制不可观测的公司特征对本文结论的可能影响。同时，本文采用配对样本方法，分别以公司投保年份前一年到后一年、前一年到后两年为主要研究区间，以同行业内符合条件的没有购买责任险的公司为对照样本，投保责任险公司为研究样本，检验上述回归模型。

## 四、实证检验与分析

### （一）描述性统计与相关性分析

表 2 列示了本文样本的行业分布情况。行业是按照中国证监会规定的《上市公司行业分类指引》，对制造业采用行业前两位代码，非制造业采用首位代码作为分类标准，共 18 个行业。在表 2 中，除了农林牧渔业和建筑业以外，其他行业中均有公司投保高管责任险，<sup>10</sup> 其中，投保高管责任险数量和比例最高的行业为交通运输仓储业，投保高管责任险的样本为 25，占同行业样本（573）的比例为 4.18%；其次为石油化学行业，投保高管责任险的样本为 19，占同行业样本（1,541）的比例为 1.22%。表 2 的结果说明，行业之间的系统性差异并没有导致投保高管责任险的公司集中在特定的行业中。

表 3 分别列示了全部样本和投保公司样本相关指标的描述性统计。在表 3 中，投保的观测值（*DO*）占全样本的 1.4%。在投保过高管责任险的样本（1,015）中，明确披露当年是否投保的样本比例为 18%，说明在投保过高管责任险的上市公司中，实际投保高管责任险所影响的年度也相对较少。

当然也存在这样一种可能性，即上市公司在某一年度购买了长期的高管责任险，在以后的年度中就不再披露，导致表 3 的统计结果相对偏低。根据手工收集的数据显示，公司披露的高管责任险都是 1 年的保险期，最低保费率为 0.19%，最高保险金额为 3.15 亿元。另一方面，公司购买长期的高管责任险而没有披露，有可能导致本文误将高管责任险覆盖期间划分为无保险覆盖期间。如果 *DO* 相关的回归系数显著异于 0，

<sup>10</sup> 剔除农林牧副渔业和建筑业的样本，没有改变本文的结论。

那么这一分类错误反而低估了 *DO* 相关指标的影响，即如果能够更有效地衡量出高管责任险覆盖期，那么本文的回归结果将会比报告的结果更为显著。

表 2 样本的行业分布

行业名称	投保高管责任险的	未投保高管责任险	投保样本所占比例
	样本量	的样本量	
农林牧渔业	0	34	0.00%
采掘业	2	159	1.24%
食品饮料业	8	644	1.23%
纺织服装皮毛业	5	513	0.97%
造纸印刷业	3	91	3.19%
石油化学塑胶塑料业	19	1,541	1.22%
电子业	13	541	2.35%
金属非金属业	13	1,258	1.02%
机械设备仪表业	18	2,406	0.74%
医药生物制品业	10	888	1.11%
电力煤气和水生产供应业	9	636	1.40%
建筑业	0	64	0.00%
交通运输仓储业	25	573	4.18%
信息技术业	12	735	1.61%
批发零售业	16	1,026	1.54%
房地产业	13	1,058	1.21%
社会服务业	9	399	2.21%
综合	13	584	2.18%
合计	188	13,150	1.41%

在表 3 中，与全样本相比，投保过高管责任险的样本公司，其公司市场价值 (*MV*) 更高（平均为 63.1 亿元）。在财务指标方面，投保过高管责任险的样本公司现金比重较高 (0.408)，债务比例较高 (0.264)，营业收入增长率较低 (0.206)，说明此类公司的成长性相对较低，反映为较高的股权面值市值 (*BM* 均值为 1.158)。

投保过高管责任险的样本公司，其自由现金流 (*FCF*) 也更高 (0.121)，表明此类公司的盈利水平虽然较高，但是自由现金流问题也较严重；此类公司的投资比重更高 (*CAPX* 的均值为 0.107)，且过度投资程度更高 (*DCAPX* 的均值为 0.005)。

表 4 和表 5 为变量的相关系数检验结果，表 4 中过度投资 (*DCAPX*) 与自由现金流 (*FCF*) 相关系数显著为正，表明公司将自由现金流进行了过度投资，公司存在严重的代理问题 (Jensen, 1986)。在表 5 中，无论是投资 (*CAPX*) 还是过度投资 (*DCAPX*)、预期投资规模 (*ECAPX*) 同股票年回报 (*RET*) 相关系数均为正，说明在总样本中公

司固定投资有助于提高投资效率。股票年回报 (*RET*) 同 *MV* 的相关系数显著为负, 表明股票市值越大的公司, 其股票收益率越低。

表 3 描述性统计结果

全样本						
变量名	样本量	均值	标准差	最小值	中位数	最大值
<i>DO</i>	13338	0.014	0.118	0.000	0.000	1.000
<i>CAPX</i>	13338	0.073	0.201	-0.312	0.017	1.196
<i>DCAPX</i>	13338	0.000	0.132	-0.384	-0.010	0.566
<i>ECAPX</i>	13338	0.072	0.136	-0.394	0.040	1.377
<i>FCF</i>	13338	0.059	0.273	-0.746	0.025	1.369
<i>CASH</i>	13338	0.337	0.372	0.005	0.214	2.185
<i>LEV</i>	13338	0.244	0.166	0.000	0.238	0.657
<i>SLG</i>	13338	0.224	0.545	-0.678	0.140	3.821
<i>RET</i>	13338	0.267	0.884	-0.749	-0.061	3.724
<i>MV</i>	13338	7.269	1.186	4.023	7.150	14.410
<i>BM</i>	13338	0.986	0.864	0.066	0.725	4.905
<i>TQ</i>	13338	2.038	1.336	0.810	1.585	8.788
投保过高管责任险的公司样本						
<i>DO</i>	1015	0.185	0.389	0.000	0.000	1.000
<i>CAPX</i>	1015	0.107	0.271	-0.312	0.023	1.196
<i>DCAPX</i>	1015	0.005	0.145	-0.384	-0.010	0.566
<i>ECAPX</i>	1015	0.102	0.195	-0.213	0.040	1.234
<i>FCF</i>	1015	0.121	0.368	-0.746	0.051	1.369
<i>CASH</i>	1015	0.408	0.451	0.005	0.251	2.185
<i>LEV</i>	1015	0.264	0.163	0.000	0.259	0.657
<i>SLG</i>	1015	0.206	0.436	-0.678	0.146	3.821
<i>RET</i>	1015	0.258	0.865	-0.749	-0.059	3.724
<i>MV</i>	1015	7.636	1.332	4.643	7.485	12.209
<i>BM</i>	1015	1.158	1.062	0.066	0.859	4.905
<i>TQ</i>	1015	1.830	1.143	0.810	1.432	8.788

## (二) 回归结果与分析

为了检验假说 1, 本文以 Richardson (2006) 过度投资模型为基础, 检验投保高管责任险的样本, 其过度投资与自由现金流的相关性是否显著增加。相应的回归结果列示于表 6。

表 4 模型 1 主要变量 Pearson 相关系数

	CAPX	DO	DCAPX	FCF	CASH	LEV	SLG	RET	MV	BM	TQ
CAPX	1.000										
DO	0.029***	1.000									
DCAPX	0.741***	0.008	1.000								
FCF	0.021**	0.026***	0.118***	1.000							
CASH	0.131***	0.076***	0.030***	0.091***	1.000						
LEV	0.197***	0.019**	0.084***	-0.062***	0.008	1.000					
SLG	0.090***	0.004	0.009	0.023***	0.056***	0.006	1.000				
RET	0.075***	-0.006	0.022**	0.152***	-0.004	-0.031***	0.090***	1.000			
MV	0.019**	0.040***	0.031***	-0.087***	0.555***	-0.022**	-0.001	-0.238***	1.000		
BM	0.228***	0.016*	0.028***	0.205***	0.094***	0.056***	-0.011	-0.288***	-0.212***	1.000	
TQ	-0.121***	-0.015*	-0.029***	-0.052***	-0.115***	-0.281***	0.056***	0.402***	0.034***	-0.492***	1.000

表 5 模型 2 主要变量 Pearson 相关系数

	RET	DO	CAPX	DCAPX	FCF	ECAPX	FCF	MV	BM <sub>t-1</sub>	LEV <sub>t-1</sub>
RET	1.000									
DO	-0.006	1.000								
CAPX	0.075***	0.029***	1.000							
DCAPX	0.022**	0.008	0.741***	1.000						
ECAPX	0.089***	0.035***	0.761***	0.129***	1.000					
FCF	0.152***	0.026***	0.021**	0.118***	-0.083***	1.000				
MV	-0.238***	0.040***	0.019**	0.031***	-0.087***	1.000				
BM <sub>t-1</sub>	0.217***	0.026***	0.267***	0.028***	0.333***	-0.363***	1.000			
LEV <sub>t-1</sub>	0.017**	0.016*	0.108***	0.010	0.069***	-0.047***	0.047***	1.000		



表 6 模型 (1-2) 的回归结果 (因变量: *DCAPX*)

	全样本				投保公司样本			
	<i>DCAPX</i> > 0		<i>DCAPX</i> < 0		<i>DCAPX</i> > 0		<i>DCAPX</i> < 0	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.088*** (5.017)	0.088*** (5.052)	-0.050*** (-5.301)	-0.050*** (-5.301)	0.240* (1.833)	0.246* (1.951)	-0.033* (-1.804)	-0.032* (-1.729)
<i>DO</i>	0.017 (1.239)	0.005 (0.443)	-0.005 (-0.789)	-0.005 (-0.651)	0.024 (1.561)	0.010 (0.721)	-0.004 (-0.550)	-0.008 (-0.944)
<i>FCF</i>	0.055*** (6.527)	0.051*** (6.005)	0.001 (0.187)	0.001 (0.198)	0.073*** (3.597)	0.050** (2.262)	-0.029** (-2.018)	-0.037** (-2.111)
<i>DO*FCF</i>		0.108** (2.482)		-0.003 (-0.152)		0.110** (2.391)		0.033 (1.274)
行业	控制	控制	控制	控制	控制	控制	控制	控制
年度	控制	控制	控制	控制	控制	控制	控制	控制
样本量	5594	5594	7744	7744	438	438	577	577
Adjusted R <sup>2</sup>	0.168	0.170	0.206	0.206	0.296	0.311	0.213	0.215
F值	29.880	29.241	54.656	52.852	6.452	6.914	5.192	5.049

注: ( ) 内为 t 值, \*\*\*, \*\*, \* 分别表示 1%、5% 和 10% 的显著性水平。

表 6 中的回归系数标准误是以公司聚类 (cluster) 为基础计算。其中, 第 (1) 至 (4) 栏为全样本回归结果, 第 (5) 至 (8) 栏为投保公司的子样本回归结果。这里, 对“投保公司样本”定义是只要该公司在考察时间段内有投保行为, 则认为它是投保公司样本。*DO* 则是对时间区间的定义, 如果投保公司当期投保责任险, *DO* 为 1; 否则为 0。根据 Richardson (2006), 当 *DCAPX* 大于 0 的情况下, 如果 *FCF* 的回归系数显著为正, 表明公司将自由现金流进行了过度投资, 公司存在严重的代理问题 (Jensen, 1986)。因此, 在表 6 中, 我们进一步将样本按照 *DCAPX* 是否大于 0 区分成两组子样本, 并分别回归。

在所有过度投资子样本回归结果中, *DO* 的系数都为正, 但是均不显著; *FCF* 的系数显著为正, 表明自由现金流量更容易引发公司的过度投资, 与 Richardson (2006) 的发现一致。作为本文主要的研究对象, *DO\*FCF* 的系数显著为正, 表明公司在投保了高管责任险的情况下, 显著提高了自由现金流与过度投资的相关性, 增加了公司的代理成本。无论是在全部样本还是投保公司样本中, 这一结论都是成立的。而在投资不足 (*DCAPX* < 0) 的情况下, *DO\*FCF* 的系数并不显著, 表明公司投保高管责任险以后, 并没有改变投资不足与自由现金流的相关性。因此, 表 6 的结果说明投保高管责任险会引发公司运用自由现金流进行过度投资, 和“代理成本”理论也是一致的。

为了检验公司投资决策与股价之间的相关性, 本文对模型 (2) 进行了回归, 结果见表 7。

表 7 模型 (2) 的回归结果 (因变量:  $RET$ )

	全样本		投保公司样本	
	(1)	(2)	(3)	(4)
Constant	0.833*** (7.587)	0.879*** (8.019)	0.455 (1.643)	0.471* (1.704)
$DO_t$	0.044 (1.357)	0.060 (1.623)	0.049 (1.276)	0.050 (1.170)
$CAPX_t$	0.164*** (5.439)		0.176*** (2.720)	
$DO_t * CAPX_t$	-0.440** (-2.484)		-0.376** (-2.206)	
$DCAPX_t$		0.088** (2.035)		0.180 (1.507)
$DO_t * DCAPX_t$		-0.443 (-1.509)		-0.543* (-1.784)
$ECAPX$		0.352*** (7.041)		0.233 (1.570)
$DO * ECAPX$		-0.663** (-2.552)		-0.430* (-1.719)
$FCF_t$	0.209*** (9.204)	0.237*** (9.543)	0.122* (1.766)	0.125* (1.696)
$DO_t * FCF_t$	0.116 (0.692)	0.116 (0.689)	0.236 (1.422)	0.248 (1.507)
$MV_{t-1}$	-0.052*** (-10.647)	-0.054*** (-11.166)	-0.034*** (-3.084)	-0.035*** (-3.142)
$BM_{t-1}$	-0.014* (-1.770)	-0.023*** (-2.848)	-0.025 (-1.129)	-0.026 (-1.039)
$LEV_{t-1}$	-0.059** (-2.289)	-0.071*** (-2.758)	-0.088 (-0.920)	-0.093 (-0.907)
行业	控制	控制	控制	控制
年度	控制	控制	控制	控制
样本量	13338	13338	1015	1015
Adjusted R <sup>2</sup>	0.712	0.713	0.719	0.718
F值	779.06***	650.38***	72.60***	69.37***

注: ( ) 内为 t 值, \*\*\*, \*\*, \* 分别表示 1%、5% 和 10% 的显著性水平。

表 7 回归系数标准误是以公司聚类 (cluster) 为基础计算, 第 (1) 至 (2) 栏为基于全样本的回归结果, 第 (3) 至 (4) 栏为基于投保公司样本的回归结果, 对投保

公司样本和  $DO$  的定义同表 6。其中，第 (1) 栏与第 (3) 栏是以公司净投资额作为解释变量的回归结果；第 (2) 栏和第 (4) 栏是将净投资额 ( $CAPX$ ) 分为过度投资额 ( $DCAPX$ ) 和预期投资额 ( $ECAPX$ ) 进行回归的检验结果。表 7 的结果显示，所有解释变量的回归结果基本上是一致的，说明样本选择和模型设定没有影响回归结果。

在表 7 中， $DO$  的符号虽然为正，但结果都不显著；而净投资额 ( $CAPX$ ) 在全样本和投保样本中，其回归系数均为正，且显著水平为 1%，表明公司固定资产投资有助于提高股东价值，平均而言，公司投资是有效率的，可以提高公司价值；超额投资量 ( $DCAPX$ ) 与预期投资额 ( $ECAPX$ ) 在全样本均显著为正，且显著水平为 5% 和 1%；在投保样本中，超额投资量与预期投资量的回归系数均为正，但是均不显著。

作为主要解释变量， $DO*CAPX$  的回归系数均为负数，且其显著性水平为 5%； $DO*DCAPX$  系数在子样本中均显著为负，显著性水平为 10%；而  $DO*ECAPX$  的系数无论在全样本还是子样本中均显著为负数，且显著性水平分别为 5% 和 10%；说明在投保了高管责任险的公司中，其投资的价值相关性下降，即在投保高管责任险后，因为预期诉讼风险的降低，高管对投资项目收益的敏感性下降，更容易接受那些不能增加股东利益的项目，从而在整体上降低了投资效率，削弱了投资与股票收益率的相关性。其他控制变量与股票收益率的关系也与预期相同。 $FCF$  的回归系数显著为正，说明公司自有现金流越多，股票收益越高，但是购买高管责任险并没有改变自由现金流的价值相关性 ( $DO*FCF$  的系数均不显著)。 $MV$  的回归系数显著为负，表明股票市值越大的公司，其股票收益率越低，验证了中国股票市场中的规模效应。除第 3、4 两列， $BM$  的回归系数显著为负，表明在中国股票市场中，投资者更为青睐高成长性的股票； $LEV$  在全样本中系数显著为负，说明公司杠杆越高，当期股票收益越低。

公司的投资不仅会影响当期的收益，也会影响到未来期间的收益，即公司投资的经济后果未必完全反映在当期的股票收益率中，也有可能反映在未来的股票收益中。因此，本文检验了公司当期投资与下一年度股票收益率 ( $FRET$ ) 之间的相关性，并考察购买高管责任险对此相关性的影响，但是结果显示购买高管责任险并没有改变投资和未来股价的相关性。<sup>11</sup>

### (三) 稳健性检验

本文采用公司层面的固定效应模型对假说 1 和假说 2 进行稳健性检验，结果与原文一致：在投保了高管责任险的情况下，公司更倾向于将自由现金流用于过度投资，从而降低了投资价值相关性。

本文没有采用自选择内生性模型的原因是，现有的自选择内生性模型(以 Heckman 模型为代表)都是直接检验第一阶段的残差项(或预测值)对结果的直接影响，尚未有探讨自选择内生性对交互项的检验模型。因此，本文退而求其次，用配对样本的方

<sup>11</sup> 本文检验公司当期投资与下一年度股票收益率 ( $FRET$ ) 之间的相关性，发现是否投保高管责任险并没有显著影响投资的长期价值相关性。限于篇幅，正文中没有列示相应的表格。

法对假说来检验。<sup>12</sup>

表 8 和表 9 是采用配对样本回归结果。本文以每家公司购买保险时间为基础，研究区间分别检验前一年到后一年（列 1）与前一年到后两年（列 2）投资效率。以同行业内规模相近的没有购买责任险的公司为对照样本，投保责任险公司为研究样本。其中，*GAP* 为自然年与购买年份之差，*Diff\_RET*、*Diff\_FCF*、*Diff\_CAPX*、*Diff\_BM*、*Diff\_MV*、*Diff\_LEV* 分别代表购买责任险公司股票年收益率、自由现金流、净投资、账面市值比、市场价值、负债率等指标同对照组的差值。在表 8 中，若系数 *GAP\*Diff\_FCF* 显著为正，则说明过度投资与自由现金流存在显著相关性。在表 9 中，若系数 *GAP\*Diff\_CAPX* 显著为负，则说明过度投资导致投资者对公司预期变差，投资价值相关性下降。

表 8 假说 1 稳健性检验

	(1)	(2)
	<i>Diff_CAPX</i>	<i>Diff_CAPX</i>
<i>GAP</i>	0.018 (1.192)	0.016 (0.959)
<i>Diff_FCF</i>	-0.220*** (-4.183)	-0.220*** (-3.527)
<i>GAP*Diff_FCF</i>	0.205*** (3.323)	0.152** (2.123)
Constant	0.005 (0.391)	0.005 (0.329)
样本量	195	257
Adjusted R <sup>2</sup>	0.072	0.050
F值	6.005***	5.471***

注：（）内为 t 值，\*\*\*、\*\*、\* 分别表示 1%、5% 和 10% 的显著性水平。

表 8 的结果显示，*Diff\_FCF* 的回归系数显著为负，显著程度为 1%，说明与配对公司相比，投保公司在购买责任险之前代理问题较低，自由现金流引发的过度投资程度偏低；而 *GAP\*Diff\_FCF* 的相关系数显著为正，且显著程度为 1%，说明公司在购买责任险之后，过度投资同自由现金流相关性显著提高。可以认为，购买高管责任险促进公司过度投资，增加了代理成本。在表 9 中，*GAP\*Diff\_CAPX* 的系数均为负，且显著水平分别为 1% 和 5%，说明在投保高管责任险后其投资的价值相关性下降，投资效率下降。这些发现与本文的主要结果是一致的，即购买高管责任险降低了公司投资效率，投资价值相关性下降。

<sup>12</sup> 这里，配对规模主要基于年度资产总值；行业除制造业外，均采用一位数字分类；制造业采用取两位数字代码进行分类。研究样本与配对样本的资产总值差异不存在显著差异，本文采用的配对样本方法是有效的。

表 9 假说 2 稳健性检验

变量	(1) <i>Diff_RET</i>	(2) <i>Diff_RET</i>
<i>Diff_CAPX</i>	1.826* (1.956)	1.674* (1.763)
<i>GAP</i>	0.179** (1.974)	0.168* (1.918)
<i>GAP*Diff_CAPX</i>	-3.290*** (-2.968)	-2.269** (-2.200)
<i>Diff_BM</i>	0.074 (0.554)	0.148 (1.258)
<i>Diff_FCF</i>	0.567 (1.525)	0.546 (1.429)
<i>GAP*Diff_FCF</i>	-0.441 (-1.036)	-0.427 (-0.997)
<i>Diff_LEV</i>	0.604** (2.556)	0.494** (2.398)
<i>Diff_MV</i>	-0.179** (-2.361)	-0.176*** (-2.710)
Constant	0.008 (0.112)	0.008 (0.105)
样本量	195	257
Adjusted R-squared	0.093	0.062
F值	3.489	3.106

注：（）内为 t 值，\*\*\*、\*\*、\*分别表示 1%、5%和 10%的显著性水平。

当然选择配对样本的分析方法也存在一定的局限性。理想的配对分析方法，要求能够选择变量说明购买高管责任险的原因，而我们这里仅仅是用年度、行业、规模作为控制，难以确定潜在的遗漏变量对结论的可能影响。

综上所述，可以认为，在中国现有的制度环境下，上市公司投保高管责任险降低了高管预期的诉讼风险，弱化高管对项目投资价值的关注程度，降低了投资效率，不仅表现为公司过度投资的增加，而且削弱了投资的价值相关性。因此投保高管责任险，增加了中国上市公司的代理成本，降低了公司治理效率。

## 五、 结论

高管责任险作为一种特殊的保险业务，可以为公司和高管在面临诉讼及其经济责任方面提供经济保障。目前，大多数北美上市公司已经投保了高管责任险，相应的研

究涉及到高管责任险投保价格的决定因素，与公司治理的相关性及对财务决策行为等经济后果的影响。本文以中国特定的制度背景为基础，探讨了中国上市公司购买高管责任险的经济后果，特别是对公司投资行为的影响。本文以 2002-2012 年的中国上市公司为样本，从横截面和时间序列两个维度检验了投保高管责任险对公司投资决策的影响。研究表明，当公司投保高管责任险后，更倾向于将自由现金流进行过度投资，而且降低了公司的整体投资效率。这些结果表明，由于投保高管责任险有助于降低高管的诉讼风险和诉讼成本，使其更有可能采取低效率的投资决策，损害公司价值。在中国现有背景下，高管责任险并没有起到监督治理和有效保护中小投资者的作用，反而恶化了代理问题。

本研究检验了在中国制度背景下，投保高管责任险对公司投资及其价值相关性的影响。实证检验结果表明，投保高管责任险会促使公司进行过度投资，降低投资效率，增加公司的代理成本。在实践上，本研究也为在中国推广高管责任险的必要性提供了经验证据。既然目前高管责任险并不能够发挥降低高管风险，促进公司有效投资的作用，那么在中国市场中推广高管责任险的同时，还需要同时完善其他有效保护中小投资者的机制，才能发挥高管责任险降低高管风险，促进有效投资的积极作用。

“Open Access. This article is distributed under the terms of the Creative Commons Attribution License which permits any use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited.”

## 参考文献

- 郝颖、刘星，2011，“大股东自利动机下的资本投资与配置效率研究”，《中国管理科学》第 1 期，167-176。
- 郝颖、刘星、伍良华，2007，“基于内部人寻租的扭曲性过度投资行为研究”，《系统工程学报》第 2 期，128-133。
- 李鑫，2007，“自由现金流、现金股利与中国上市公司过度投资”，《证券市场导报》第 10 期，55-59。
- 刘昌国，2006，“公司治理机制、自由现金流量与上市公司过度投资行为研究”，《经济科学》第 4 期，50-58。
- 万华林、陈信元、朱凯，2012，“税制改革与公司投资价值相关性”，《经济研究》第 3 期，65-75。
- 王鑫，2009，“美国董事与高管责任保险制度探究及对我国的启示”，工作论文。
- 魏明海、柳建华，2007，“国企分红、治理因素与过度投资”，《管理世界》第 4 期，88-95。
- 徐晓东、张天西，2009，“公司治理、自由现金流与非效率投资”，《财经研究》第 10 期，47-58。

- Arrow, K. J. (1963), 'Uncertainty and the Welfare Economics of Medical Care', *American Economic Review* 53 (5): 941-973.
- Baker, T. and Griffith, S. J. (2007), 'The Missing Monitor in Corporate Governance: The Directors' & Officers' Liability Insurer', *The Georgetown Law Journal* 95 (6): 1795-1842.
- Boyer, M. M. (2014), 'Directors' and Officers' Insurance and Shareholders' Protection', *Journal of Financial Perspectives* 2 (1): 107-128.
- Chalmers, J. M. R., Dann, L. Y., and Harford, J. (2002), 'Managerial Opportunism? Evidence From Directors' and Officers' Insurance Purchases', *The Journal of Finance* 57 (2): 609-636.
- Chen, Q., Chen, X., Schipper, K., Xu, Y., and Xue, J. (2012), 'The Sensitivity of Corporate Cash Holdings to Corporate Governance', *Review of Financial Studies* 25 (12): 3610-3644.
- Chung, H. H. and Wynn, J. P. (2008), 'Managerial Legal Liability Coverage and Earnings Conservatism', *Journal of Accounting and Economics* 46 (1): 135-153.
- Core, J. E. (1997), 'On the Corporate Demand for Directors' and Officers' Insurance', *The Journal of Risk and Insurance* 64 (1): 63-87.
- Core, J. E. (2000), 'The Directors' and Officers' Insurance Premium: An Outside Assessment of the Quality of Corporate Governance', *The Journal of Law, Economics, and Organization* 16 (2): 449-477.
- Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., and Poterba, J. M. (1988), 'Financing Constraints and Corporate Investment', *Brookings Papers On Economic Activity* 1: 141-206.
- Holderness, O. G. (1990), 'Liability insurers as corporate monitors', *International Review of Law and Economics* 10 (2): 115-129.
- Holmstrom, B. (1979), 'Moral Hazard and Observability', *Bell Journal of Economics* 10 (1): 74-91.
- Jensen, M C. (1986), 'Agency costs of free cash flow, corporate finance and takeovers', *American Economic Review* 76 (2): 323-329.
- Jensen, M. C. (1993), 'The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems', *Journal of Finance* 48 (3): 831-880.
- Jensen, M. C. and Meckling, W. H. (1976), 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics* 3 (4): 305-360.
- Kang, C. (2011), 'Directors' and Officers' Insurance: Ordinary Corporate Expense or Valuable Signaling Device?', Thesis, Department of Economics, Stanford University.
- Kaplan, S. N. and Zingales, L. (1997), 'Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?', *Quarterly Journal of Economics* 112 (1):

169-215.

- Lin, C., Officer, M., Wang, R., and Zou, H. (2013), 'Directors' and officers' liability insurance and loan spreads', *Journal of Financial Economics* 110 (1): 37-60.
- Lin, C., Officer, M., and Zou, H. (2011), 'Directors' and officers' liability insurance and acquisition outcomes', *Journal of Financial Economics* 102 (3): 507-525.
- Myers, S. C. and Majluf, N. S. (1984), 'Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have', *Journal of Financial Economics* 13 (2): 187-221.
- O'Sullivan, N. (1997), 'Insuring the Agents: The Role of Directors' and Officers' Insurance in Corporate Governance', *The Journal of Risk and Insurance* 64 (3): 545-556.
- Richardson, S. (2006), 'Over-Investment of Free Cash Flow', *Review of Accounting Studies* 11 (2): 159-189.
- Wan, H. and Zhu, K. (2011), 'Is Investment-Cashflow Sensitivity a Good Measure of Financial Constraints?', *China Journal of Accounting Research* 4 (4): 253-270.
- Zou, H., Wong, S., Shum, C., Xiong, J., and Yan, J. (2008), 'Controlling-Minority Shareholder Incentive Conflicts and Directors' and Officers' Liability Insurance: Evidence from China', *Journal of Banking and Finance* 32 (12): 2636-2645.