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Directors' and Officers' Liability Insurance and Related-Party Transactions: Evidence from China

Hongyan Huang[a], Dunli Zhang[b], and Li Wang[b]

[a]School of Accounting, Fujian Jiangxia University, Fuzhou, China; [b]School of Accounting, Zhongnan University of Economics and Law, Wuhan, China

ABSTRACT

Using the data set of Chinese A-share listed enterprises, this paper discusses the impact of directors' and officers' liability insurance (hereinafter referred to as D&O insurance) on related-party transactions. We empirically find that D&O insurance positively associates with related-party transactions, and this conclusion still holds after robustness tests such as the DID approach, Heckman two-stage model, and propensity score matching. Mechanism analysis shows that D&O insurance promotes the occurrence of related-party transactions by improving the level of enterprise risk-taking. This positive correlation is more significant in enterprises audited by non-Big Four, non-state-owned enterprises, and samples with strong board independence. This paper not only complements the literature on the actual impact of D&O insurance from the perspective of operating activities, but also provides useful reference for regulating the governance of related-party transactions.

KEYWORDS

D&O insurance; related-party transactions; risk-taking

JEL

M10; M40; D21

1. Introduction

D&O insurance is a kind of professional liability insurance that considers directors, supervisors, and senior managers' civil liability to the company and third parties as the subject of insurance. When directors, supervisors, and senior managers are accused by shareholders or other stakeholders, the insurance company shall bear the corresponding civil liability and compensation following the contract. This can greatly reduce the risk faced by the enterprise, and thus D&O insurance is often regarded as the "helmet of the general." In practice, the coverage rate of D&O insurance has exceeded 90% in countries such as the U.S. and Canada, but it is still in the rapid development stage in China, which may be because Chinese investors are less motivated to file lawsuits and the legal system is relatively weak in punishing violations (Jia and Tang 2018; Wang et al. 2020). However, revolutions such as the amendment of the securities law, the establishment of Small and Medium-sized Investor Service Centers have led to increasingly strict external supervision. In this context, D&O insurance is again receiving the capital market's attention. As a financial tool for risk aversion, D&O insurance has had a profound impact on corporate governance and development. Under the background of the reality that more and more listed companies are purchasing D&O insurance, the main objective of this study is to explore the impact of D&O insurance on the decision-making of the company's business activities in China.

The role of D&O insurance as a risk transfer tool in corporate governance is controversial in existing studies. Some scholars argue that D&O insurance can attract more outstanding talents, and increase risk-bearing ability of the management (Hwang and Kim 2018), while others argue

CONTACT Li Wang wanglizz@163.com School of Accounting, Zhongnan University of Economics and Law, No. 182, Nanhu Avenue, East Lake High-tech Development Zone, Wuhan, Hubei Province 430073, China
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that D&O insurance reduces the deterrent effect of the law and induces more opportunistic behaviors of the management, which may lead to over-investment, etc (Li and Liao 2014). Although existing studies have explored the economic consequences of D&O insurance in terms of investment activities and financing activities, there is a relative lack of studies examining it from the direct perspective of operational activities, and no consistent conclusions have been reached (Lin et al. 2013). Specifically, as an important business practice closely related to investor protection, related-party transactions are relatively common in the Chinese capital market. Compared to market-based transactions, related-party transactions do not need to rely on external third parties, and the transaction can be directly manipulated through the negotiation with related parties. Therefore, the regulator always pays particular attention to the necessity and fairness of related-party transactions to determine whether the controlling shareholder tends to tunnel activities. According to the administrative punishment announcements issued by the China Securities Regulatory Commission (CSRC), the number of samples punished for related-party transactions in the past three years has reached 1,713. Under the strict regulatory environment, related-party transactions can more directly reflect the changes in the business risk-taking of enterprises (Usman et al. 2020). For this reason, this paper intends to discuss the role of D&O insurance in corporate governance from the perspective of related-party transactions. It is worth mentioning that in the context of the increasing popularity of D&O insurance, studying the impact of D&O insurance on related-party transactions is not only of great value in regulating related-party transactions but also valuable for further understanding the economic consequences of D&O insurance.

China provides an appropriate environment for us to investigate this issue. First, related-party transactions are more prominent in the Chinese capital market. On the one hand, China has a relatively concentrated ownership structure, and the agency problem between controlling shareholders and minority shareholders is more prominent (Dou et al. 2022). Controlling shareholders have stronger incentives to appropriate the interests of minority shareholders through related-party transactions. On the other hand, China's legal environment is relatively weak, with less strict enforcement and limited investor protection (Jiang, Lee, and Yue 2010). At the same time, the internal governance of enterprises is also weak, and an effective power restraint system has not yet been formed (Sun, Tong, and Wu 2013). The weak internal and external governance environment provides opportunities for controlling shareholders to engage in related-party transactions. As a result, China is more prone to breed related-party transaction problems. Second, in recent years, D&O insurance has developed rapidly in China, providing more variation samples. Since 2002, the relevant regulatory authorities have successively issued the "*Governance Guidelines for Listed Companies*," "*Certain Opinions on the Reform and Development of the Insurance Industry*," "*Opinions on the Reform of the Independent Director System of Listed Companies*," etc., aiming to reduce the risks in the normal performance of management through D&O insurance. Driven by the policy, more and more listed companies have started to purchase D&O insurance. Compared to the US market with more than 90% coverage, China provides a unique setting with more variation samples. At the same time, listed companies need to disclose the details of D&O insurance purchasing in the annual report or make announcements, which provides us with an opportunity to obtain D&O insurance data.

This paper takes Chinese A-share listed companies from 2007 to 2021 as the research sample to analyze the impact of D&O insurance on corporate related-party transactions. It is found that the related-party transactions increase significantly after the listed companies purchase D&O insurance. The mechanism analysis shows that D&O insurance can improve the risk-taking ability of enterprises, and then increase the occurrence of related-party transactions. Further analysis shows that the role of D&O insurance in promoting related-party transactions is mainly concentrated in the samples of non-Big Four audits, more independent boards of directors, and non-state-owned enterprises. The higher the coverage amount of D&O insurance, the more significant it is in promoting related-party transactions. In addition, D&O insurance increases both normal and abnormal related-party transactions.

The contributions of this paper mainly include the following aspects. First, this paper expands the research of D&O insurance in emerging markets. As D&O insurance is rooted in the Western market, the relevant research mainly focuses on the U.S. and the Canadian market, and relatively little research has been conducted in emerging development markets. Studies taking emerging markets as samples mainly focus on independent director performance, load spreads, and enterprise innovation (Jia and Tang 2018; Lin et al. 2013; Wang et al. 2020). This paper explores the impact of D&O insurance on corporate governance from a more direct perspective of related-party transactions, which enriches the relevant research of D&O insurance in emerging markets. Second, this paper enriches the research on the influencing factors of related-party transactions from the perspective of risk sharing. Current research on related-party transactions mainly focuses on the discussion of tunneling and propping effects and explores the influencing factors of related-party transactions from the perspectives of external regulatory changes and internal governance changes (Hope and Lu 2020; Lo, Wong, and Firth 2010). Under the background of the increasing popularity of D&O insurance, this paper enriches the relevant research from the perspective of insurance purchase and risk-taking. Compared to prior study, this paper, based on insurance theory, unveils the "black box" of how D&O insurance promotes related-party transactions from the perspective of risk-sharing. This provides a valuable supplement to existing literature.

2. Prior Literature and Hypothesis Development

2.1. Literature Review

The original purpose of enterprises purchasing directors and supervisors' liability insurance is to reduce the risk of executives and directors in business management decisions and to resolve liability disputes. The economic consequences of D&O insurance have been studied in much literature, but no consistent conclusion has been reached. On the one hand, D&O insurance has a risk transfer effect. Previous studies have found that enterprises with high financial leverage ratio and high growth are more likely to purchase D&O insurance for the consideration of risk control, and the purchase of D&O insurance can encourage the management of enterprises to accept certain projects with high risk and profitability (Core 1997). This risk transfer function can isolate the personal wealth of directors and supervisors from the litigation risk of the corporate litigation, giving the management more space to make decisions, and can attract more talented people to join (Priest 1987). Wang et al. (2020) argue that D&O insurance can increase the management's tolerance of R&D failure and thus promotes innovation investment. However, other studies have found that there is no significant correlation between the purchase of D&O insurance and the degree of management risk aversion (Boyer and Stern 2012). At the same time, it is worth noting that the risk transfer effect of D&O insurance can cut the deterrent effect and binding force of the law, which may reduce the cost of management's self-interested behaviors and induce more opportunistic behaviors. It has been found that the purchase of D&O insurance by enterprises is associated with a significant increase in the aggressiveness of corporate financial policies, a significant increase in the probability of financial restatement, and a decrease in accounting conservatism (Chalmers, Dann, and Harford 2002; Chung and Wynn 2008; Weng, Chen, and Chi 2017). From the perspective of external stakeholders, the purchase of D&O insurance is accompanied by higher debt cost, higher equity cost, lower stock liquidity, and worse market reaction to M&A announcements, etc (Lin et al. 2013). On the other hand, D&O insurance plays a supervisory role and is an effective external governance mechanism. O'Sullivan (1997) finds that enterprises with more costly external supervision are more inclined to resort to D&O insurance in order to monitor the management. To reduce the risk of shareholder litigation and compensation losses, insurance companies have the incentive to monitor the business prospects, management behaviors, and business activities of enterprises (Boyer and Stern 2012). At the same time, insurance companies have an information disadvantage. In order to reduce the degree of information asymmetry, insurance companies need to fully understand the operation of the insured entity, reasonably price premiums and improve insurance contracts (Boyer and Stern 2012).

Related-party transactions are characterized by factors such as concealment, complexity, and dual interests, and they are among the key concerns that Chinese capital market regulators focus on (Hwang, Chiou, and Wang 2013). Existing studies have found that related-party transactions can serve as not only a tool for resource appropriation by controlling shareholders, resulting in a "tunneling effect," but also as an effective contractual arrangement to reduce transaction costs and default risks while improving enterprise operational efficiency (Jian and Wong 2010; Kohlbeck and Mayhew 2017). In terms of the governance factors affecting corporate related-party transactions, it can be divided into external governance and internal governance. For the external factors, Chen, Cheng, and Xiao (2011) find that enterprises may manipulate earnings through related-party transactions to meet IPO performance criteria. Hope and Lu (2020) find that after the U.S. Securities and Exchange Commission mandates listed companies to disclose their governance policies on related-party transactions, related-party transactions are reduced. Jiang, Tian, and Zhou (2021) find that the deregulation of short-selling can increase analyst attention, etc., which can motivate the management to reduce detrimental related-party transactions and increase beneficial related-party transactions. Habib, Muhammadi, and Jiang (2017) find that politically connected enterprises are more likely to use related-party transactions as a means of tunneling. Bennouri, Nekhili, and Touron (2015) find that high-quality audits can reduce related-party transactions. For the internal governance factors, Lo, Wong, and Firth (2010) find that better internal governance can inhibit related-party transactions. High-quality internal controls can inhibit non-arm's length related-party transactions (Tong, Wang, and Xu 2014). From the perspective of compensation, Hope, Lu, and Saiy (2019) find that excess compensation of independent directors may increase related-party transactions. Al-Dhamari et al. (2018) find that internal audits can improve the reliability of related-party transactions and reduce the fees of external audits.

From the existing literature, it can be seen that the impact of D&O insurance on firms' operations may be two-sided. Part of the literature argues that D&O insurance can alleviate the responsibility that management needs to bear by transferring risks to a third party, thus increasing the risk-taking capacity of firms and making them more aggressive in investment and other financial decisions (Bradley and Chen 2011; Weng, Chen, and Chi 2017). On the contrary, another part of the literature argues that D&O insurance can produce governance effects through third-party supervision, alleviate agency problems, and make corporate operations more standardized and business decisions more objective (Yuan, Sun, and Cao 2016). However, it is still not clear how D&O insurance affects corporate-related party transactions, so our paper helps to enrich the research in related fields.

2.2. Hypothesis Development

For enterprises, related-party transactions are an essential component of their daily operations, often utilized to achieve objectives such as tax avoidance and earnings management (Chan, Mo, and Tang 2016; Kohlbeck and Mayhew 2017). Compared to market-based transactions, related-party transactions are more intricate and challenging to regulate when determining whether they adhere to the assumption of independent transactions. In scenarios where the external system is insufficient, and agency problems are prominent, related-party transactions are often employed as a tool to transfer resources to controlling shareholders (Habib, Muhammadi, and Jiang 2017), making them a focal point of capital market regulation. Some directors perceive related-party transactions directly as a source of risk and prefer to reduce them, even at the expense of economic benefits (Usman et al. 2020). Enterprises with more related-party transactions tend to incur higher audit fees (Habib, Jiang, and Zhou 2015), indicating certain risks and costs associated with these transactions. The decision to engage in related-party transactions reflects the risk preference of enterprises. As a crucial governance mechanism and specialized insurance tool, D&O insurance may not only enhance management's risk-bearing ability and induce opportunism motivation, potentially increasing the likelihood of related-party transactions but may also exert an external supervision effect, mitigating related-party transactions. This paper analyzes the potential relationship between D&O insurance and related-party transactions from the perspectives of risk-bearing and external supervision.

From the perspective of risk-taking, D&O insurance could potentially elevate related-party transactions. Firstly, based on insurance theory, D&O insurance can have a risk-hedging effect by reducing corporate risk to an acceptable level through risk-sharing (Cao and Narayanamoorthy 2014). To some extent, this can serve as an "umbrella" for enterprise management, relieving them from responsibility for their improper behavior and potentially leading to an increase in related-party transactions (Li et al. 2023). Secondly, D&O insurance can shield the personal wealth of directors, supervisors, and executives from litigation compensation, enhancing the security of normal performance (Shi, Sun, and Liu 2023). As a component of non-monetary compensation, D&O insurance can attract risk-tolerant talents from outside, encouraging increased investment in sub-optimal risky projects (Lin et al. 2013). Under procedural voting rules, an influx of risk-averse talent can improve the overall risk-taking capacity of enterprises. Thirdly, the research indicates that the supervisory function of independent directors weakens after enterprises purchase D&O insurance, evidenced by a reduction in board meeting attendance (Jia and Tang 2018). Independent directors, as a significant supervisory force in the corporate governance structure, play a crucial role in restraining related-party transactions (Lo, Wong, and Firth 2010). Weakened supervision by independent directors can potentially create more space for related-party transactions. In summary, with the enhancement of enterprises' risk-taking capacity, there may be a propensity for an increase in related-party transactions. Therefore, the following research hypotheses are proposed in this paper.

H1a: Enterprises that purchase D&O insurance have more related-party transactions.

From the perspective of external supervision, D&O insurance may reduce related party transactions. On the one hand, according to the stakeholder theory, the purchase of D&O insurance brings the external supervisory body of insurance institutions into the governance system and makes them become external stakeholders. Compared with other stakeholders, insurance companies, as financial institutions, have obvious supervisory advantages and can effectively restrain the behavior of directors and executives (Wang and Wu 2023). When an enterprise applies for insurance, third-party insurance companies have the incentive to conduct a comprehensive investigation of the operations and governance of the target enterprises, which serves as the basis for pricing (Boyer and Stern 2012). As related-party transactions are the focus of Chinese capital market regulation, insurance companies should also pay attention to the risks arising from related-party transactions. At the same time, in contrast to the risk transfer role that can only be reflected at the time of actual litigation, the supervisory role of D&O insurance works continuously at all stages of the insurance (Holderness 1990). The insurance companies are likely to minimize potential losses by setting up notification obligation clauses, exemption clauses, field research, etc. In other words, insurance companies can effectively verify corporate behavior and minimize unnecessary related-party transactions. On the other hand, the price of D&O insurance reflects the insurance companies' comprehensive evaluation of the insured enterprise (Cao and Narayanamoorthy 2014). More related-party transactions can enhance the difficulty of pricing for insurance companies, which may increase the purchase price of D&O insurance, thus constituting an additional cost of related-party transactions. Enterprises are more likely to reduce related-party transactions out of the need to reduce later premiums. As a result, this paper proposes the following competing research hypotheses.

H1b: Enterprises that purchase D&O insurance have fewer related-party transactions.

3. Research Design

3.1. Data Source

We take A-share listed companies in Shanghai and Shenzhen from 2007 to 2021 as the samples. The D&O insurance coverage data is obtained from the China Research Data Services Platform (CNRDS). Additionally, in order to ensure data accuracy, we manually cross-check the relevant data on D&O insurance with the listed companies annual reports and announcements. The data on related-party transactions and other financial variables are sourced from the China Stock Market and Accounting Research (CSMAR) database. The sample selection process is as follows: First, we exclude samples from ST and *ST listed companies. Second, we exclude samples from the financial and insurance industries. Third, we exclude samples with incomplete data on D&O insurance and related-party transactions. To eliminate the effects of extreme values, we winsorize all continuous variables at the 1% and 99% levels. Ultimately, the sample used in this paper consists of 28,788 firm-year observations from 3,577 companies.

3.2. Main Variable Definitions

3.2.1. Explanatory Variable: D&O Insurance

We adopt the approach used by Chen, Cheng, and Xiao (2011) to measure the D&O insurance by listed companies. Specifically, we adopt a dummy variable *DO* to measure D&O insurance, which equals 1 if a listed firm purchases D&O insurance for the current year in its announcements or annual reports and 0 otherwise.

3.2.2. Explained Variable:Related-Party Transactions

In China, related-party transactions encompass various types, including commodity trading, asset transactions, provision or receipt of services, agency, and other 21 categories. Among them, commodity trading and provision or receipt of services are the most common, significant, and voluminous types of related-party transactions (Zhang et al. 2023). In this study, drawing on the research by Jian and Wong (2010) and Tripathi, Raj, and Bhanu Sireesha (2022), the measurement of related-party transactions in listed companies is based on the ratio of the combined amount of related-party transactions in commodity trading and provision or receipt of services to total assets.

3.2.3. Control Variables

Drawing on the research models of Lin et al. (2013), this paper includes the following control variables, Company Age (*Age*), Company Size (*Size*), Debt-to-asset ratio (*Lev*), Audit opinion (*Opinion*), Current ratio (*Current)*, Management expense ratio (*Mfee*), Board independence (*Inde*), Board size (*Bsize*), Equity balance ratio (*Balance*), Managerial ownership ratio (*Mng*), Book-to-market ratio (*BM*), Employee concentration (*Staff*), Inventory turnover ratio (*Inv*), Return on equity (*ROE*), Ownership structure (*SOE*). Additionally, we control for year and industry fixed effects. Detailed variable definitions are provided in the notes in Table 1.

3.3. Regression Model

We construct the following model to investigate the association between D&O insurance and the related-party transactions:

$$RPT_{i,t} = \beta_0 + \beta_1 DO_{i,t} + \sum \beta_j Controls_{i,t} + \sum Year + \sum Industry + \varepsilon \tag{1}$$

Where $RPT_{i,t}$ represents the scale of related-party transactions in the enterprise, the subscripts i and t represent the firm and year, respectively. While *DO* represents the purchase of D&O insurance by the firm. *Controls* refer to a series of control variables, and ε represents the error term. Additionally,

Table 1. Variable definitions and descriptions.

Variable Name	Variable Symbol	Variable Definition
Related-party transactions	*RPT*	(trading amount of goods + trading for provision or receipt of services)/total assets
D&O Insurance	*DO*	A dummy variable, equals 1 if a listed firm purchases D&O insurance for the current year in its announcements or annual reports and zero otherwise.
Firm age	*Age*	ln(Current year—establishment year + 1)
Firm size	*Size*	ln(total assets)
Debt-to-asset ratio	*Lev*	Total liabilities/Total assets
Audit opinion	*Opinion*	Dummy, Assign a value of 1 if the company's financial report receives a standard audit opinion, zero otherwise.
Current ratio	*Current*	Current assets/Current liabilities
Management expense ratio	*Mfee*	Management expenses/Operating income
Board independence	*Inde*	Number of independent directors/Total number of directors
Board size	*Bsize*	ln(the total number of board members)
Equity balance ratio	*Balance*	Aggregate shareholding ratio of the top ten shareholders—Shareholding ratio of the largest shareholder
Management ownership percentage	*Mng*	Shares held by directors, supervisors, and senior executives/Total shares outstanding
Price-to-book ratio	*BM*	Book value/Total market value
Employee concentration	*Staff*	Year-end number of employees/Operating revenue of the year
Inventory turnover ratio	*Inv*	Inventory net value/Total assets ratio
Return on Equity	*ROE*	Net profit/Average balance of shareholders' equity
Ownership structure	*SOE*	Assign a value of 1 if the company is a state-owned enterprise, zero otherwise
Year	*Year*	Set 15 dummy variables for years starting from 2007
Industry	*Industry*	Set industry dummy variables based on the industry classification standard of the China Securities Regulatory Commission (CSRC) in 2012.

industry and year fixed effects are included in the model, and robust standard errors are clustered at the firm level to address potential heteroscedasticity.

4. Empirical Results

4.1. Descriptive Statistics

The descriptive statistics of the main variables are presented in Table 2. The average value of related-party transactions (*RPT*) is 0.029, indicating that related-party transactions account for an average of 2.9% of total assets. This is consistent with the findings of Zhang et al. (2023). The maximum value of

Table 2. Descriptive statistics.

Variables	*N*	mean	sd	min	p25	p50	p75	max
RPT	28788	0.029	0.076	0.000	0.000	0.002	0.017	0.495
DO	28788	0.083	0.276	0.000	0.000	0.000	0.000	1.000
Age	28788	2.843	0.347	1.792	2.639	2.890	3.091	3.466
Size	28788	22.150	1.276	19.86	21.220	21.960	22.870	26.090
Lev	28788	0.433	0.203	0.057	0.271	0.428	0.585	0.887
Opinion	28788	0.976	0.152	0.000	1.000	1.000	1.000	1.000
Current	28788	2.332	2.313	0.309	1.113	1.607	2.574	14.970
Mfee	28788	0.087	0.067	0.010	0.0420	0.070	0.109	0.389
Inde	28788	0.373	0.053	0.308	0.333	0.333	0.429	0.571
Bsize	28788	2.139	0.200	1.609	1.946	2.197	2.197	2.708
Balance	28788	23.100	12.880	2.100	12.660	22.000	32.350	54.800
Mng	28788	12.540	19.230	0.000	0.001	0.224	22.480	67.660
BM	28788	0.327	0.158	0.049	0.211	0.307	0.423	0.771
Staff	28788	1.409	1.163	0.065	0.613	1.116	1.838	6.579
Inv	28788	0.149	0.134	0.000	0.061	0.116	0.189	0.673
ROE	28788	0.071	0.112	−0.466	0.031	0.074	0.124	0.335
SOE	28788	0.426	0.494	0.000	0.000	0.000	1.000	1.000

RPT is 0.495, the minimum value is 0, and the standard deviation is 0.076, suggesting significant variation in the occurrence of related-party transactions among enterprises. The average value of *DO* indicates that 8.3% of the enterprises in the sample have purchased D&O insurance, aligning with the research by Kong et al. (2023). The results of other control variables are generally consistent with previous literature findings.

4.2. Baseline Results

As shown in Table 3, column (1) shows the regression result without any control variables, where the coefficient of DO is 0.008, significant at the 1% level, indicating that enterprises purchasing D&O insurance engage in more related-party transactions. The regression result with the control variables in column (2) shows that the coefficient of DO is 0.005, significant at the 5% level, indicating that the purchase of D&O insurance increases the level of enterprise risk-taking through risk transfer mechanisms, thereby promoting the occurrence of related-party transactions.Under the principal-agent relationship, as an insider, the management has a natural information advantage, which makes it

Table 3. Impact of D&O insurance on related-party transactions.

	(1)	(2)
Variables	*RPT*	*RPT*
DO	0.008***	0.005**
	(3.02)	(1.98)
Age		0.007**
		(2.32)
Size		−0.003**
		(−1.98)
Lev		0.002
		(0.25)
Opinion		0.003
		(0.94)
Current		−0.000
		(−1.05)
Mfee		−0.057***
		(−5.16)
Inde		0.002
		(0.16)
Bsize		0.006
		(1.48)
Balance		−0.000***
		(−2.67)
Mng		−0.000***
		(−4.46)
BM		−0.004
		(−0.85)
Staff		−0.003***
		(−3.78)
Inv		−0.005
		(−0.70)
ROE		0.011**
		(2.36)
SOE		0.028***
		(10.16)
Constant	0.022***	0.051*
	(4.72)	(1.79)
Industry/Year	YES	YES
N	28,788	28,788
R^2	0.0384	0.1316

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% Levels, respectively. Robust standard errors are given in parentheses.

difficult for insurance companies to play the role of external supervision. This means that the purchase of D&O insurance may cause the weakening of the constraint mechanism, reduce the risk awareness of the management, and provide more space for the discretionary behavior of the management. These results provide support for research hypothesis 1a.

From the perspective of control variables, the coefficient of *Age* is significantly positive, indicating that the older the enterprise is, the more related transactions may occur after the purchase of D&O insurance. At the same time, *ROE* is significantly positively correlated with related party transactions, indicating that the stronger the profitability, the easier to promote the occurrence of related party transactions. The coefficients of *Size*, *Mfee, Balance, Staff*, and *Mng* are negative, indicating that the larger the enterprise size, management expense ratio, equity balance degree, managerial shareholding ratio, and employee intensity, the less likely it is to produce related party transactions. The results of the control variables are generally consistent with the findings of Zhang et al. (2023).

4.3. Robust Test

We conduct a battery of robustness tests in the this study and more details can be found in the internet appendix. (1) We employ the revision of the *Civil Procedure Law* on August 31, 2012, as the exogenous shock and conduct the DID test. (2)The Heckman two-stage estimation method is further employed in our paper to address potential sample selection issues. (3) Propensity score matching is used to lessen selectivity bias. (4) The measure of the explained variable is replaced to reduce variable measure error, which is calculated as the total amount of related sales divided by total assets. (5) Other fixed effects are controlled. Together, we show that our findings regarding the positive associations between *DO* and *RPT* are robust.

5. Further Analysis

5.1. Mechanism Test

The preceding analysis mentioned that D&O insurance serves the function of dispersing potential liability risks, and companies purchasing D&O insurance can to some extent obtain "exemption" for decision-makers. Firstly, D&O insurance serves the function of risk transfer. Companies purchasing D&O insurance can transfer some responsibility and risk to the insurance company, thereby reducing the pressure on the company to bear risks. This transfer function can make the company's management bear less risk, with the insurance company assuming some responsibility in case of problems, making the management more willing to take risks, thereby promoting related-party transactions. Secondly, D&O insurance can serve as a non-monetary incentive to attract talent with higher risk tolerance to join the company. These talents are more willing to engage in higher-risk projects, including participating in related-party transactions. Finally, purchasing D&O insurance may weaken internal supervision within the company. With the alleviation of managers' concerns about personal liability, they are more likely to participate in related-party transactions without being constrained by internal supervision mechanisms such as independent directors. Therefore, the purchase of D&O insurance may increase the level of risk-taking within the company and consequently promote related-party transactions.

To validate the logic of this paper, we utilize three models with mediating effects to examine the relationship between the acquisition of D&O insurance, enterprise risk-taking levels, and related party transactions. Drawing from John, Litov, and Yeung (2008), we employ mean-adjusted ROA volatility over the last three years of the enterprise to gauge risk-taking (*Risk1*). Furthermore, to enhance the robustness of our findings, we incorporate the range value *Risk2* to assess risk-taking. *Risk2* is derived by computing the maximum minus the minimum value of ROA, adjusted for industry mean on a rolling basis. The regression results are presented in Table 4. Column (1) showcases the baseline regression outcome. Columns (2) and (4) depict the regression outcomes between the core

Table 4. Regression results of mediating effect.

	(1)	(2)	(3)	(4)	(5)
Variables	*RPT*	*Risk1*	*RPT*	*Risk2*	*RPT*
DO	0.005**	0.003**	0.005**	0.006**	0.005**
	(1.98)	(2.31)	(1.99)	(2.39)	(1.99)
Risk1			0.023*		
			(1.66)		
Risk2					0.012*
					(1.68)
Controls/Industry/Year	YES	YES	YES	YES	YES
N	28,788	28,354	28,354	28,354	28,354
R^2	0.1316	0.1746	0.1324	0.1735	0.1325

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% Levels, respectively. Robust standard errors are given in parentheses.

explanatory variable and the mediator variable. The coefficient for DO is 0.003 and 0.006, significantly positive at the 5% level. Columns (3) and (5) introduce mediator variables into the baseline regression results, revealing significant positivity in both the core explanatory variable and mediator variables. These regression results suggest that acquiring D&O insurance escalates enterprise risk-taking levels, thus fostering related-party transactions within the company.

5.2. Heterogeneity Analysis

5.2.1. Distinguish External Audit Quality

Enterprises that purchase D&O insurance have stronger incentives to engage in related-party transactions, but as an effective external governance mechanism, high-quality audits may narrow the space for enterprises to engage in related-party transactions. It has been found that related-party transactions are often used by enterprises as a tool to tunnel assets out of listed companies or for earning management, leading to lower-quality financial statements (Chen, Cheng, and Xiao 2011). On the one hand, to reduce the risk of material misstatement and minimize audit risk, auditors may spend more time verifying related-party transactions, and high-quality audits are more likely to detect problematic related-party transactions (Habib, Jiang, and Zhou 2015). On the other hand, in order to protect the audit reputation, high-quality auditors have incentives to encourage enterprises to minimize their involvement in related-party transactions (Bennouri, Nekhili, and Touron 2015). Compared to high-quality audit firms, low-quality audit firms may have relatively weaker motivation and capability to restrain related-party transactions. Therefore, we expect that high-quality audits can constrain enterprises' related-party transactions after purchasing D&O insurance, that is, the relationship that D&O insurance increases the related-party transactions mainly noticeable in the samples of low audit quality.

To verify the above logic, this paper refers to the study of Bennouri, Nekhili, and Touron (2015) and distinguishes audit quality according to whether the audit firm is an international Big Four accounting firm or not. The value is 1 if the enterprise's audit firm in the current year is a Big 4 accounting firm, otherwise, it is 0. The results of the grouped regressions are presented in column (1)(2) of Table 5. Column (1) is for the sample of Big 4 audits, and column (2) is for the sample of non-Big 4 audits. From the regression results, it can be seen that when the auditor is a non-Big 4 firm, the purchase of D&O insurance promotes the related-party transactions with a coefficient of 0.007 for *DO*, which is significantly positive at the 5% level. In the sample of Big 4 auditors, the relationship between *DO* and *RPT* is not significant. Also, the results of the difference between the two groups are significant at the 5% level.

5.2.2. Distinguish Board Independence

The independent directors are generally outsiders with financial, legal, and other professional knowledge structures, which not only have strong independence, but also can use their

Table 5. Regression result of different groups.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	*Aduit = 1*	*Aduit = 0*	*Indepent = 0*	*Indepent = 1*	*SOE = 1*	*SOE = 0*
DO	−0.008	0.007**	0.003	0.008**	0.004	0.005**
	(−1.21)	(2.42)	(0.88)	(2.37)	(1.02)	(2.01)
Controls/Industry/Year	YES	YES	YES	YES	YES	YES
N	1,564	27,224	18,020	10,768	12,255	16,533
R^2	0.1328	0.1282	0.1339	0.1300	0.1145	0.0379
P-value for the difference between groups	0.015**		0.000***		0.000***	

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% Levels, respectively. Robust standard errors are given in parentheses.

professional knowledge and experience to identify improper decisions in time and better play the role of internal governance. Lo, Wong, and Firth (2010) find that an independent board of directors can inhibit the occurrence of related-party transactions. However, it's worth noting that the scope of the D&O insurance covers independent directors, which may have an impact on the performance of independent directors' duties. It has been found that after purchasing D&O insurance, the risk exposure of independent directors becomes smaller, prompting them to reduce their supervision of the enterprises (Jia and Tang 2018). This implies that the supervision function of independent directors is weakened after the purchase of D&O insurance, which to some extent condones the related-party transactions. For samples with weaker board independence, the supervisory role played by independent directors in corporate governance remains relatively weak both before and after the purchase of D&O insurance, resulting in fewer variations of related-party transactions. For this reason, we expect the effect of increased related-party transactions by D&O insurance to occur mainly in the sample with greater board independence.

Referring to Lo, Wong, and Firth (2010), we measure board independence by the percentage of independent directors. If the proportion of independent directors is higher than the sample mean, the value of *Independence* is 1, otherwise, it is 0. The results of the grouped regressions are presented in column (3)(4) of Table 5. Column (3) is for the sample with low board independence and column (4) is for the sample with high board independence. From the regression results, it can be seen that when board independence is high, the purchase of D&O insurance promotes the related-party transactions, with a coefficient of 0.008 for *DO*, which is significantly positive at the 5% level. In the sample with low board independence, the relationship between *DO* and *RPT* is not significant. In addition, the results of the difference between the two groups are significant at the 1% level.

5.2.3. Distinguish Property Rights

In the context of China's economic transformation, there are clear differences between state-owned enterprises and non-state-owned enterprises in terms of risk-taking and motivations for related-party transactions. State-owned enterprises naturally enjoy government protection, and this protection may, to some extent, encourage the risk activities of state-owned enterprises, including those that have purchased D&O insurance and those that have not (Habib, Muhammadi, and Jiang 2017). In other words, the impact of D&O insurance purchase on the risk-taking of state-owned enterprises may be limited. On the other hand, non-state-owned enterprises face stronger financial constraints, which provide a stronger incentive to enhance financial performance through related-party transactions. In situations with limited resources, non-state-owned enterprises must rely on strong financial performance as support in order to obtain external funding. Therefore, this paper expects that the positive relationship between D&O insurance and related-party transactions should be more pronounced in non-state-owned enterprise samples.

For this purpose, we divide the sample into state-owned enterprises (*SOE* = 1) and non-state-owned enterprises (*SOE* = 0) according to the nature of enterprise ownership. The regression results are shown in column (5)(6) of Table 5. The regression results show that when the nature of ownership is non-SOE, the coefficient of *DO* of 0.005, which is significantly positive at the 5% level. In the SOEs, the relationship between *DO* and *RPT* is not significant. In addition, the results of the difference between the two groups are significant at the 1% level.

6. Conclusion

This paper contributes valuable insights to corporate governance theory by conducting a comprehensive analysis of the impact of purchasing D&O insurance on related party transactions in Chinese listed companies. The findings confirm the risk-transferring effect of D&O insurance, demonstrating that firms can enhance management's risk tolerance by investing in such insurance, thereby promoting related party transactions. This aligns with the risk transfer theory, asserting that firms, through insurance, can shift a portion of their economic losses, making them more willing to undertake risks.Heterogeneity analysis reveals that the facilitating effect of D&O insurance on related party transactions is more pronounced in non-Big4 audits, companies with more independent boards of directors, and non-SOEs. Improved corporate governance amplifies the role of D&O insurance, offering companies more effective tools for risk management.

The research conclusions carry significant policy implications. Firstly, the study affirms that D&O insurance serves a risk transfer function, enhancing the safety of directors and supervisors in their roles. However, the current adoption rate of D&O insurance in China lags behind other countries, and its full potential remains unrealized. Recognizing the immaturity of D&O insurance products in China, relevant authorities should focus on refining its design, including considerations such as premiums, compensation limits, and indemnity clauses, and bolster standardized management practices. By enhancing the availability of the product, the incentive for listed companies to invest in D&O insurance can be further stimulated. Secondly, while D&O insurance facilitates risk transfer, it may also induce management opportunistic behavior, leading to abnormal related-party transactions for resource appropriation. The paper concludes that reinforcing external audits and augmenting the responsibilities of external independent directors can mitigate this behavior to some extent. Hence, fortifying internal and external governance, elevating audit quality, and urging independent directors to fulfill their duties can safeguard the interests of the company and its shareholders, ensuring the effective utilization of D&O insurance. Given the intensified external regulations resulting from reforms such as the revision of securities laws and the full registration system, it is advisable to continue promoting the development of regulations and systems. This will contribute to fostering a healthier and more transparent corporate governance environment, facilitating the optimal utilization of D&O insurance for managing enterprise risks.

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