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Article

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The impact of the Social Security Fund on auditor litigation risk

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ABSTRACT

In this study, we examine the effect of the Social Security Fund on auditor litigation risk. Using audit fees as a proxy for auditor perceptions of litigation risk, we find that the Social Security Fund significantly reduces auditor litigation risk. Furthermore, we show that the Social Security Fund influences auditor litigation risk through reducing both the audit risk and the business risk of public companies. In addition, the impact of the Social Security Fund for reducing auditor litigation risk is more obvious in the group of firms with low levels of internal governance, which indicates that the Social Security Fund plays an important governance role as a high-quality institutional investor. In summary, we verify that the Social Security Fund, when acting as an institutional investor, plays an important role in corporate governance, and that it helps to reduce auditor litigation risk. Our results provide empirical support for expanding the governance role of the Social Security Fund as an institutional investor in China's A-share market.

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1. Introduction

The National Social Security Fund is involved in many major programs, such as old-age pensions, medical insurance, unemployment benefits, employment injury insurance, and maternity insurance, all of which are important for protecting the national economy, people's livelihoods, and social stability (Li et al., 2018). As of the end of 2018, the Social Security Fund held a total of 1.75 trillion RMB, and 208.37 billion RMB of that sum was invested in China's capital market. The Social Security Fund has gradually become one of the most important institutional investors in the capital market (Li et al., 2018). Unlike institutional investors that gain benefits through short-term trading, the Social Security Fund adheres to the principles of long-term, value-oriented, responsible management of investments. However, up to this point, the role of the Social Security Fund in the capital market has remained unclear. In 2009, the State Council of China issued a statement called the "Implementation Measures for the Transfer of Partial State-owned Shares in the Domestic Securities Market to Enrich the National Social Security Fund." This statement stipulated that although the Social Security Fund holds state-owned shares, it enjoys the right to receive and dispose of those shares, but it should not interfere with the daily operations of the listed companies' management.¹ However, the management teams of the Social Security Fund have a high level of professionalism, and they adhere to a philosophy of long-term value investment. The literature shows that long-term institutional investors prefer to monitor firms internally (e.g., Chen et al., 2007; Pukthuanthong et al., 2017). As is consistent with this view, Huiman Yi, the chairman of the China Securities Regulatory Commission, expresses high expectations that the Social Security Fund will play a helpful role in optimizing investor structure, maintaining stable market development, and improving the market's operational efficiency. He hopes that Social Security Fund managers can continue to apply their professional advantages and contribute to the high-quality development of China's capital market. Therefore, the role of the Social Security Fund in China's capital market is a question worthy of empirical examination.

In the literature, scholars mainly focus on the economic influence of the Social Security Fund, such as its effects on firm value (Fan et al., 2009), the quality of earnings information (Tang, 2011; Li et al., 2018), and dividend policy (Jin et al., 2016). However, few studies discuss the effect of the Social Security Fund on auditors' behavior. In recent years, with the improvement of legal system norms in China's capital market, the litigation risk faced by auditors has increased. In 2006, the new *Securities Law* and the new *Company Law* took effect at the same time. These laws explicitly required auditors to bear joint and several liability for losses caused to investors by false records, misleading statements or major omissions. For example, the Warren accounting firm was first judged to be liable for civil damages because of fraud committed by the Lantian corporation (stock code: 600709). These laws have caused the risk of auditors' litigation to increase over time. According to the first-instance judgment data on accounting firms as defendants in civil cases from 2007 to 2017, as reported on the China judgment document network,² the number of cases in which accounting firms (or auditors) have been sued in China has been increasing year by year. For example, there were nearly 250 such lawsuits in 2017. In the case of the securities misrepresentation liability dispute involving Shanghai Da Zhihui Co., Ltd. (in which BDO China Shu Lun Pan's CPAs were accused of violating provision No. 173 of the securities law³), the accounting firm and auditors were involved as co-defendants in a total of 112 lawsuits.

Clearly, auditors need to provide reasonable assurance for the fairness of their clients' annual reports, and they must bear the corresponding risks of potential litigation (Simunic and Stein, 1996; Johnstone, 2000; DeFond and Zhang, 2014). Therefore, it is worthwhile to examine the role that the Social Security Fund plays in external governance, and to do so from the perspective of auditors. Institutional investors are likely to become the main plaintiffs in lawsuits, especially when the lawsuits are related to financial information, or when the accounting firm is a co-defendant (Cheng et al., 2010). When institutional investors hold shares of public companies, the litigation risk faced by auditors is increased (Badertscher et al., 2014; Abbott

¹ http://www.csrc.gov.cn/pub/newsite/ssb/ssffg/xggzjwj/200906/t20090624_108138.html.

² <http://wenshu.court.gov.cn>.

³ Provision No. 173 of the Securities Law states that "Securities service agencies shall verify the authenticity, accuracy, and completeness of audit reports, asset evaluation reports, financial advisory reports, credit rating reports, or legal opinions and other documents for securities business activities such as issuance, listing, and trading of securities."

et al., 2017; Cassell et al., 2018). The Social Security Fund is the backbone of institutional investors in China's capital market. Therefore, when this fund holds shares in listed companies, the auditor's perception of litigation risk tends to increase. However, the Social Security Fund, as an independent, long-term institution, can play an active role in monitoring listed companies (Brickley et al., 1988; Cornett et al., 2007). Evidence shows that the Social Security Fund holdings improve a company's earnings quality and reduces the likelihood of financial restatements (Tang, 2011; Li et al., 2018), thereby reducing the litigation risk. Therefore, the objective of this study is to explore the governance role of the Social Security Fund from the perspective of auditors.

To pursue this inquiry, we collect data on Chinese A-share listed companies from 2007 to 2017, and we test the impact of the Social Security Fund holdings on auditor litigation risk. The empirical results show that this fund significantly reduces the litigation risk, as the audit risk and the clients' business risk are decreased. Furthermore, we conduct a cross-sectional test based on a listed company's corporate governance index, which is constructed by the principal component analysis method. The results of this test show that the Social Security Fund has a more significant impact on the litigation risk in the group of firms with lower levels of internal governance. This finding supports the suggestion that the Social Security Fund plays a helpful monitoring role. Next, we examine the impact of endogeneity on our results. We perform this analysis because the Social Security Fund prefers to invest in blue chip stocks, and this tendency may affect auditor litigation risk. To address this concern regarding endogeneity, we use the Heckman two-stage regression and the propensity score-based matching (PSM) model. In addition, we lag the Social Security Fund by one period and replace the control variables. After the robustness tests are performed, the results remain unchanged, which indicates the robustness of our conclusions.

Our study makes several contributions. First, it enriches research related to the governance effect of the Social Security Fund and provides a new research perspective. The literature mainly focuses on the effects that stock holding of the Social Security Fund has on firm value (Fan et al., 2009), earnings quality (Tang, 2011; Li et al., 2018), and dividend policy (Jin et al., 2016). Few studies explore the economic impact of the Social Security Fund from the perspectives of the other stakeholders of listed companies. To better understand the role of the Social Security Fund, we examine its impact on auditor litigation risk.

Second, our study extends the research on the impact of institutional investors on auditor litigation risk. The Social Security Fund is an important type of institutional investor, which is significantly different from the other kinds of institutional investors. Therefore, studying the relationship between the Social Security Fund and auditor litigation risk enriches the literature on institutional investors and auditor litigation risk. Badertscher et al. (2014), Abbott et al. (2017), and Cassell et al. (2018) present evidence that institutional investors can significantly increase auditor perceptions of litigation risk. However, the results of our study show that the Social Security Fund reduces the litigation risk.

Finally, our study provides empirical evidence supporting the expanding the role of the Social Security Fund for promoting higher-quality development of the capital market. Fan et al. (2009) believe that the Social Security Fund has a negative effect on corporate value, but Tang (2011) and Li et al. (2018) find that the Social Security Fund improves the earnings quality of listed companies. Thus, the literature fails to reach a consistent conclusion on the governance role of the Social Security Fund in the capital market. Our study investigates the perspectives of auditors and finds evidence that the Social Security Fund reduces auditor litigation risk. Our study also provides empirical evidence that the Social Security Fund plays an active governance role in the capital market.

The next section provides a literature review and develops the study's hypotheses. Section 3 explains our research design. In Section 4, we present a description of the sample and report our main findings. The results of robustness tests are reported in Section 5, and the findings from additional tests are given in Section 6. We offer our conclusions in Section 7.

2. Literature review and hypotheses development

2.1. Literature review

2.1.1. The economic effects of the Social Security Fund

Most of the evidence on the effects of the Social Security Fund holdings centers on its economic consequences. Although the Social Security Fund is a long-term investor, it has the incentive and the capability to monitor listed companies (Chen et al., 2007), but the incentive mechanism of this fund is decoupled from performance and is affected by political and social pressures. Furthermore, the business objectives of the Social Security Fund can be quite different from those of public companies. Thus, the Social Security Fund holdings can have negative effects on the market values of public companies (Fan et al., 2009). However, in the longer term, the Social Security Fund tends to significantly decrease earnings management behavior by public companies (Tang, 2011). Following Tang (2011), Li et al. (2018) use the financial restatements of listed companies as a proxy for earnings quality. They find that the Social Security Fund significantly reduces the likelihood of companies issuing financial restatements. This finding confirms the positive effect that the Social Security Fund has on the earnings quality of public companies. However, the Social Security Fund can play this role only under certain conditions (Tang and Wang, 2018). Although the fund successfully avoids system risks in the course of its investment activities, the absolute numbers of its investment losses are still large. Moreover, the fund's investments show no direct relationship between the period of shareholding and the investment risk, which indicates that this fund has not yet conducted its stock purchase and sale operations on the basis of risk analysis (Tang and Zhai, 2014). A positive correlation is found between Social Security Fund investment and company dividends, which reflects the behavior of both the demand side (from the Social Security Fund) and the supply side (from the listed companies). Public companies formulate their dividend policies based on their holdings of the Social Security Fund, and the Social Security Fund selects stocks by considering the dividend policies of listed companies over their previous years (Jin et al., 2016).

Overall, the literature fails to reach a consistent conclusion on the role of the Social Security Fund in corporate governance.

2.1.2. Previous evidence on institutional investors and auditor litigation risk

Given the potential costs, it is important for auditors to evaluate the factors that drive their litigation exposure in public company audits so that they can plan and price their audits in ways that keep their exposure within reasonable bounds (Cassell et al., 2018). Several studies have discussed two possible countermeasures. One countermeasure is to increase the investment in auditing or to deploy more experienced auditors to prevent the possibility of potentially significant misstatements (Chalmers, 2013; Overend, 2013). The second countermeasure is to charge a risk premium, which can be used as insurance against potential litigation risk in the future (Pratt and Stice, 1994; Simunic and Stein, 1996; DeFond and Zhang, 2014). Both of these measures result in higher audit fees. Consistent with this basic theory, Simunic and Stein (1996), Hay et al. (2006), and Venkataraman et al. (2008) find that companies in industries at high risk of litigation tend to have higher audit fees. Institutional investors are likely to be the main plaintiffs, especially when the lawsuits are related to financial information, or when the accounting firm is a co-defendant (Cheng et al., 2010). When institutional investors hold shares of public companies, the litigation risk faced by auditors tends to increase (Badertscher et al., 2014; Abbott et al., 2017; Cassell et al., 2018). In other words, the client's ownership structure has a significant influence on auditor litigation risk.

In general, the literature suggests that having institutional investors increases auditor perceptions of litigation risk (Simunic and Stein, 1996; Hay et al., 2006; Venkataraman et al., 2008; Badertscher et al., 2014; Cassell et al., 2018). However, the effects that different types of institutional investors have on auditor litigation risk may vary considerably. Unlike short-term institutional investors that buy and sell quickly, institutional investors with long-term investment strategies and no business dealings with the investee companies tend to have more significant monitoring effects on public companies (Chen et al., 2007). As the Social Security Fund is one of the most important institutional investors in the capital market, this fund conducts investment operation management in accordance with the principles of prudent investment, safety first, risk control, and increased returns. These investment principles can play an important role in optimizing investor structures,

maintaining stable market development, and improving the efficiency of market operations. Within the Chinese market environment, can the Social Security Fund play an active governance role? How does this fund affect the litigation risk faced by auditors? Our objective in this study is to answer these questions.

2.2. Hypotheses development

When auditors provide audit services for public companies, they face a multitude of risks related to their engagement, including audit risk and clients' business risk (Johnstone, 2000; Stanley, 2011; Zhai et al., 2017; Cassell et al., 2018). Audit risk mainly concerns the degree to which auditors are diligent and responsible in maintaining their independence while providing audit services, as well as the potential major errors and frauds of the audited financial system are disclosed in the audit report. Business risk mainly concerns the danger that the audited client may face operating losses or bankruptcy (American Institute of Certified Public Accountants [AICPA], 1983; Morgan and Stocken, 1998; Bell et al., 2001). In some audit litigation cases, the auditors perform their examinations in accordance with generally accepted auditing standards and report appropriately on those financial statements, yet they are still exposed to loss or injury to their professional practice due to litigation (AICPA, 1983). Therefore, given the potential hazards, auditors need to fully assess their clients' risks, develop an audit plan that matches those risks, and charge corresponding audit fees (DeFond and Zhang, 2014; Cassell et al., 2018). Badertscher et al. (2014) find that the audit fees charged to firms with public equities are 20–22% higher than fees charged to similar companies that only have public debt. This premium is mainly caused by the differing litigation risk related to different ownership structures. Moreover, institutional investors are more likely to be lead plaintiffs in lawsuits, especially when the lawsuits are related to financial information, or when the accounting firms are named as co-defendants (Cheng et al., 2010). Thus, when a company's stock is held by institutional investors, the auditors perceive higher risks of litigation, and they charge higher audit fees to compensate for that increased risk (Abbott et al., 2017; Cassell et al., 2018).

As an important capital market participant, the Social Security Fund is related to the national economy, to people's livelihoods, and to overall social stability. Throughout the past several decades, the investment and operation activities of the Social Security Fund have successfully avoided systemic risks. However, the absolute numbers of investment losses are still large (Tang and Zhai, 2014). According to "The Social Security Fund Annual Report" released in June 2017, the total assets of the fund were 2.04 billion RMB by the end of 2016, but the investment yield in that year was only 1.73%, which was far lower than the 8.37% average of the fund's annual returns since its establishment (Li et al., 2018). In addition, the report indicated that the Social Security Fund has not operated in accordance with the principles of investment security and profitability, nor has it fully conducted its stock purchase and sale operations on the basis on investment risk analysis (Tang and Zhai, 2014). The effective selection of investment objects is related to how well a fund realizes its investment objectives, and the financial information on listed companies plays an important role in a proper investment decision-making process. Thus, if the Social Security Fund suffers losses due to using low-quality financial information when investing in a particular firm, then the auditor, as the "gatekeeper" for the firm's financial information, faces higher risks of litigation. Thus, we predict that when a client's stock is held by the Social Security Fund, that client's auditors tend to perceive an increased risk of litigation. To test this suggestion, we propose hypothesis H1a, as follows:

H1a: *Ceteris paribus*, when the Social Security Fund holds shares of public companies, its auditors tend to perceive higher litigation risk.

Another possibility is that the Social Security Fund acts as an independent institution making long-term investments, and therefore it specializes in monitoring and influencing efforts, rather than in trading. In playing this external governance role, the fund may have an important effect in curbing the managers' short-sighted behavior (Harford et al., 2018). The Social Security Fund may have this effect by participating in corporate governance through shareholder proposals and other channels (Gillan and Starks, 2000). First, we consider that the Social Security Fund operates as a long-term investment vehicle, and that it has no direct business dealings with listed companies. In that case, the fund consciously seeks to reduce speculation and

short-term investment, and this is the essential difference between the Social Security Fund and other institutional investors (Li et al., 2018). Second, we suggest that the Social Security Fund management teams are more professional than the teams of other institutional investors, and this greater professionalism is conducive to playing an external monitoring role. After all, fund managers for the Social Security Fund need to meet higher requirements regarding their capabilities for overseeing operations and controlling risks. In addition, the Social Security Fund is usually one of the top 10 shareholders in the listed companies. This level of investment provides a favorable condition for the Social Security Fund to play an active role in monitoring and advising on important corporate decisions (Cornett et al., 2007). Studies show that independent long-term investors are motivated and have the capability to play active supervisory roles in companies (e.g., Gillan and Starks, 2000; Chen et al., 2007; Harford et al., 2018). In examining the long periods of time before and after the Social Security Fund invested in numerous listed companies, it can be seen that these companies' earnings management behavior decreased significantly (Tang, 2011), and their earnings quality has improved (Li et al., 2018). Therefore, we expect that the Social Security Fund can reduce the litigation risk faced by auditors through exerting its capacity for external governance. On the basis of the above-described analysis, we propose hypothesis H1b as follows:

H1b: *Ceteris paribus*, when the Social Security Fund holds shares of public companies, the auditors tend to perceive lower litigation risk.

3. Research design

3.1. Sample selection

We select Chinese A-share listed companies from 2007 to 2017 as the research sample. The institutional investor data and the financial data used in this study are derived from the China Stock Market and Accounting Research (CSMAR) database. CSMAR is widely used in the literature (e.g., Piotroski et al., 2015; Li et al., 2017; He et al., 2018; Lennox et al., 2018). We exclude firms from financial industries and firms with missing control variables. Our final sample has 17,830 observations for our main test. In addition, all continuous variables are winsorized at the top 1% and bottom 99% levels to reduce the possible impact of outliers on the estimation results.

3.2. Empirical model and variable definition

We use multiple regression analysis to test the research hypotheses proposed in the previous section. With reference to the literature (Stanley, 2011; Badertscher et al., 2014; Cassell et al., 2018), we use model (1), shown below, to empirically test the effect of the Social Security Fund holdings on auditor litigation risk.

$$\begin{aligned} \text{LitigationRisk} = & \beta_0 + \beta_1 \text{SSH} + \beta_2 \text{OI} + \beta_3 \text{Cur} + \beta_4 \text{Lev} + \beta_5 \text{Liq} + \beta_6 \text{Rev} + \beta_7 \text{Inv} + \beta_8 \text{Size} + \beta_9 \text{MB} \\ & + \beta_{10} \text{ROA} + \beta_{11} \text{Big4} + \beta_{12} \text{Loss} + \beta_{13} \text{Dual} + \beta_{14} \text{Indexp} + \beta_{15} \text{SOE} + \beta_{16} \text{Growth} \\ & + \beta_{17} \text{CFO} + \beta_{18} \text{Abs_DA} + \text{Year} + \text{Industry} + \varepsilon \end{aligned} \quad (1)$$

Prior theoretical and empirical research finds that the auditor's assessment of the client's business risk plays an important role in audit pricing (e.g., Simunic, 1980; Pratt and Stice, 1994). Therefore, following the literature (Badertscher et al., 2014; Cassell et al., 2018), we use audit fees to proxy for auditor litigation risk. Our first variable of interest, SSH, is a dummy that indicates whether the company's stock is held by the Social Security Fund in the current year. Consistent with the findings of Li et al. (2018), we reason that if a listed company's stock is held by the Social Security Fund in a given year, SSH equals 1, and otherwise it is set to 0. In addition, the role of institutional investors in monitoring depends on the shares they hold (Chen et al., 2007). Therefore, we apply another two proxies (SSF and SSFH). Specifically, if the Social Security Fund ranks in the top 10 of a company's shareholders, SSF takes a value of 1, and 0 otherwise. SSFH equals the natural logarithm of 1 plus the number of social security fund shareholders among the top ten sharehold-

ers at the end of the fiscal year. In accordance with H1a, we predict that β_1 will be positive and significant, as we expect that the Social Security Fund holdings increase the litigation risk. In accordance with H1b, we predict that β_1 will be negative and significant, as we expect that the Social Security Fund plays a monitoring role.

Following the literature (DeFond and Zhang, 2014; Badertscher et al., 2014; Cassell et al., 2018; Reid et al., 2019), we control the following variables in the model: the percentage of shares held by other institutional investors (OI), current ratio (Cur), leverage (Lev), current assets ratio (Liq), receivable and inventory intensity (Rec and Inv), natural logarithm of total assets (Size), market-to-book ratio (MB), accounting performance (ROA), auditor type (Big4), earnings below zero (Loss), chairman and general manager dual rights (Dual), proportion of independent directors (Indexp), state-owned enterprises (SOE), firm growth (Growth), cash flow from operations (CFO), and accounting information quality (Abs_DA). We also control the year and industry fixed effects. Furthermore, we use the “cluster” method at the company-annual level to adjust the standard error of the coefficient estimates (Petersen, 2005). Detailed definitions of the variables are presented in Table 1.

4. Empirical results

4.1. Descriptive statistics

Table 2 shows that our sample is distributed unevenly across industries. As we can see in the table, the Social Security Fund has its largest investments in Manufacturing, followed by Accommodation and Catering, Transportation, Storage and Postal Services, Electric, Gas, and Water, and in Real Estate.

Table 3 shows the descriptive statistics. Our final sample consists of 17,830 firm-year observations from 2007 to 2017. We can see that the average of audit fees (Ln_Fee) is 13.557. On average, 24.3% of each firm’s shares are held by the Social Security Fund (SSH), and 21.0% of our sample firms have the Social Security Fund as one of their top 10 shareholders (SSF). This finding indicates that the Social Security Fund has become more extensively involved in China’s capital market over time, and that it holds important positions

Table 1
Variable definitions.

Variable	Definition
Abs_DA	A measure of earnings management, which is computed as the absolute value of discretionary accruals, as estimated by using the modified Jones model.
Big4	Indicator variable that equals 1 if the company is audited by a Big 4 firm in year t , and 0 otherwise.
CFO	Cash flow from operations divided by total assets at the end of the year.
Cur	The percentage of current assets over current liabilities.
Dual	Indicator variable that equals 1 if the chairman and the CEO are the same person, and 0 otherwise.
Effort	The natural logarithm of calendar days between the fiscal year-end and the audit report date.
Growth	The percentage change in sales (scaled by total assets) over the previous year.
Indexp	The ratio of the number of independent directors to the total number of directors.
Inv	Total inventory divided by total assets at the end of the year.
Lev	Total debt divided by total assets at the end of the year.
Liq	The percentage of current assets over total assets.
Ln_Fee	The natural logarithm of total audit fees.
Loss	Indicator variable that equals 1 if the company’s net income is less than 0, and 0 otherwise.
MB	Market value divided by book value at the end of the year.
OI	The percentage of shares held by other institutional investors (%).
Rec	Total accounts receivable divided by total assets at the end of the year.
ROA	Net income divided by total assets.
Size	The natural logarithm of total assets at the end of the year.
SSF	Indicator variable that equals 1 if the Social Security Fund ranks among the firm’s top 10 shareholders in the current year, and 0 otherwise.
SSFH	The natural logarithm of 1 plus the number of social security fund shareholders among the top ten shareholders at the end of the fiscal year.
SSH	Indicator variable that equals 1 if the company’s stock is held by the Social Security Fund in the current year, and 0 otherwise.
SOE	A dummy variable that equals 1 if the firm is a state-owned enterprise, and 0 otherwise.

Table 2
Industry distribution.

Industry	SSH = 0	SSH = 1	Total
Agriculture, Forestry, and Fishing	204	85	289
Mining	365	138	503
Manufacturing	8,585	2670	11,255
Electric, Gas, and Water	458	179	637
Construction	319	130	449
Transportation, Storage, and Postal Services	825	261	1086
Information Technology	525	135	660
Wholesale and Retail Trades	69	17	86
Accommodation and Catering	647	267	914
Real Estate	803	170	973
Leasing and Business Services	134	56	190
Scientific Research, Technical Services, and Geological Survey	57	32	89
Water Conservancy, Environment, and Public Facilities Management	111	60	171
Residents Service and Other Services	24	0	24
Education	2	1	3
Health, Social Security, and Social Welfare	6	22	28
Culture, Sport, and Entertainment	111	89	200
Public Administration	249	24	273
Total	13,494	4,336	17,830

Table 3
Descriptive statistics for the full sample.

Variable	Mean	Std.	Min	P50	P75
Abs_DA	0.065	0.073	0.000	0.042	0.082
Big4	0.065	0.247	0.000	0.000	0.000
CFO	0.044	0.075	-0.194	0.044	0.088
Cur	2.269	2.434	0.239	1.532	2.428
Dual	0.225	0.418	0.000	0.000	0.000
Effort	4.488	0.262	3.401	4.500	4.700
Growth	0.226	0.553	-0.556	0.126	0.302
Indexp	0.372	0.055	0.091	0.333	0.400
Inv	0.160	0.152	0.000	0.119	0.202
Lev	0.452	0.211	0.052	0.453	0.616
Liq	0.557	0.213	0.082	0.571	0.719
Ln_Fee	13.557	0.687	12.346	13.459	13.874
Loss	0.083	0.276	0.000	0.000	0.000
MB	2.269	2.066	0.201	1.668	2.867
OI	4.918	5.158	0.000	3.371	6.960
Rec	0.135	0.115	0.000	0.110	0.202
ROA	0.041	0.053	-0.176	0.037	0.067
Size	22.152	1.280	19.639	21.991	22.895
SSF	0.210	0.407	0.000	0.000	0.000
SSFH	0.275	0.602	0.000	0.000	0.000
SSH	0.243	0.429	0.000	0.000	0.000
SOE	0.456	0.498	0.000	0.000	1.000

in the equity structures of numerous companies. Forty-five percent of the firms are controlled by states (or are SOEs). This percentage is very close to the percentage of SOEs as found by CSMAR (42.1%). The mean of Big4 (0.065) indicates that 6.5% of our sample is audited by Big4 accounting firms. In addition, 8.3% of our sample has negative net income.

Fig. 1 shows the trends of the Social Security Fund holdings from 2007 to 2017. We can see that since 2007, the number of companies held by the Social Security Fund has shown an upward trend. Although the number

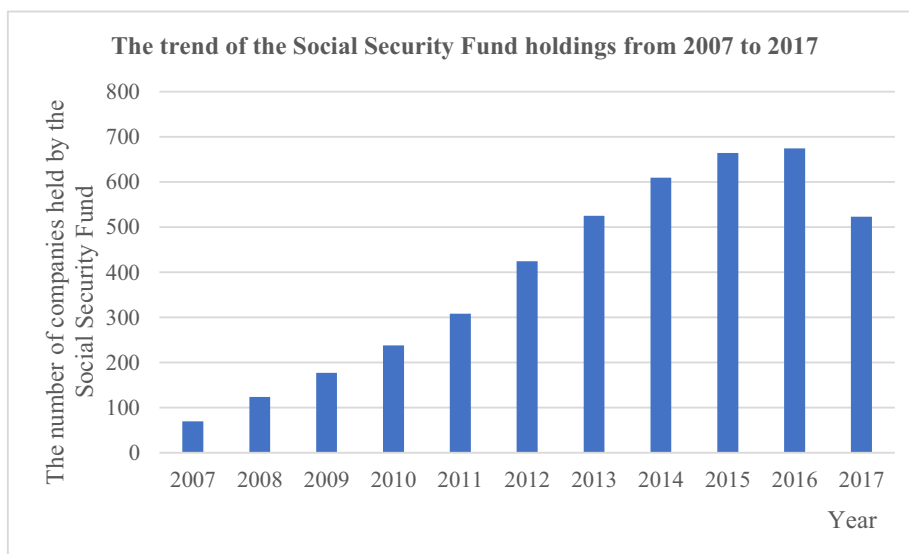


Fig. 1. The trend of the Social Security Fund holdings.

declined slightly in 2017, it has in general increased gradually, which indicates that the Social Security Fund's participation in China's A-share market is expanding.

4.2. Baseline regression

Table 4 shows the regression results of model (1). As shown in this table, the regression coefficients on the Social Security Fund (SSH, SSF, SSFH) are all negative and significant at the p less than 0.05 level. These results provide evidence that the Social Security Fund significantly reduces the risk of litigation perceived by auditors. Thus, our hypothesis H1b is supported.

5. Robustness tests

5.1. The independent variables lagged by one period

To solve the problem of omitted variables and other issues that may exist in our study, we follow Gu et al. (2018) by lagging the independent variables by one period, and substituting them into model (1) for regression. As shown in Table 5, the coefficients of the three proxies (L.SSH, L.SSF, and L.SSFH) are all significantly negative at the 0.01 level, which indicates that our research conclusions remain stable and consistent.

5.2. Heckman selection

As mentioned above, the Social Security Fund may mainly focus on blue chip stocks rather than choosing investment targets in a process of random selection. Therefore, we adopt the Heckman two-stage regression to alleviate the endogeneity problem of sample self-selection bias. In the first stage, we use a probit regression. The dependent variable is whether a listed company's stock is held by the Social Security Fund in a given year (SSH). We include all of the control variables in model (1). In the second stage, we run OLS regressions and include the inverse Mills ratio (Lambda), which is obtained from the first stage. Columns (2) and (3) of Table 6 reflect the results after controlling the Lambda. As shown in columns (2) and (3), the coefficients on the Social Security Fund (SSF and SSFH) are still significantly negative at the 0.01 level, thus proving that our conclusions are robust.

Table 4
The Social Security Fund holdings and auditor litigation risk.

	(1) Ln_Fee	(2) Ln_Fee	(3) Ln_Fee
SSH	-0.017** (-2.30)		
SSF		-0.027*** (-3.40)	
SSFH			-0.018*** (-3.25)
OI	-0.003*** (-4.65)	-0.003*** (-4.55)	-0.003*** (-4.60)
Cur	-0.017*** (-10.19)	-0.017*** (-10.19)	-0.017*** (-10.21)
Lev	-0.062** (-2.53)	-0.061** (-2.51)	-0.061** (-2.50)
Liq	0.094*** (3.55)	0.094*** (3.54)	0.094*** (3.56)
Rec	0.102*** (2.73)	0.103*** (2.76)	0.103*** (2.75)
Inv	-0.077** (-2.27)	-0.077** (-2.27)	-0.077** (-2.27)
Size	0.403*** (89.62)	0.403*** (89.35)	0.403*** (89.32)
MB	0.038*** (17.90)	0.038*** (17.93)	0.038*** (17.93)
ROA	-0.753*** (-8.25)	-0.744*** (-8.14)	-0.743*** (-8.13)
Big4	0.701*** (38.10)	0.700*** (38.10)	0.700*** (38.11)
Loss	0.014 (1.00)	0.015 (1.04)	0.015 (1.06)
Dual	0.007 (0.94)	0.007 (0.96)	0.007 (0.95)
Indexp	-0.004 (-0.07)	-0.006 (-0.11)	-0.005 (-0.09)
SOE	-0.141*** (-19.93)	-0.142*** (-20.07)	-0.141*** (-20.03)
Growth	0.005 (0.74)	0.005 (0.72)	0.005 (0.71)
CFO	0.172*** (3.78)	0.174*** (3.84)	0.174*** (3.83)
Abs_DA	-0.046 (-1.03)	-0.046 (-1.03)	-0.046 (-1.04)
Cons	4.540*** (45.72)	4.529*** (45.41)	4.528*** (45.36)
Year_Industry_FE	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes
N	17,830	17,830	17,830
R ² _a	0.659	0.659	0.659

All regressions are estimated by the ordinary least squares method. All regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year level. The superscripts ***, **, and * indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 5
The Social Security Fund holdings and auditor litigation risk: Lag effects.

	(1) Ln_Fee	(2) Ln_Fee	(3) Ln_Fee
L.SSH	−0.023 ^{***} (−2.71)		
L.SSF		−0.032 ^{***} (−3.56)	
L.SSFH			−0.022 ^{***} (−3.54)
OI	−0.003 ^{***} (−3.43)	−0.002 ^{***} (−3.35)	−0.003 ^{***} (−3.38)
Cur	−0.018 ^{***} (−8.60)	−0.018 ^{***} (−8.61)	−0.018 ^{***} (−8.63)
Lev	−0.075 ^{**} (−2.53)	−0.074 ^{**} (−2.52)	−0.074 ^{**} (−2.51)
Liq	0.122 ^{***} (3.86)	0.122 ^{***} (3.86)	0.124 ^{***} (3.90)
Rec	0.038 (0.85)	0.038 (0.86)	0.037 (0.84)
Inv	−0.083 ^{**} (−2.07)	−0.083 ^{**} (−2.06)	−0.084 ^{**} (−2.09)
Size	0.411 ^{***} (79.93)	0.411 ^{***} (79.68)	0.411 ^{***} (79.63)
MB	0.037 ^{***} (14.50)	0.037 ^{***} (14.51)	0.037 ^{***} (14.52)
ROA	−0.719 ^{***} (−6.61)	−0.709 ^{***} (−6.51)	−0.706 ^{***} (−6.48)
Big4	0.692 ^{***} (34.78)	0.691 ^{***} (34.77)	0.691 ^{***} (34.78)
Loss	0.018 (1.05)	0.018 (1.09)	0.019 (1.11)
Dual	0.008 (0.88)	0.008 (0.91)	0.008 (0.89)
Indexp	−0.025 (−0.39)	−0.028 (−0.44)	−0.027 (−0.42)
SOE	−0.143 ^{***} (−17.48)	−0.144 ^{***} (−17.61)	−0.143 ^{***} (−17.57)
Growth	0.005 (0.67)	0.005 (0.66)	0.005 (0.64)
CFO	0.144 ^{***} (2.60)	0.146 ^{***} (2.64)	0.146 ^{***} (2.64)
Abs_DA	−0.034 (−0.62)	−0.033 (−0.61)	−0.032 (−0.60)
Cons	4.435 ^{***} (39.14)	4.426 ^{***} (38.92)	4.424 ^{***} (38.87)
Year_Industry_FE	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes
N	13,334	13,334	13,334
R ² _a	0.659	0.660	0.660

All regressions are estimated by the ordinary least squares method. All regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year level. The superscripts ^{***}, ^{**}, and ^{*} indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 6
Heckman two-stage regression.

	First stage		Second stage	
	(1)	(2)	(2)	(3)
	SSH	Ln_Fee	Ln_Fee	Ln_Fee
SSFH		−0.020 ^{***} (−3.51)		
SSF				−0.030 ^{***} (−3.88)
OI	0.012 ^{***} (5.78)	−0.006 ^{***} (−7.15)		−0.006 ^{***} (−7.20)
Cur	−0.009 (−1.29)	−0.015 ^{***} (−8.72)		−0.015 ^{***} (−8.83)
Lev	−0.396 ^{***} (−4.44)	0.025 (0.91)		0.024 (0.85)
Liq	0.462 ^{***} (5.00)	−0.025 (−0.79)		−0.025 (−0.78)
Rec	0.129 (0.97)	0.074 [*] (1.93)		0.075 ^{**} (1.99)
Inv	−0.390 ^{***} (−3.12)	0.022 (0.58)		0.022 (0.56)
Size	0.209 ^{***} (15.88)	0.352 ^{***} (37.61)		0.352 ^{***} (36.03)
MB	0.014 [*] (1.74)	0.033 ^{***} (14.74)		0.033 ^{***} (14.30)
ROA	3.028 ^{***} (9.06)	−1.431 ^{***} (−9.32)		−1.426 ^{***} (−9.75)
Big4	0.033 (0.74)	0.686 ^{***} (37.25)		0.686 ^{***} (36.16)
Loss	−0.020 (−0.36)	0.004 (0.25)		0.003 (0.24)
Dual	0.025 (0.93)	0.001 (0.08)		0.001 (0.11)
Indexp	−0.405 ^{**} (−2.06)	0.085 (1.42)		0.083 (1.37)
SOE	0.134 ^{***} (5.31)	−0.173 ^{***} (−20.86)		−0.173 ^{***} (−19.77)
Growth	−0.010 (−0.46)	0.008 (1.21)		0.008 (1.24)
CFO	0.514 ^{***} (2.97)	0.034 (0.67)		0.035 (0.66)
Abs_DA	−0.077 (−0.48)	−0.049 (−1.18)		−0.048 (−1.05)
Lambda		−1.458 ^{***} (−5.69)		−1.444 ^{***} (−5.66)
Cons	−5.719 ^{***} (−18.97)	6.694 ^{***} (17.94)		6.675 ^{***} (17.54)
Industry_Year_FE	Yes	Yes	Yes	Yes
N	17,806	17,806		17,806
R ² _a		0.660		0.660

All regressions include the industry and year fixed effects. The superscripts ^{***}, ^{**}, and ^{*} indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively. In the first stage, there are 24 observations not used.

5.3. Propensity score-based matching

We further confirm that our inferences are robust by using the PSM (propensity score-based matching) method as suggested by [Armstrong et al. \(2010\)](#). These researchers argue that using a propensity score design

that achieves maximum variation in the variable of interest, while minimizing variation in the control variables, is a superior econometric approach to matching on an outcome variable. Specifically, the size of the enterprise (Size), asset-liability ratio (Lev), operating cash flow (CFO), return on total assets (ROA), audit

Table 7
Propensity-score matching regression.

	(1) Ln_Fee	(2) Ln_Fee	(3) Ln_Fee
SSH	-0.018* (-1.92)		
SSF		-0.028*** (-3.05)	
SSFH			-0.019*** (-3.11)
OI	-0.004*** (-3.93)	-0.004*** (-3.78)	-0.004*** (-3.83)
Cur	-0.020*** (-7.88)	-0.020*** (-7.87)	-0.020*** (-7.90)
Lev	-0.104** (-2.53)	-0.101** (-2.48)	-0.102** (-2.49)
Liq	0.170*** (4.19)	0.169*** (4.18)	0.171*** (4.21)
Rec	-0.077 (-1.37)	-0.075 (-1.34)	-0.076 (-1.35)
Inv	-0.057 (-1.04)	-0.056 (-1.02)	-0.057 (-1.04)
Size	0.424*** (65.65)	0.424*** (65.66)	0.424*** (65.61)
MB	0.031*** (9.38)	0.031*** (9.39)	0.031*** (9.40)
ROA	-0.828*** (-5.86)	-0.820*** (-5.81)	-0.809*** (-5.73)
Big4	0.681*** (29.47)	0.681*** (29.45)	0.681*** (29.46)
Loss	-0.000 (-0.00)	0.000 (0.01)	0.001 (0.03)
Dual	0.005 (0.42)	0.005 (0.46)	0.005 (0.44)
Indexp	-0.053 (-0.63)	-0.057 (-0.68)	-0.055 (-0.65)
SOE	-0.154*** (-14.49)	-0.157*** (-14.66)	-0.156*** (-14.61)
Growth	0.020* (1.95)	0.020* (1.92)	0.020* (1.90)
CFO	0.196*** (2.67)	0.200*** (2.72)	0.200*** (2.72)
Abs_DA	-0.127* (-1.76)	-0.127* (-1.76)	-0.129* (-1.78)
Cons	4.072*** (28.13)	4.065*** (28.12)	4.054*** (27.98)
Industry_Year_FE	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes
N	8672	8672	8672
R ² _a	0.692	0.692	0.693

All regressions are estimated by the ordinary least squares method. All of the regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year levels. The superscripts ***, **, and * indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

opinions (Opinion), Big Four accounting firms (Big4), state-owned enterprises (SOE), earnings below zero (Loss), market-to-book ratio (MB), earnings quality (Abs_DA), and year and industry fixed effects are all included as our propensity score matching factors. Following [Armstrong et al. \(2010\)](#), we first estimate a

Table 8
Replacing Big4 with Big10.

	(1) Ln_Fee	(2) Ln_Fee	(3) Ln_Fee
SSH	-0.016* (-1.92)		
SSF		-0.029*** (-3.41)	
SSFH			-0.019*** (-3.23)
OI	-0.004*** (-6.43)	-0.004*** (-6.33)	-0.004*** (-6.37)
Cur	-0.018*** (-10.35)	-0.018*** (-10.36)	-0.018*** (-10.37)
Lev	-0.134*** (-5.15)	-0.133*** (-5.14)	-0.133*** (-5.14)
Liq	0.045 (1.64)	0.045* (1.65)	0.046* (1.67)
Rec	0.166*** (4.29)	0.168*** (4.32)	0.167*** (4.31)
Inv	-0.078** (-2.23)	-0.079** (-2.23)	-0.079** (-2.24)
Size	0.458*** (96.58)	0.459*** (96.27)	0.459*** (96.20)
MB	0.047*** (21.13)	0.048*** (21.16)	0.048*** (21.15)
ROA	-0.855*** (-8.82)	-0.842*** (-8.69)	-0.841*** (-8.67)
Big10	0.150*** (23.12)	0.150*** (23.11)	0.150*** (23.11)
Loss	0.010 (0.68)	0.011 (0.72)	0.011 (0.74)
Dual	0.002 (0.32)	0.003 (0.35)	0.003 (0.33)
Indexp	0.086 (1.36)	0.083 (1.32)	0.085 (1.34)
SOE	-0.144*** (-19.60)	-0.145*** (-19.72)	-0.144*** (-19.69)
Growth	-0.004 (-0.64)	-0.004 (-0.66)	-0.005 (-0.68)
CFO	0.270*** (5.66)	0.273*** (5.73)	0.272*** (5.73)
Abs_DA	-0.032 (-0.68)	-0.032 (-0.68)	-0.032 (-0.69)
Cons	3.346*** (31.65)	3.330*** (31.35)	3.330*** (31.30)
Industry_Year_FE	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes
N	17,830	17,830	17,830
R ² _a	0.617	0.618	0.617

All regressions are estimated by the ordinary least squares method. All of the regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year levels. The superscripts ***, **, and * indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

propensity score model for the probability that the Social Security Fund holds shares of a public company, conditional on observable features of the contracting environment. Second, we identify the matched pairs with the smallest propensity score differences, and examine the covariate balance between the treatment and the control samples. The number of matched samples is 8672. Finally, we examine the relationship between the

Table 9
The path analysis on the effects of Social Security Fund investment on auditor litigation risk.

	(1) Effort	(2) Effort	(3) Effort
SSH	−0.009** (−2.01)		
SSF		−0.012*** (−2.64)	
SSFH			−0.008*** (−2.76)
OI	−0.001** (−2.56)	−0.001** (−2.49)	−0.001** (−2.52)
Cur	−0.002 (−1.49)	−0.002 (−1.49)	−0.002 (−1.50)
Lev	−0.056*** (−3.36)	−0.056*** (−3.34)	−0.056*** (−3.34)
Liq	0.054*** (3.14)	0.054*** (3.14)	0.054*** (3.15)
Rec	0.031 (1.28)	0.031 (1.29)	0.031 (1.29)
Inv	−0.047** (−2.08)	−0.047** (−2.07)	−0.047** (−2.08)
Size	0.021*** (8.76)	0.021*** (8.84)	0.021*** (8.84)
MB	−0.004** (−2.56)	−0.004** (−2.55)	−0.004** (−2.54)
ROA	−0.467*** (−7.51)	−0.463*** (−7.44)	−0.462*** (−7.42)
Big4	−0.038*** (−5.81)	−0.038*** (−5.85)	−0.038*** (−5.84)
Loss	0.039*** (4.55)	0.039*** (4.57)	0.039*** (4.58)
Dual	0.012** (2.56)	0.012*** (2.58)	0.012** (2.57)
Indexp	0.024 (0.70)	0.023 (0.68)	0.024 (0.69)
SOE	−0.029*** (−6.44)	−0.030*** (−6.53)	−0.030*** (−6.50)
Growth	−0.016*** (−3.60)	−0.016*** (−3.60)	−0.017*** (−3.62)
CFO	−0.126*** (−3.96)	−0.125*** (−3.93)	−0.125*** (−3.93)
Abs_DA	0.000 (0.01)	0.000 (0.01)	0.000 (0.00)
Cons	4.067*** (76.47)	4.063*** (76.40)	4.062*** (76.26)
Industry_Year_FE	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes
N	17,830	17,830	17,830
R ² _a	0.080	0.080	0.080

Panel B Path 2: Business risk

	(1) Operate_Factor	(2) Operate_Factor	(3) Operate_Factor	(4) Solvency_Factor	(5) Solvency_Factor	(6) Solvency_Factor
SSH	0.008*** (3.01)			0.023*** (6.01)		
SSF		0.010*** (3.68)			0.025*** (6.31)	
SSFH			0.006*** (3.83)			0.016*** (6.71)
OI	-0.001** (-2.38)	-0.001** (-2.44)	-0.001** (-2.39)	-0.000 (-0.07)	-0.000 (-0.14)	-0.000 (-0.08)
Cur	-0.515*** (-706.48)	-0.515*** (-706.67)	-0.515*** (-706.24)	0.442*** (300.74)	0.442*** (300.99)	0.442*** (300.91)
Lev	0.212*** (19.88)	0.212*** (19.89)	0.212*** (19.87)	-1.045*** (-49.41)	-1.046*** (-49.46)	-1.046*** (-49.43)
Liq	-0.014 (-0.95)	-0.013 (-0.94)	-0.014 (-0.96)	-0.036* (-1.83)	-0.035* (-1.79)	-0.036* (-1.85)
Rec	-0.088*** (-4.21)	-0.088*** (-4.22)	-0.087*** (-4.19)	0.022 (0.80)	0.021 (0.79)	0.022 (0.82)
Inv	-0.045** (-2.26)	-0.045** (-2.27)	-0.045** (-2.26)	0.062** (2.21)	0.061** (2.18)	0.061** (2.21)
Size	0.011*** (7.03)	0.011*** (7.01)	0.011*** (7.04)	0.023*** (9.34)	0.023*** (9.34)	0.023*** (9.32)
MB	0.001 (0.99)	0.001 (0.97)	0.001 (0.98)	0.000 (0.08)	0.000 (0.07)	0.000 (0.07)
ROA	1.515*** (35.36)	1.512*** (35.15)	1.513*** (35.25)	2.271*** (33.48)	2.267*** (33.33)	2.267*** (33.38)
Big4	0.034*** (3.86)	0.034*** (3.89)	0.034*** (3.89)	0.024*** (2.95)	0.024*** (3.01)	0.024*** (3.01)
Indexp	-0.023 (-0.96)	-0.022 (-0.92)	-0.023 (-0.95)	-0.053 (-1.52)	-0.050 (-1.46)	-0.052 (-1.51)
Dual	0.001 (0.37)	0.001 (0.35)	0.001 (0.36)	0.001 (0.25)	0.001 (0.22)	0.001 (0.25)
Loss	-0.081*** (-14.39)	-0.081*** (-14.40)	-0.081*** (-14.40)	-0.462*** (-38.76)	-0.462*** (-38.78)	-0.462*** (-38.81)
SOE	0.004* (1.67)	0.004* (1.76)	0.004* (1.72)	0.000 (0.05)	0.001 (0.21)	0.001 (0.15)
Growth	0.049*** (4.42)	0.049*** (4.42)	0.049*** (4.43)	0.051*** (6.95)	0.051*** (6.96)	0.051*** (6.97)
Cons	-0.183*** (-5.64)	-0.181*** (-5.62)	-0.182*** (-5.62)	-0.512*** (-9.35)	-0.512*** (-9.36)	-0.510*** (-9.31)
Industry_Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	11,899	11,899	11,899	11,899	11,899	11,899
R ² _a	0.985	0.985	0.985	0.965	0.965	0.965

All regressions are estimated by the ordinary least squares method. All of the regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year levels. The superscripts ***, **, and * indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Social Security Fund and the auditor litigation risk by assessing whether the audit fees differ significantly between the treatment and the control groups.

On the basis of the PSM-matched samples, regressions are performed on model (1). The results are shown in Table 7. These empirical results show that the coefficients on the Social Security Fund (SSH, SSF, and SSFH) are all significantly negative, at least at the 0.1 level, and our conclusions remain unchanged.

Table 10
Regulating effects of governance levels in the listed companies.

	Low level of corporate governance			High level of corporate governance		
	(1) Ln_Fee	(2) Ln_Fee	(3) Ln_Fee	(4) Ln_Fee	(5) Ln_Fee	(6) Ln_Fee
SSH	-0.034*** (-3.00)			0.005 (0.47)		
SSF		-0.047*** (-3.92)			-0.004 (-0.41)	
SSFH			-0.025*** (-3.04)			-0.010 (-1.32)
OI	-0.003*** (-3.25)	-0.003*** (-3.14)	-0.003*** (-3.18)	-0.003*** (-3.28)	-0.003*** (-3.23)	-0.003*** (-3.21)
Cur	-0.020*** (-6.21)	-0.021*** (-6.26)	-0.021*** (-6.28)	-0.015*** (-8.06)	-0.015*** (-8.08)	-0.015*** (-8.10)
Lev	-0.051 (-1.28)	-0.049 (-1.24)	-0.048 (-1.22)	-0.070** (-2.26)	-0.071** (-2.28)	-0.071** (-2.29)
Liq	0.128*** (2.96)	0.128*** (2.94)	0.128*** (2.95)	0.065** (1.96)	0.066** (1.99)	0.067** (2.02)
Rec	-0.002 (-0.03)	-0.001 (-0.01)	-0.002 (-0.04)	0.215*** (4.63)	0.215*** (4.63)	0.215*** (4.64)
Inv	-0.075 (-1.37)	-0.073 (-1.34)	-0.075 (-1.36)	-0.047 (-1.12)	-0.049 (-1.15)	-0.049 (-1.17)
Size	0.424*** (65.07)	0.425*** (64.90)	0.425*** (64.78)	0.377*** (58.92)	0.377*** (58.72)	0.378*** (58.78)
MB	0.043*** (11.69)	0.043*** (11.72)	0.043*** (11.71)	0.033*** (12.53)	0.033*** (12.55)	0.033*** (12.57)
ROA	-0.753*** (-5.20)	-0.739*** (-5.11)	-0.745*** (-5.13)	-0.678*** (-5.86)	-0.670*** (-5.79)	-0.660*** (-5.71)
Big4	0.694*** (30.82)	0.693*** (30.83)	0.693*** (30.80)	0.697*** (21.10)	0.697*** (21.10)	0.697*** (21.13)
Loss	0.002 (0.07)	0.002 (0.11)	0.002 (0.12)	0.034* (1.81)	0.035* (1.82)	0.035* (1.84)
SOE	-0.151*** (-13.07)	-0.152*** (-13.24)	-0.152*** (-13.21)	-0.151*** (-11.97)	-0.151*** (-11.96)	-0.151*** (-11.95)
Indexp	0.115 (0.90)	0.104 (0.81)	0.104 (0.82)	-0.027 (-0.40)	-0.028 (-0.42)	-0.028 (-0.42)
Growth	-0.008 (-0.70)	-0.008 (-0.71)	-0.008 (-0.72)	0.012 (1.53)	0.012 (1.53)	0.012 (1.51)
CFO	0.142** (2.02)	0.147** (2.08)	0.143** (2.03)	0.195*** (3.32)	0.196*** (3.34)	0.198*** (3.37)
Dual	0.047* (1.81)	0.047* (1.80)	0.047* (1.82)	-0.006 (-0.73)	-0.006 (-0.71)	-0.006 (-0.70)
Abs_DA	-0.038 (-0.55)	-0.037 (-0.53)	-0.039 (-0.56)	-0.028 (-0.49)	-0.028 (-0.50)	-0.029 (-0.51)
Cons	4.143*** (28.96)	4.128*** (28.75)	4.138*** (28.80)	5.025*** (35.60)	5.013*** (35.33)	4.999*** (35.18)
Industry_Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm_Year_Cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	8594	8594	8594	9236	9236	9236
R ² _a	0.680	0.680	0.680	0.618	0.618	0.619

All regressions are estimated by the ordinary least squares method. All of the regressions include the industry and year fixed effects. The standard errors are clustered at the stock and year levels. The superscripts ***, **, and * indicate two-tailed statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

5.4. Replacing Big4 with Big10

In China, the top 10 accounting firms have high audit quality (Guan et al., 2016), and they charge a fee premium. Following Cai et al. (2019), we replace the top four international accounting firms (Big4) with

the top 10 domestic accounting firms (Big10) to mitigate the problem of potential missing variables. The empirical results are shown in Table 8. The coefficients on Big10 are all significantly positive, and we continue to find that the regression coefficients on the Social Security Fund holdings (SSH, SSF, and SSFH) are still significantly negative, at least at the 0.1 level. These findings support the robustness of this study's conclusions.

6. Further analysis

To analyze the effect path of Social Security Fund holdings on auditor litigation risk, we explore the following two questions. First, what is the effect path of Social Security Fund holdings on reductions of auditor litigation risk? Second, does the impact of Social Security Fund holdings on auditor perceptions of litigation risk vary under differing levels of corporate governance?

6.1. The path of Social Security Fund influence on auditor litigation risk

How does the Social Security Fund affect auditor perceptions of litigation risk? What is the path of that effect? As mentioned earlier, the engagement risks faced by auditors mainly come from audit risk and clients' business risk (Johnstone, 2000; Stanley, 2011; Zhai et al., 2017; Cassell et al., 2018). Auditors adjust their audit plans and audit investments based on their clients' levels of audit risk (Johnstone, 2000; DeFond and Zhang, 2014). Therefore, we use audit input to measure audit risk. Following previous studies (Jha and Chen, 2014; Reid et al., 2019), we consider that the audit input (Effort) is equal to the time interval (in days) between the fiscal year-end and the audit report date. We examine the relation between the Social Security Fund holdings and the audit risk using the following model:

$$\begin{aligned} \text{Audit_Risk} = & \beta_0 + \beta_1 \text{SSH} + \beta_2 \text{OI} + \beta_3 \text{Cur} + \beta_4 \text{Lev} + \beta_5 \text{Liq} + \beta_6 \text{Rev} + \beta_7 \text{Inv} + \beta_8 \text{Size} + \beta_9 \text{MB} \\ & + \beta_{10} \text{ROA} + \beta_{11} \text{Big4} + \beta_{12} \text{Loss} + \beta_{13} \text{Dual} + \beta_{14} \text{Indexp} + \beta_{15} \text{SOE} + \beta_{16} \text{Growth} \\ & + \beta_{17} \text{CFO} + \beta_{18} \text{Abs_DA} + \text{Year} + \text{Industry} + \varepsilon \end{aligned} \quad (2)$$

Panel A of Table 9 reports the results regarding the impact of Social Security Fund holdings on the auditors' audit risk. The dependent variable is auditor input (Effort), and the independent variables are Social Security Fund proxies (SSH, SSF, and SSFH). As shown in the regression results, the coefficients of these Social Security Fund proxies are significantly negative, at least at the 0.05 level, which indicates that the Social Security Fund significantly reduces the auditors' audit risk.

In addition, investments by the Social Security Fund may decrease auditor litigation risk through reducing a company's business risk. Although previous research (Zhai et al., 2017) uses four variables to separately measure the operating risk of an enterprise (such as capital structure (Lev), total return on assets (ROA), loss (Loss), and operating cash flow (CFO)), no one of these variables alone can measure the business risk of an enterprise. Therefore, following Stanley (2011),⁴ we use principal component analysis to construct an index of operating risks by selecting five variables, namely operating returns (ROAEarnings), operating cash flows (CAshearnings), capital structure (Lev), current ratio (Cur), and interest solvency (InvInterestCov). As is consistent with the approach used by Stanley (2011), the first and second principal components are operating performance (Operate_Factor) and solvency (Solvency_Factor), and our model (3) is established as follows:

$$\begin{aligned} \text{Bus_Risk} = & \beta_0 + \beta_1 \text{SSH} + \beta_2 \text{OI} + \beta_3 \text{Cur} + \beta_4 \text{Lev} + \beta_5 \text{Liq} + \beta_6 \text{Rec} + \beta_7 \text{Inv} + \beta_8 \text{Size} + \beta_9 \text{MB} \\ & + \beta_{10} \text{ROA} + \beta_{11} \text{Big4} + \beta_{12} \text{Indexp} + \beta_{13} \text{Dual} + \beta_{14} \text{Loss} + \beta_{15} \text{SOE} + \beta_{16} \text{Growth} + \text{Year} \\ & + \text{Industry} + \varepsilon \end{aligned} \quad (3)$$

⁴ ROAEarnings = earnings, measured as operating income after depreciation divided by total assets at the beginning of the period; ROACash = operating cash flows divided by total assets at the beginning of the period; CurrentRatio = current ratio, measured as current assets divided by current liabilities; Leverage = leverage, measured as total liabilities divided by total assets; and InvInterestCov = inverse interest coverage, measured as interest expense divided by operating income before depreciation. Following Efendi et al. (2007), the ratio is capped at 2.00 and assigned a value of 2.00, if the operating income before depreciation is negative.

In model (3), the dependent variable, *Bus_Risk*, is replaced first by *Operate_Factor*, and then by *Solvency_Factor*. The independent variables are *SSH*, *SSF*, and *SSFH*. Panel B of Table 9 shows the impact of Social Security Fund holdings on business risk. As the variables of *Operate_Factor* and *Solvency_Factor* are both inverse indicators, we expect that the coefficients of *SSH*, *SSF*, and *SSFH* will be significantly positive. The regression results show that the regression coefficients on *Operate_Factor* and *Solvency_Factor* are all significantly positive at the 0.01 level, which indicates that the Social Security Fund holdings can significantly reduce an enterprise's business risk. On the basis of the regression results shown in Table 9, we can conclude that the Social Security Fund lowers an auditor's litigation risk by reducing both the audit risk and the business risk.

6.2. Regulatory effect of the level of corporate governance

Companies with lower governance quality provide the environments and the opportunities for management fraud, which results in high auditor litigation risk (Pratt and Stice, 1994). Companies with higher governance quality effectively monitor and restrain their managers' self-interested behavior. As an independent long-term institution, the Social Security Fund specializes in monitoring rather than trading, and it plays an important role in external governance, thereby curbing the managers' short-sighted behavior. Therefore, we expect that the governance role of the Social Security Fund will be more pronounced in the group of companies with lower levels of corporate governance. If the impact of Social Security Fund holdings on auditor litigation risk is found to vary in a theoretically predictable manner, this finding would provide greater confidence in our conclusions. Such a finding would also shed empirical light on the mechanisms through which the Social Security Fund takes a monitoring role in public companies, and it would reduce concerns about reverse causality.

To test our expectation, we divide our sample into two groups by corporate governance level and empirically test whether these groups show different results. We draw on the method applied by Li et al. (2018) and construct a listed company's governance index through principal component analysis. The specific indicators selected are (1) the shareholding ratio of the largest shareholder (*FirstH*), (2) the sum of squares held by the second to the tenth largest shareholders (*Cstr2_10*), (3) the proportion of independent directors on the board (*Indexp*), (4) whether the chairman and CEO are the same person (*Dual*), (5) the size of the board of directors (*Numboard*), (6) the proportion of senior executives who hold shares (*M_share*), (7) whether the company is listed overseas, or if it issues B shares (*H/B*), and (8) whether the company is state-controlled (*SOE*). We select the first principal component to measure the governance of the listed companies.

The results are shown in Table 10. The coefficients on the Social Security Fund variables (*SSH*, *SSF*, and *SSFH*) are all significantly negative at the 0.01 level in the group with low corporate governance, but they are not significant in the group with high levels of corporate governance. These results show that the Social Security Fund, as a high-quality, long-term investor, plays an active role in external governance, thereby reducing the litigation risk faced by auditors.

7. Conclusions and implications

As an important institutional investor in China's capital market, the Social Security Fund has attracted increasing attention from scholars and regulators in recent years. However, studies on the governance role played by the Social Security Fund have produced inconsistent conclusions. Unlike previous studies, we examine the governance role of the Social Security Fund from the perspective of auditors. We find that the Social Security Fund significantly reduces the litigation risk faced by auditors, and the main paths to this outcome come through reducing the auditor's audit risk and the enterprise's business risk. Furthermore, we find that the negative correlation between the Social Security Fund and auditor litigation risk is more significant for companies with low levels of corporate governance. Taking these findings together, we verify that the Social Security Fund, as an independent long-term institutional investor, plays an important role in external governance, and that investments by this fund tend to reduce auditor litigation risk.

On the basis of our findings, we offer the following recommendations for reference by policy makers. (1) The Social Security Fund should further enter the capital market as a way to strengthen the team of high-quality institutional investors. The involvement of this fund can steadily improve the investment environment

of China's A-share market, gradually transforming it from a transaction-oriented to a configuration-based market that has long-term value. (2) The Social Security Fund should be encouraged to actively participate in the governance of companies and to play a role in promoting the high-quality management of listed companies. In 2009, the State Council issued its "Implementation Measures for the Transfer of Partial State-owned Shares in the Domestic Securities Market to Enrich the National Social Security Fund." This document states that the Social Security Fund has the right to gain and dispose of transferred shares but should avoid interfering with the daily management of listed companies. Our findings indicate that such restrictions should be lifted, and the Social Security Fund should be encouraged to play an active role in external governance.

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