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Corporate governance and audit fees: Evidence from companies listed on the Shanghai Stock Exchange

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ABSTRACT

This study uses data from companies listed on the Shanghai Stock Exchange to investigate the relationship between corporate governance and audit fees. Full sample results reveal a significant negative relationship between corporate governance and audit fees, and subsample results further show that corporate governance's influence on audit fees is affected by corporate growth. The negative relationship between corporate governance and audit fees is economically and statistically significant in sample companies that grew moderately during the sample period, and mixed or insignificant in companies that experienced overly fast or negative growth.

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1. Introduction

China's special audit market has important theoretical and empirical implications for the determinants of audit fees (Zhu and Yu, 2004). Of the various determinants thus far proposed in the literature, corporate governance constitutes a relatively new research topic (Larcker and Richardson, 2004; Cai, 2007). Since the demise of Enron and WorldCom, however, the internal corporate governance of listed companies has become

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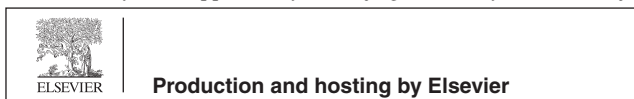
a topic of considerable research interest (Liu and Hu, 2006). Auditors themselves have also begun to attach greater importance to evaluations of internal corporate governance. On 15 February 2006, China's Ministry of Finance announced the issuance of new auditing standards. These standards implement a risk-oriented audit approach that attaches importance to the risks associated with a firm's governance structure. Auditing Standard No. 1211 states clearly that auditors must pay attention to the governance structure of the audited entity. However, it remains unclear whether corporate governance has any effect on audit fees and, if it does have such an effect, how it influences audit fees.

There are at least two arguments concerning the relationship between corporate governance and audit fees. The first is informed by substitution theory and the second by signaling theory, and the two lead to different conclusions. Substitution theory posits that the more perfect the internal corporate governance structure of a firm, and hence the lower the agency costs, the fewer risks the audit firm and auditor will encounter and thus the lower the audit fee that will be charged. In other words, an audit is seen as a form of external governance for which effective internal corporate governance may substitute to some degree. Signaling theory argues that managers signal high-level corporate governance to external stakeholders[1] by inviting a more rigorous external audit, which inevitably leads to higher audit fees, i.e., companies with strong corporate governance pay higher audit fees to accounting firms. The mixed empirical evidence reported to date leaves unanswered the question of which theory better explains corporate practice.

Most of the literature on the relationship between corporate governance and audit fees concentrates on one or more aspects of corporate governance, such as ownership, board of director or management characteristics, as proxy variables for corporate governance (Pan, 2008). Although the use of such proxies renders it easy to collect and treat data, it has a number of disadvantages. For example, it introduces the possibility of omitted variables in the models because all corporate governance characteristics are not included. In addition, different characteristics may interact with one another in a manner too complex to identify, thus producing possibly biased results. Finally, as the influence of single characteristics on the level of corporate governance is uncertain, it is doubtful whether a proper corporate governance proxy exists. For example, some scholars believe that CEO duality impairs corporate governance, whereas others take the opposite view. It is thus clear that identifying the relationship between audit fees and corporate governance on the basis of such a proxy is problematic, although a more comprehensive corporate governance variable would mitigate or eliminate such problems to a considerable extent.

The Shanghai Stock Exchange (SSE) introduced the SSE Corporate Governance Sector in 2007, thus offering a good opportunity for a comprehensive investigation of the relationship between corporate governance and audit fees. The listed companies within this sector are subject to greater public scrutiny of their corporate governance structures. After preliminary examination of listed companies' application qualifications, the appraisal working group of the Corporate Governance Sector publishes the application materials of those that qualify on its official website for public appraisal. The overall aim is to involve public investors in the appraisal process and encourage all market participants to pay greater attention to the issue of corporate governance. The SSE also invites professional research institutions to appraise the SSE Corporate Governance Sector and to judge the governance structures of the companies submitting applications. These research institutions include CITIC Securities Co., Ltd., Guotai Junan Securities Co., Ltd., Shenyin & Wanguo Securities Co., Ltd. and Haitong Securities Co., Ltd., among others. Experts and scholars have also been invited to form an Expert Consultative Committee for Appraisal of the Corporate Governance Sector, which meets regularly to discuss the method, process and results of the appraisal process, thus ensuring its objectivity and standardization. This rigorous appraisal process ensures that listed companies undergo comprehensive assessment of their corporate governance level prior to inclusion in the SSE Corporate Governance Sector. As noted, it also makes possible a comprehensive investigation of the relationship between corporate governance and audit fees.

This study uses inclusion in the SSE Corporate Governance Sector as a proxy for corporate governance to empirically investigate the relationship between corporate governance and audit fees after controlling for the

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[1] It is obvious that companies will not pay higher audit fees to convey a signal to the market merely for signaling purposes. Rather, such motives as obtaining financing from the market, boosting firm value or reducing financing costs generally explain signaling behavior.

other main factors associated with audit fees. Compared to the proxies used in most of the recent literature, the proxy used here is more comprehensive, authoritative and easily understood, and it is also easily collected. If a relationship between corporate governance and audit fees is confirmed, listed firms may use such confirmation in the future to negotiate audit fees with accounting firms, which is one of the main innovations and contributions of this study.

The focus on risk under the risk-oriented audit approach is likely to lead to interactions between corporate growth and internal governance in listed companies. Companies experiencing overly fast or negative growth are characterized by greater risk (Lang et al., 1996) and their internal corporate governance may suffer an adverse change in stability, thus providing management with the motivation to manage reported earnings. Companies that grow steadily and moderately, in contrast, are often in the maturity stage.[2] They thus experience a lower degree of risk and their internal corporate governance is relatively stable. Cui et al. (2007) examine the relationship between corporate growth and financial risk and find the probability that a company experiences financial crisis increases dramatically when its growth rate exceeds what the authors call a reasonable growth rate. They also report a significant positive relationship between the probability of financial crisis and excessive growth rates and an insignificant relationship between the probability of financial crisis and the real growth rate of non-excessively growing companies (Cui et al., 2007). In reality, many companies appear to collapse suddenly. Enron and WorldCom in the United States and the Giant Group and Qinchi Alcohol in China are representative examples. In line with the foregoing discussion, this study examines subsamples grouped by corporate growth in addition to the full sample. The full sample reveals a significant negative relationship between corporate governance and audit fees, and the subsample results also show that corporate governance's influence on audit fees is affected by corporate growth. The negative relationship between corporate governance and audit fees is economically and statistically significant in sample companies that grew moderately during the sample period, whereas the relationship is mixed or insignificant for companies that experienced overly fast or negative growth.

The remainder of this paper is organized as follows. Section 2 reviews the literature on audit fees and corporate governance. Section 3 develops the research hypotheses, which are grounded in theoretical analysis. Section 4 describes the data and variables. The full sample and subsample regression results are provided in Sections 5 and 6, respectively. Section 7 reports the result of a sensitivity test and Section 8 concludes the paper.

2. Overview of prior research

2.1. Factors associated with audit fees

Audit fees have been a subject of interest in the auditing literature since the pioneering research of Simunic (1980). Simunic (1980) posits that audit fees are determined by the loss exposure of the auditee, the apportionment rate of loss between the audit firm and the auditee, and the production function and characteristics of the audit firm. He provides empirical evidence to show that the scale of the auditee is the main factor influencing audit fees, although the number of consolidated subsidiaries included in the auditee's financial statements, number of industries in which the auditee operates, ratio of the auditee's assets abroad to total assets at year-end, ratio of receivables to total assets at year-end, ratio of inventory to total assets at year-end and whether an auditee incurred a loss in the most recent 3 years or received a "subject to" qualified opinion also have a significant influence. Simunic finds the ratio of net income to total assets at year-end, auditor tenure and audit firm scale to have no significant influence on audit fees. Francis (1984) investigates the Australian audit market using a modified Simunic model and also finds the scale of listed companies' assets and a variable reflecting the complexity of business transactions or events (the number of consolidated subsidiaries) to be significantly related to audit fees. However, contrary to Simunic (1980), Francis also finds the scale of the audit firm to be significantly related to audit fees. Francis and Stokes (1986) investigate the 96 largest and 96 small-

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[2] The typical lifecycle of an enterprise comprises four stages, i.e., start-up, growth, maturity and decline. Although a low rate of growth is a common characteristic of the start-up and maturity stages, this study considers it to be associated with the maturity stage alone, as Chinese legal regulations prohibit firms in the start-up stage from listing on the A-share market.

est publicly traded non-finance companies in the Australian Graduate School of Management Annual Report Data Files and find that Big 8 price premiums are observed for small auditees but not for large auditees. Gul (2001) takes the opinion that audit fees can be considered simply as a function of firm size, complexity and audit risk.

In December 2001, the China Securities Regulatory Commission promulgated "Standards Concerning the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No. 2-Contents and Formats of Annual Reports (Revised in 2001)" and "Question and Answer Document Concerning the Standards of Information Disclosure by Companies Offering Securities to the Public No. 6-Payments to Accounting Firms and Disclosure." These documents state that listed companies are required to disclose their audit fees in their annual reports from 2001 onwards. The new regulations prompted a number of Chinese scholars to carry out empirical studies of audit fees using data from Chinese listed companies. Most of these studies adopt the model developed by Simunic (1980) and use financial variables (Liu and Hu, 2006). Wang (2002) was one of the first in China to investigate audit fees empirically. He reports the scale of the auditee and audit firm, audit complexity and audit risk, the industry in which the auditee operates and whether the auditee receives a qualified opinion to have an effect on audit fees. Wu (2003) cites auditee scale, whether an auditee has been audited by one of the Big 5, audit opinion, ratio of accounts receivable to total assets and the ratio of inventory to total assets as the main factors influencing audit fees. Han and Zhou (2003) find the auditee's total assets, audit opinion, number of consolidated subsidiaries and debt ratio to be significantly related to audit fees. Liu et al. (2003) analyze 590 companies and conclude that the scale and location of a listed company and the complexity of its business transactions are the main factors influencing audit fees, whereas there are no significant relationships with the ratio of inventory to total assets, ratio of long-term debt to total assets, loss occurrence, audit tenure and audit firm scale. Zhu and Guo (2006) investigate the issues surrounding audit fee increases in companies with no changes in accounting firms and find company expansion and an increase in the debt ratio to be the two main explanatory factors. In addition, they also find a change in the ratio of cash to current debt, intention to opinion shop and earnings management to be significantly related to an audit fee increase, although a change in return on equity (ROE) and changes in the ratios of accounts receivable and inventory to total assets exhibit no relationship. Most of the empirical studies to date find auditee scale and complexity and whether a firm has been audited by one of the "Big N" firms to have a significantly positive influence on audit fees (Simunic, 1980[3]; Francis and Stokes, 1986; Gul, 2001; Wu, 2003; Han and Zhou, 2003; Liu and Hu, 2006). With regard to the ratios of inventory to total assets and accounts receivable to total assets, domestic and overseas findings differ, with studies carried out overseas usually reporting a positive relationship between these ratios and audit fees (e.g., Simunic, 1980) and domestic studies finding no such relationship.

2.2. Corporate governance and audit fees

Although many studies have examined the factors influencing audit fees, the relationship between corporate governance and audit fees is only now beginning to receive extensive research attention. The preliminary evidence is inconsistent (Cai, 2007). Overseas studies generally begin with the hypothesis that audits are a form of external governance and investigate the influence of agency costs and board of director characteristics on audit pricing. For example, Gul et al. (1998) examine the association between the magnitude of earnings/accruals (as a proxy for agency costs) and audit pricing and find a positive relationship. They also find audit prices to be lower for family companies than other kinds of companies and report the number of independent directors to be negatively related to audit fees. Gul and Tsui (2001) testify to the influence of agency costs on audit pricing in the Australian audit market. Carcello et al. (2002) investigate the association between board of director characteristics and external audit fees using Fortune 1000 data, and find a significant positive relationship between audit fees and board independence, expertise and diligence. Hay et al. (2004) believe that the promulgation of the Sarbanes–Oxley Act, Section 404 of which demands that listed companies disclose internal control information, will increase opportunities to investigate the association between corporate governance and

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[3] Simunic (1980) does not investigate the influence of the Big *N* on audit fees.

audit fees directly, although our review of the overseas literature indicates no such increase. Chinese researchers, in contrast, have paid increased attention to the issue in recent years. Drawing on the ownership perspective, Zhang and Zhang (2005) find the audit fees of state-owned listed companies to be low relative to those of other types of firms and Gao and Gao (2008) report the stockholding ratio of managers to be significantly associated with audit fees. In contrast, Zhang and Xu (2005) show there to be no significant relationship between audit fees and the proportion of state-owned shares. Li and Wang (2006) examine the role played by board of director characteristics and find the audit fee rate to be significantly and negatively related to the number of independent directors on the board, but insignificantly related to the number of board meetings and the existence of an audit committee. Using a framework of internal corporate governance and data on A-share listed companies from 2001 to 2003, Liu and Hu (2006) analyze the relationship between audit pricing and agency costs, and find that a number of the corporate governance factors that may influence agency costs (i.e., the proportion of independent directors on the board, the stockholding ratio of senior managers and president–CEO duality) also have a significant influence on audit fees, subject to the existence of other variables. Cai (2007) investigates the influence of corporate governance structure on audit fees from the perspective of the audit service provider and provides evidence to show that accounting firms charge companies with a larger board of directors higher audit fees than they do non-state-owned companies featuring CEO duality or a moderate managerial share ratio.

The aforementioned research tests the relationship between corporate governance and audit fees empirically from different perspectives, although the theoretical basis of most is substitution theory, with signaling theory receiving little attention to date. Most of this research also considers corporate governance characteristics such as shareholdings, board of director and management variables as proxies for corporate governance (Pan, 2008). As noted in the introduction, there are several limitations to the use of such proxies. To address these limitations, this paper analyzes the relationship between corporate governance and audit fees from the perspectives of substitution theory and signaling theory, and uses inclusion in the SSE Corporate Governance Sector to proxy for corporate governance.

3. Theory and hypotheses

As a form of external governance, independent auditing can mitigate agency conflicts among stakeholders and reduce agency costs (Jensen and Meckling, 1976; Watts and Zimmerman, 1983; Fan and Wong, 2005). Companies with serious agency problems thus have an incentive to hire auditors with a strong reputation to send a signal to the market that they are attempting to reduce agency costs to improve firm value (Wang and Zhou, 2006; Wang, 2009). However, if a company suffers no serious agency problems, it is unnecessary for it to hire high-profile auditors. Analysis from the audit supplier's perspective using the equation, audit risk = material misstatement risk ∗ detection risk, suggests that the greater the material misstatement risk assessed, the greater the likelihood of misstating a financial report, the lower the level of detection risk, the larger the amount of audit work and the higher the audit cost. Carcello et al. (2002) find better internal firm governance to result in less audit risk. Auditors assign a lower level of inherent risk and control risk[4] to companies characterized by such governance. Hence, audit effort and audit costs decline as a result of lower audit fees. In contrast, auditors assess companies with poor internal governance as having higher levels of inherent risk and control risk. For these firms, auditors need to spend more time, perform more audit work and bear greater audit risk, and, accordingly, they collect higher audit fees. This discussion leads to the following hypothesis.

Hypothesis 1a. Audit fees are lower for companies with high-level corporate governance.

At the same time, the information economics perspective suggests the existence of information asymmetry between firms and external investors. Owing to the absence of a mechanism for imparting information, "bad money drives out good" is the prevailing sentiment in the market. Signaling provides the best way to mitigate

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[4] There are two risk-oriented audit approaches, traditional and modern. Inherent risk and control risk in the traditional audit risk approach have been replaced with material misstatement risk in the modern approach.

information asymmetry (Spence, 1973). The two basic methods of conveying a signal in the audit market are to choose reputable information intermediaries voluntarily to assure outside investors of the credibility of accounting information (Fan and Wong, 2005) and to purchase more audit services (Carcello et al., 2002). Both methods result in higher audit costs and fees. It is obvious that the only companies with the incentive to adopt these methods are those with better corporate governance. Such companies prefer the strict test of an external audit to signal their governance level to the market and improve firm value. Therefore, companies with high-level corporate governance may also experience higher audit fees, which leads to the following alternative hypothesis.

Hypothesis 1b. Audit fees are higher for companies with high-level corporate governance.

4. Data and variables

4.1. Data and sample

Considering that the SSE Corporate Governance Sector was introduced in 2007, with its constituents finally confirmed at the end of that year, this study's preliminary sample comprises all A-share companies listed on the SSE for the 2007–2008 period. The following selection procedure was executed. First, in line with similar studies (Liu and Hu, 2006; Cai, 2007), we removed observations of financial enterprises. Second, we removed observations with incomplete data. Third, we removed observations listed on or after November 2, 2007, which is the expiration date for voluntary applications from listed companies, according to the "Appraisal Measures of SSE Corporate Governance Sector."[5] Finally, to alleviate the influence of outliers, we removed all observations whose Tobin's Q value falls outside the range of the mean minus two times the standard deviation and the mean plus two times the standard deviation. The final sample contains 602 observations for 2007 (149 in the SSE Corporate Governance Sector) and 678 for 2008 (184 in the SSE Corporate Governance Sector). Table 1 summarizes the sample selection procedure.

Our primary data source was Beijing University's China Center for Economic Research (CCER) database. Some data, including the components of the SSE Corporate Governance Sector, H-share issuance, number of a company's subsidiaries and the number of industries in which a company operates, were collected manually from the Sina Finance website (www.finance.sina.com.cn), Juchao website (www.cninfo.com.cn) and the annual financial reports of the sample firms.

4.2. Model and variables

We modify and extend the Simunic (1980) model according to the Chinese institutional environment and construct the following multiple linear regression model.

$$Lnfee = \beta_0 + \beta_1 Gov + \beta_2 TobinQ + \beta Big4 + \beta_4 LnAssets + \beta_5 H_S stock + \beta_6 Loss + \beta_7 Recint + \beta_8 Invint$$
$$+ \beta_9 Segment + \beta_{10} Subs\_rt + e. \tag{1}$$

The explained variable in Model 1 is *Lnfee*, which is defined as the natural logarithm of the current year's external audit fees. The explanatory variable is *Gov*, which represents corporate governance. Previous studies have adopted two types of variables to proxy for corporate governance: one or more aspects or characteristics of corporate governance and a variable encompassing the comprehensive aspects of such governance. For example, Larcker and Richardson (2004) use the structure of the board of directors, Carcello et al. (2002) the characteristics of the board of directors and Liu and Hu (2006) the type of final controller, ownership concentration, board independence, CEO duality and managerial shareholdings. All of these proxies are examples of the first type of variable. Studies using proxies of the second type are primarily concerned with the effectiveness of corporate governance, e.g., Beiner et al. (2003) and Drobetz et al. (2004). Pan (2008) is the only study of the relationship between audit fees and corporate governance to use the corporate governance index

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[5] Some observations belong to two or three of the elimination categories. For example, a company listed after November 2, 2007 is also a company with incomplete data.

Table 1
Summary of sample selection criteria.

Selection procedure	2007		2008	
	A-share companies listed on SSE	Companies included in SSE Corporate Governance Sector	A-share companies listed on SSE	Companies included in SSE Corporate Governance Sector
Total	851	199	864	231
Less: financial enterprises	19	10	20	13
Companies with incomplete data	219	40	144	30
Companies listed on or after November 2, 2007	5	–	10	2
Outliers	6	–	12	2
Final sample observations	602	149	678	184

developed by the Nankai University Research Center of Corporate Governance as a proxy for such governance. The current study also adopts a more comprehensive proxy of corporate governance, *Gov*. Different from Pan (2008), however, and for the reasons stated in the introduction, this study uses a dummy variable, i.e., inclusion in the SSE Corporate Governance Sector. *Gov* takes the value of 1 if a company is included in the sector, and otherwise 0. The control variables are as follows.

Previous research shows that firm size is a very important factor influencing audit fees (Simunic, 1980; Wang, 2002; Chen et al., 2005). Theoretically, the larger a company is, the greater its business and accounting activities and hence the greater the audit adjustment needed. In China, the administrative rules and regulations on audit fees issued by the Chinese Institute of Certified Public Accountants or local administrative departments state that accounting firms should charge audit fees that are based on the customer's assets (i.e., firm size). In line with existing analysis and usual practice (e.g., Simunic, 1980; Larcker and Richardson, 2004; Liu et al., 2003), we include *LnAssets* as a variable representing the natural logarithm of total assets at year-end to proxy for firm size. We expect a positive relationship between firm size and audit fees.

The two main measures of firm complexity used in previous research are the number of consolidated subsidiaries (*Subs_rt*) and the number of industries in which a company is involved in (*Segment*). Both are used to measure firm complexity in this study, with a square root transformation to the number of consolidated subsidiaries performed according to the procedure used by Chen and Zhou (2006), Liu and Hu (2006) and Li and Wang (2006). To ensure data comparability, we include only those subsidiaries directly established and held by the sample companies in counting the number of subsidiaries. The number of industries in which a firm is involved in is determined by the types of business (classified by industry) disclosed in its annual financial report. We consider such data to be missing if no corresponding data is disclosed in the annual report, and assign a 1 to *Segment* if only the main business data classified by product is disclosed. Positive relationships are expected between these variables and audit fees.

In line with Simunic (1980) and Larcker and Richardson (2004), we use the ratios of accounts receivable to total assets (*Recint*) and inventory to total assets (*Invint*) at the fiscal year-end to proxy for a company's asset risk. We also use a dummy variable (*Loss*) to indicate whether a company has suffered a loss in the most recent 3 years. This variable takes the value of 1 if a loss occurs, and 0 otherwise. We expect the coefficients of all three variables to be positive.

Some A-share companies are also listed overseas, e.g., on the New York Stock Exchange or Hong Kong Stock Exchange. Because the annual reports of these companies need to be audited by both domestic and overseas auditors, they pay both foreign and domestic audit fees, although many fail to disclose them separately. We thus include a dummy variable (*H_stock*) to control for this factor. We assign it a 1 if the company is listed on the Hong Kong Stock Exchange, and otherwise 0.

Most researchers to date have ignored corporate growth, so whether it is related to audit fees or not remains unknown. We argue here that both audit costs and risk vary with corporate growth, and, accordingly, audit fees also vary with growth. A high growth rate is generally accompanied by an increase in total assets, inventory and/or divisions, which results in greater audit effort and higher audit costs. In addition, a high growth rate also presents a challenge for management, which may struggle to maintain control. There are

Table 2
Definitions of variables in Model 1.

	Name	Definition
Explained variable	Lnfee	Natural logarithm of amount of current year's external audit fee
Explanatory variable	Gov	Dummy = 1 if included in SSE Corporate Governance Sector, otherwise 0
Control variables	LnAssets	Natural logarithm of total assets at the end of the year
	Segment	Number of industries in which a company is involved[a]
	Subs_rt	Square root of number of consolidated subsidiaries[b]
	Recint	Accounts receivable/total assets at the end of the year
	Invint	Inventory/total assets at the end of the year
	Loss	Dummy = 1 if auditee incurred loss in any of past three fiscal years, otherwise 0
	H_Stock	Dummy = 1 if auditee is an H-share company, otherwise 0
	TobinQ	Value of Tobin's Q
	Big4	Dummy = 1 if audited by Big 4 accounting firm, otherwise 0

[a] Collected manually from financial statements.
[b] Collected manually from financial statements.

numerous examples of companies experiencing a sudden decline after years of fast-paced growth (e.g., Sanjiu Medical & Pharmaceutical Co., Ltd., the Giant Group, and the Sanzhu Group). Such cases are often characterized by out-of-control operational and financial management. Hence, a high corporate growth rate may increase audit risk. To reduce such risk, auditors are likely to increase the number of audit tests, resulting in higher audit costs. Although the total assets of companies experiencing negative growth may be on the decline, their incentives to engage in earnings management may strengthen in the face of pressure to report a profit rather than a loss to retain listing status. Such companies may also undergo frequent management changes. Both factors increase the audit risk of companies with negative growth. Companies that enjoy steady, moderate growth, in contrast, are characterized by a lower degree of risk. It is thus possible that the relationship between audit fees and corporate growth may feature a U-shape rather than a linear shape. In the previous literature, Tobin's Q and the price-to-book ratio (P/B) are the variables most commonly used to measure corporate growth (Xiao and You, 2009). In this study, we use Tobin's Q (TobinQ).

The foregoing control variables primarily represent the characteristics of the demand for audit services. However, the characteristics of the audit service supplier are also critical influential factors in audit fee determination, as proved both theoretically and empirically. Francis (1984), Firth (1985), DeFond et al. (2000), Ireland and Lennox (2002) and Chen et al. (2007) find evidence of a Big N premium using stock market data from Australia, New Zealand, Britain, Hong Kong and China, respectively. Using data on 15 countries and districts, Choi et al. (2008) also identify a Big 4 premium after controlling for the litigation environment of the countries/districts under study. In line with previous research, we include Big_4 in our model. We assign it a value of 1 if the accounting firm belongs to the Big 4,[6] and otherwise 0. We expect Big_4 to be positively related to audit fees.

In addition to these control variables, some scholars argue that profit capability, debt level and industry are also important factors influencing audit fees. Accordingly, we include return on assets (ROA) (to represent profit capability), LEVERAGE (a proxy for debt level) and industry variables based on the China Securities Regulatory Commission (CSRC) industry classification (with finance industry observations eliminated and manufacturing used as the benchmark) and run a regression using data for 2007 and 2008. The results show the coefficients of neither ROA nor LEVERAGE to be significant, which is consistent with Zhang and Xu (2005) and Liu et al. (2003). The coefficients for all of the industry variables, with the exception of the real estate industry (which has a significantly negative sign), are insignificant. As these additional control variables add little explanatory power to the model (the adjusted R^2 increases by less than 0.04) and exert little influence on the initial explanatory variables, we do not include them.

Table 2 lists the type, name and definitions of the variables included in Model 1.

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[6] The Big 4 in this study are Ernst & Young Hua Ming, Deloitte Huayong Certified Public Accountants Co., Ltd., PricewaterhouseCoopers Zhongtian and KPMG Huazhen.

Table 3
Descriptive statistics of variables in Model 1 (2007).

Variable	N	Mean	Std. Dev	Median	Min	Max
Continuous variables						
Lnfee	602	13.31661	0.7950948	13.12236	11.91839	18.00517
TobinQ	602	2.036617	1.036366	1.72355	0.5047	7.3216
LnAssets	602	21.71051	1.197106	21.5589	18.49332	27.30113
Recint	602	0.0821234	0.08855	0.0570468	0	0.9750174
Invint	602	0.1689402	0.1492284	0.1353458	0.0001945	0.8766935
Segment	602	2.458472	1.529228	2	1	9
Subs_rt	602	2.759411	1.454904	2.645751	0	11.13553

				Value = 1		Value = 0	
				Freq.	Percentage	Freq.	Percentage
Dummy variables							
Gov	602	0.2475083	0.4319234	149	24.75	453	75.25
H_stock	602	0.0481728	0.2143092	29	4.82	573	95.18
Loss	602	0.2292359	0.4206908	138	23.92	464	76.08
Big4	602	0.0913623	0.288363	55	9.14	547	90.86

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's *Q*.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by a Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.

4.3. Descriptive statistics

Tables 3 and 4 present the results of the descriptive statistics for the 2007 and 2008 observations, respectively. The 2007 sample includes 602 observations, 149 of which (or 24.75% of the total) are included in the SSE Corporate Governance Sector. The 2008 sample includes 678 observations, 184 of which (or 27.14% of the total) are included in this sector. Although the number of observations included in the SSE Corporate Governance Sector in 2008 increased by 35 (or 23.5%) over 2007, the ratio of observations in the sector relative to the total sample is almost the same for the 2 years. There are 35 A- and H-share companies (4.57%) and 51 companies audited by the Big 4 (7.52%) in the 2008 sample, an increase of two and decrease of four, respectively, relative to the 2007 sample. The number of companies suffering a loss in the most recent 3 years reached 162 in 2008, an increase of 24 over 2007, although the proportion remained roughly the same in the 2 years. A minor increase in the mean of the natural logarithm of audit fees can be seen in 2008, although the mean and median are close in that year. The mean of the natural logarithm of total assets is similar. The mean and median of Tobin's *Q* in 2008 are remarkably lower than those in 2007, most likely because of the 2008 international financial crisis. In both years, the Tobin's *Q* mean is much higher than the median. Closer scrutiny of the sample suggests that this result stems from a number of restructured companies with extraordinarily high Tobin's *Q* values, but that also have changes in total assets, inventory and branches after restructuring, thus we do not eliminate these observations. Descriptive statistics also show that the average number of industries in which a company was involved in 2007 was 2.46, with a maximum of 9 and a minimum of 1, and the average number of consolidated subsidiaries in that year was 9.73, with a maximum of 124 and a minimum of 0.[7] The figures for 2008 are almost the same.

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[7] These figures refer to the number of consolidated subsidiaries, whereas the figures in Tables 3 and 4 are the square roots of the number of consolidated subsidiaries.

5. Empirical results

5.1. Univariate analysis

Table 5 presents the results of univariate analysis of the audit fees and firm characteristics of the sample companies and the characteristics of their audit firms. This analysis compares companies included in the SSE Corporate Governance Sector (Governance Sector hereafter) with other firms (Non-governance Sector hereafter). It can be seen from Panel A that the mean difference in audit fees between the two groups of firms is highly significant (*p*-value = 0) in 2007 and 2008, thus providing preliminary evidence that audit fees are correlated with inclusion in the Governance Sector. However, it is possible that the difference is caused by factors other than corporate governance (e.g., the scale of total assets). Panel B presents the means of the firm characteristics of companies in the two groups. We can see that there are significant differences (1% level, two-tailed) between the groups in terms of firm size, listing on the Hong Kong Stock Exchange, loss occurrence and number of subsidiaries in both 2007 and 2008. Furthermore, the difference between the Governance and Non-governance Sectors is positive for all characteristics other than loss occurrence. The results also show that there is no statistically significant difference between the two groups in terms of corporate growth, the ratio of accounts receivable to total assets, the ratio of inventory to total assets and the number of industries in which a firm is involved. Panel C presents the means of the audit firm characteristics, from which it can be seen that the between-group difference is highly statistically significant. We can also see that the proportion of companies audited by one of the Big 4 is larger in the Governance than Non-governance Sector. We believe that these results show that companies audited by a Big 4 audit firm are much more likely to be included in the SSE Corporate Governance Sector. Our inference is as follows. If it is true that the Big 4 provide superior audit quality and can boost the corporate governance level of an auditee, then the results in Panel C show that related parties recognize companies with good corporate governance, although the SSE Corporate Governance Sector is appraised and promulgated on the basis of voluntary applications.

5.2. Multiple regression analysis

5.2.1. Corporate governance and audit fees

We now examine Model 1 using the 2007 and 2008 data. The results are presented in Table 6. The maximum variance inflation factor (VIF) values are 2.06 and 2.11 in 2007 and 2008, respectively, which indicates that multicollinearity is not a serious issue.[8] The adjusted R^2 is 0.7700 in 2007 and 0.7766 in 2008, which indicates that the explanatory power of our model is high and in line with the level achieved in similar research worldwide.[9] The regression results show the coefficient of *Gov* to be −0.0772639 (significant at the 5% level, two-sided) in 2007 and −0.0559151 (significant at the 10% level, one-sided) in 2008. These results confirm the negative influence of corporate governance on audit fees. Further analysis using the 2008 results shows that companies included in the Governance Sector enjoy a RMB64,467[10] (or 5.44%) discount on audit fees over their Non-governance Sector counterparts,[11] thus supporting Hypothesis 1a.

5.2.2. Influence of other factors on audit fees

Our empirical results show firm size to be significantly and positively related to audit fees at the 1% level, which is consistent with the findings of Simunic (1980), Wu (2003), Han and Zhou (2003) and Zhu and Guo (2006). Consistent with Francis (1984) and Wu (2003), the coefficient of *Big_4* is significantly positive. In addition, both *H_stock* and *Loss* are significantly and positively associated with audit fees at the 1% level.

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[8] Multicollinearity is believed not to constitute a serious problem if the VIF value is less than 10. The VIF values in Table 6 are all lower than this critical point, and hence we conclude that there is no serious multicollinearity among the variables in our model.

[9] According to Zhang and Liu (2006), the explanatory power of models in domestic audit fee research is generally low (the highest is 0.49, with most in the range of 0.3–0.4), whereas that of models in similar international research is high (most reach 0.7–0.8).

[10] Based on the sample firms' mean audit fees in 2008, i.e., RMB1,185,059.

[11] The same conclusion can be drawn using the data for 2007. Holding other factors constant, companies included in the Governance Sector enjoy an RMB86,631 (or 7.44%) audit fee discount over their counterparts in the Non-governance Sector (based on the mean audit fees for 2007, i.e., 1,164,405).

Table 4
Descriptive statistics of variables in Model 1 (2008).

Variable	N	Mean	Std. Dev	Median	Min	Max
Continuous variables						
Lnfee	678	13.36693	0.7904243	13.21767	11.51293	18.00517
TobinQ	678	1.26587	0.4261108	1.14915	0.2157	3.2511
LnAssets	678	21.77525	1.246619	21.60967	18.47492	27.346
Recint	678	0.0777098	0.0781033	0.0549182	0	0.5255643
Invint	678	0.1872533	0.189845	0.1420945	$2.02e{-}14$	2.460644
Segment	678	2.570796	1.65401	2	1	10
Subs_rt	678	2.771297	1.504253	2.645751	0	11.61895

				Value = 1		Value = 0	
				Freq.	Percentage	Freq.	Percentage
Dummy variables							
Gov	678	0.2713864	0.4450033	184	27.14	494	72.86
H_stock	678	0.0457227	0.2090373	31	4.57	647	95.43
Loss	678	0.2389381	0.4267497	162	23.89	516	76.11
Big4	678	0.0752212	0.2639427	51	7.52	627	92.48

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.

Further analysis shows the variation in the coefficients of these four variables over the 2 years to be small, which indicates the stability of their relationship with audit fees. We also find a strong relationship between firm complexity and audit fees, with the coefficient of *Subs_rt* statistically and economically significant at the 1% level. However, the regression results on the relationship between *Segment* and *Lnfee* show an inconsistency between 2007 and 2008. The coefficient of *Segment* is insignificant in 2007 and significant at the 1% level in 2008. Empirical results also show the ratios of accounts receivable to total assets and inventory to total assets to be economically and statistically associated with audit fees at a significant level. The coefficient of *Recint* is significant at the 10% level (two-sided) in 2007 and 2008 (one-sided), whereas that of *Invint* is significant at the 10% level (one-sided) in 2007 and at the 5% level (two-sided) in 2008. This evidence is inconsistent with the results of Liu et al. (2003) and Zhu and Guo (2006) and with those of Wu (2003), who reports a significant positive relationship between accounts receivable (and inventory) and audit fees. In our results, the sign of *Invint* is negative. Common sense suggests that the larger a company's inventory, the greater the audit risk and the higher the audit cost. Hence, the relationship between inventory and audit fees should be positive. The cause of the adverse result reported herein is left for future research. One possibility is that the assessed audit risk of inventory is low, thus prompting a simplified audit procedure.

6. Subsample regressions

It is our belief that corporate growth interacts with corporate governance in such a complex manner that it is difficult to identify the relationship between them using common methods, i.e., including an interaction term in the regression equation. Too high or too low a rate of corporate growth will affect firm value and result in an increase in firm risk. Moderate growth, in contrast, is sustainable growth and the governance structure of companies experiencing moderate growth is generally more stable. Accordingly, we divide the sample companies into three subsamples, companies with negative growth, moderate growth and overly fast growth, depending on their Tobin's Q value. If this value is less than 1, we include it in the first group. If it is greater

Table 5
Comparison between governance and non-governance sectors.

	2007						2008					
	Observations		Governance Sector	Non-governance Sector	Difference	*p*-Value	Observations		Governance Sector	Non-governance Sector	Difference	*p*-Value
	Governance Sector	Non-governance Sector					Governance Sector	Non-governance Sector				
Panel A: Comparison of mean of natural logarithm of audit fees												
Lnfee	149	453	13.61134	13.21967	0.3916634	0.000	184	494	13.68533	13.24834	0.4369928	0.000
Panel B: Comparison of mean of auditee characteristics												
TobinQ	149	453	1.99375	2.050717	−0.0569669	0.561	184	494	1.237726	1.276353	−0.0386277	0.294
LnAssets	149	453	22.41935	21.47736	0.9419973	0.000	184	494	22.5234	21.49659	1.026809	0.000
H_stock	149	453	0.1006711	0.0309051	0.0697661	0.001	184	494	0.0923913	0.0283401	0.0640512	0.000
Loss	149	453	0.0402685	0.2913907	−0.2511223	0.000	184	494	0.0326087	0.3157895	−0.2831808	0.000
Recint	149	453	0.0775032	0.0836431	−0.0061399	0.463	184	494	0.0703157	0.0804638	−0.0101482	0.133
Invint	149	453	0.1689522	0.1689362	−0.0000159	0.999	184	494	0.1705773	0.1934646	−0.0228873	0.163
Segment	149	453	2.375839	2.485651	−0.1098123	0.448	184	494	2.51087	2.593117	−0.0822478	0.565
Subs_rt	149	453	3.031421	2.669941	0.3614794	0.008	184	494	3.212619	2.606918	0.6057007	0.000
Panel C: Comparison of mean of auditor characteristics												
Big4	149	453	0.1744966	0.0640177	0.110479	0.000	184	494	0.1467391	0.0981561	0.096844	0.000

Lnfee = natural logarithm of amount of current year's external audit fee.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Table 6
Multiple regression results of corporate governance and audit fees in Model 1. Explained variable: *Lnfee*.

Variable	Expected Sign	2007	VIF	2008	VIF
Intercept	?	5.366365 (12.97)***		5.792809 (14.98)***	–
Gov	?	−0.0772639 (−1.97)**	1.19	−0.0559151 (−1.52)	1.24
TobinQ	?	0.0804095 (4.87)***	1.21	0.1232368 (3.21)***	1.24
LnAssets	+	0.3398957 (18.23)***	2.06	0.3210999 (18.77)***	2.11
H_stock	+	1.250754 (14.21)***	1.47	1.270307 (14.95)***	1.47
Loss	+	0.1324712 (3.31)***	1.17	0.1008036 (2.67)***	1.20
Recint	+	0.3269621 (1.81)*	1.05	0.3221629 (1.64)	1.09
Invint	+	−0.1542988 (−1.45)	1.05	−0.1875702 (−2.40)**	1.02
Big4	+	0.6413022 (9.52)***	1.56	0.6060236 (8.66)***	1.59
Segment	+	0.0132502 (1.24)	1.10	0.0249864 (2.68)***	1.11
Subs_rt	+	0.0883677 (7.49)***	1.22	0.0935901 (8.58)***	1.25
N		602	Average 1.31	678	Average 1.33
F		202.19***		223.48***	
R^2		0.7738		0.7701	
Adj R^2		0.7700		0.7667	

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's *Q*.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.
* Two-tailed significance at the 0.10 level.
** Two-tailed significance at the 0.05 level.
*** Two-tailed significance at the 0.01 level.

than the mean[12] of the total sample, we include it in the third group, and if it is greater than or equal to 1 and less than or equal to the mean of the total sample, we include it in the second group. The descriptive statistics for the three subsamples in 2007 and 2008 are presented in Tables 7 and 8.

To examine the relationship between corporate governance and audit fees in these subsamples, we eliminate the variable *TobinQ* in Model 1 and construct Model 2. The definitions of the variables in Model 2 are the same as those in Model 1.

$$Lnfee = \beta_0 + \beta_1 Gov + \beta_2 Big4 + \beta_3 LnAssets + \beta_4 H\_stock + \beta_5 Loss + \beta_6 Recint + \beta_7 Invint + \beta_8 Segment$$
$$+ \beta_9 Subs\_rt + e. \tag{2}$$

---

[12] The regression results are similar when we use a threshold other than the mean, such as the median.

Tables 9 and 10 present the Model 2 regression results using the subsamples for 2007 and 2008, respectively.[13] The results show a significant negative relationship between corporate governance and audit fees in the moderate growth sample for both 2007 and 2008. The coefficients for both years are near 10%. This relationship is insignificant in the negative growth and overly fast growth subsamples. The sign of *Gov* is inconsistent between the two samples, possibly because corporate governance and corporate growth have opposing effects on audit fees. In other words, audit risk's positive effect on audit fees in negative and overly fast growth firms offsets the negative effect of corporate governance on audit fees to some extent. For this reason, we observe a mixed and insignificant result.

7. Sensitivity test

Because a company's inclusion in the SSE Corporate Governance Sector is the result of a self-selection (voluntary application) process,[14] it is possible that some companies in the Non-governance Sector have good corporate governance, but simply have not submitted an application. If this is the case, the results will be biased. To determine whether our conclusions are robust, we perform a sensitivity test using the two-stage procedure developed by Heckman (1976).

In the first stage, we estimate a Probit choice equation and obtain inverse Mills ratios. In the second stage, we include the inverse Mills ratios as an explanatory variable in the primary model to control for the potential endogeneity induced by self-selection. A number of strict constraints are necessary in implementing the Heckman (1976) procedure successfully. For example, at least one exogenous independent variable that has no direct effect on the dependent variable in the second-stage regression should be included in the first-stage choice model. Lennox et al. (2012) find that many accounting studies fail to select proper variables when using selection models and thus obtain inconsistent results.[15] Hence, we carefully select the explanatory variables in the first stage and include 11 factors considered to have an effect on corporate governance, such as *Auditcomm* (establishment of an audit committee), *Dual* (CEO duality), *DirScale* (board of director scale), *Fnctl* (final controller type) and *M_Stockholder* (frequency of stockholder meetings) in the choice model. Of these factors, at least *Fnctl* and *M_Stockholder* have no significant effect on audit fees[16] and can thus play the role of an exogenous independent variable excluded in the second-stage regression. The first-stage choice equation is as follows (Model 3).

$$
\begin{aligned}
Probit(Gov = 1) \\
= \beta_0 + \beta_1 Auditcomm + \beta_2 Dual + \beta_3 First + \beta_4 Second + \beta_5 Auditopinion + \beta_6 M\_Dir \\
+ \beta_7 M\_Supervisor + \beta_8 M\_Stockholder + \beta_9 DirScale + \beta_10 IndDir \beta_{11} Fnctl + \beta_{12} TobinQ \\
+ \beta_{13} Big4 + \beta_{14} LnAssets + \beta_{15} H\_stock + \beta_{16} Loss + \beta_{17} Recint + \beta_{18} nvint + \beta_{19} Segment \\
+ \beta_{20} Subs\_rt + e.
\end{aligned}
\tag{3}
$$

[13] We also use the P/B ratio as a criterion to regress Model 2. The results are consistent with those reported.

[14] The Expert Consultative Committee for Corporate Governance Sector Appraisal was officially founded in September 2007. In the same month, the "Appraisal Measures of the SSE Corporate Governance Sector (Draft Version)" was published to solicit the opinions of all parties. The "Appraisal Measures of the SSE Corporate Governance Sector" were officially released on October 9, after which listed companies could voluntarily submit applications. By November 2, 2007, the SSE had received valid application materials from 255 companies, published these materials and solicited public comment. Then, on the basis of the appraisal results of the Expert Consultative Committee, the final Sector list included 199 companies.

[15] Lennox et al. (2012) report the results of selection models to be sensitive to model shape and note that an absence of exclusion restrictions can lead to severe multicollinearity problems.

[16] Few researchers report the type of final controller or frequency of stockholder meetings to have a significant influence on audit fees. We obtain results that are consistent with previous research using data for 2006, 2007 and 2008.

Table 7
Descriptive statistics of variables in subsample (2007).

Variable	Negative growth (N = 20)					Moderate growth (N = 372)					Overly fast growth (N = 210)				
	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max
Continuous variables															
Lnfee	13.72293	1.023866	13.49333	12.42922	15.95558	13.37225	0.875986	13.21767	11.91839	18.00517	13.17936	0.565867	13.12236	11.91839	15.75137
LnAssets	22.74855	1.175557	22.72143	20.73494	24.98712	21.96001	1.181509	21.71716	19.91666	27.30113	21.16967	1.004719	21.11371	18.49332	24.15856
Recint	0.047737	0.061352	0.021253	0.000511	0.213918	0.082786	0.091054	0.060145	0	0.975017	0.084225	0.085850	0.053721	0.000025	0.480798
Invint	0.141426	0.139168	0.118763	0.002116	0.528862	0.173637	0.151263	0.139192	0.000195	0.876694	0.163240	0.146684	0.128984	0.000937	0.812561
Segment	1.9	1.165287	1.5	1	5	2.424731	1.469265	2	1	9	2.571429	1.650618	2	1	8
Subs_rt	2.654131	1.300035	2.645751	0	5.91608	2.797157	1.448523	2.64575	0	9.539392	2.702572	1.483857	2.44949	0	11.13553
			Value = 1	Value = 0				Value = 1	Value = 0				Value = 1	Value = 0	
	Mean	Std. Dev	Freq.	Percentage	Feeq.	Percentage	Mean	Std. Dev	Freq.	Percentage	Feeq.	Percentage	Mean	Std. Dev	Freq.	Percentage	Freq.	Percentage
Dummy variables																
Gov	0.15	0.366348	0	3	15	17	85	0.266129	0.442528	0	99	27	273	73	0.223810	0.417792	0	47	22	163	78
H_stock	0.25	0.444262	0	5	25	15	75	0.053763	0.225854	0	20	5	352	95	0.019048	0.137019	0	4	2	206	98
Loss	0.2	0.410391	0	4	20	16	80	0.193548	0.395611	0	72	19	300	81	0.295238	0.457240	0	62	30	148	70
Big4	0.25	0.444262	0	5	25	15	75	0.104839	0.306758	0	39	10	333	90	0.052381	0.223326	0	11	5	199	95

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.

Table 8
Descriptive statistics of variables in subsample (2008).

Continuous variables

Variable	Negative Growth ($N = 157$)					Moderate Growth ($N = 274$)					Overly Fast Growth ($N = 247$)				
	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max
Lnfee	13.75278	1.102427	13.45884	12.25486	18.00517	13.32945	0.682444	13.21767	12.20607	16.70588	13.16326	0.541855	13.12236	11.51293	15.73243
LnAssets	22.45753	1.382253	22.13158	19.87016	27.346	21.9469	1.109534	21.7087	18.73775	25.14214	21.15117	0.989002	21.10941	18.47492	24.85722
Recint	0.059195	0.060625	0.039716	0	.3320666	0.077571	0.080662	.0585952	0	0.525564	0.089632	0.082916	0.067365	0	0.399786
Invint	0.168962	0.166717	0.126629	2.02e−14	.7681355	0.199915	0.191007	.1442456	3.36e−14	0.940148	0.184833	0.201679	0.147006	7.73e−14	2.460644
Segment	2.624204	1.718728	2	1	10	2.49635	1.635791	2	1	9	2.619433	1.635762	2	1	8
Subs_rt	2.829213	1.532347	2.645751	0	9.69536	2.858444	1.576183	2.645751	0	9.486833	2.637812	1.397386	2.44949	0	11.61895

Dummy variables

Variable	Mean	Std. Dev		Value = 1		Value = 0		Mean	Std. Dev		Value = 1		Value = 0		Mean	Std. Dev		Value = 1		Value = 0	
				Freq.	Percentage	Freq.	Percentage				Freq.	Percentage	Freq.	Percentage				Freq.	Percentage	Freq.	Percentage
Gov	0.286624	0.453631	0	45	29	112	71	0.277372	0.448521	0	76	28	198	72	0.226721	0.419561	0	56	23	191	77
H_stock	0.165605	0.372915	0	26	17	131	83	0.018248	0.134093	0	5	2	269	98	0	0	0	0	0	247	100
Loss	0.152866	0.361010	0	24	15	133	85	0.229927	0.421556	0	63	23	211	77	0.303644	0.460764	0	75	30	172	70
Big4	0.165605	0.372915	0	26	17	131	98	0.065693	0.248199	0	18	7	256	93	0.028340	0.166280	0	7	3	240	97

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's *Q*.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.

Table 9
Multiple regression results of corporate governance and audit fees in Model 2 (2007). Explained variable: *Lnfee*.

Variable	Expected sign	Negative growth	VIF	Moderate growth	VIF	Overly fast growth	VIF
Intercept	?	2.138893 (0.37)	–	4.86583 (9.86)***	–	7.902495 (12.34)***	–
Gov	?	0.1673906 (0.41)	1.92	−0.0980085 (−1.98)**	1.19	−0.0383723 (−0.61)	1.21
LnAssets	+	0.4615434 (1.83)*	7.48	0.3709851 (16.20)***	1.82	0.2307721 (7.55)***	1.65
H_stock	+	1.45432 (3.78)***	2.49	1.36174 (12.76)***	1.45	0.9150677 (4.81)***	1.19
Loss	+	0.572797 (1.27)	2.92	0.150768 (2.80)***	1.13	0.033121 (0.56)	1.26
Recint	+	1.33218 (0.45)	2.86	0.2718718 (1.19)	1.07	0.1819705 (0.63)	1.06
Invint	+	1.362542 (1.36)	1.66	−0.2010797 (−1.48)	1.06	−0.2201791 (−1.32)	1.04
Big4	+	dropped	–	0.6569943 (7.97)***	1.60	0.539355 (4.64)***	1.18
Segment	+	0.1629168 (1.28)	1.86	−0.0144943 (−1.00)	1.12	0.0198448 (1.29)	1.13
Subs_rt	+	0.0058437 (0.05)	1.83	0.0936485 (6.20)***	1.19	0.1162623 (5.98)***	1.45
N	Total 602	20	Average 2.88	372	Average 1.29	210	Average 1.24
F		9.80***		172.33***		39.91***	
R^2		0.8770		0.8108		0.6424	
Adj R^2		0.7875		0.8061		0.6263	

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.
* Two-tailed significance at the 0.10 level.
** Two-tailed significance at the 0.05 level.
*** Two-tailed significance at the 0.01 level.

The definitions of the variables in Model 3 can be found in Table 11. It should be noted that because the SSE Corporate Governance Sector was launched in 2007, the data used in the choice equation is for 2006. We obtain 725 sample observations[17] and the regression results are presented in Table 12.

The second step is to include the inverse Mills ratios (*Lambda*) in Model 1 and construct Model 4. The regression results are reported in Table 13.

$$Lnfee = \beta_0 + \beta_1 Gov + \beta_2 TobinQ + \beta_3 Big4 + \beta_4 nAssets + \beta_5 H\_Stock + \beta_6 Loss + \beta_7 Recint + \beta_8 Invint$$
$$+ \beta_9 Segment + \beta_{10} Subs\_rt + \beta_{11} Lambda + e. \tag{4}$$

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[17] A total of 835 companies were listed on the SSE in 2006. According to the "Appraisal Measures of the SSE Corporate Governance Sector," necessary conditions for inclusion in the SSE Corporate Governance Sector are having been listed on the SSE for 12 months and no special treatment status. Hence, we eliminate 74 sample observations marked ST or *ST and 5 sample observations listed after October 9, 2006. In addition, we also eliminate 15 sample companies in the finance industry and 16 with incomplete data. The final sample thus includes 725 observations.

Table 10
Multiple regression results of corporate governance and audit fees in Model 2 (2008). Explained variable: *Lnfee*.

Variable	Expected sign	Negative growth	VIF	Moderate growth	VIF	Overly fast growth	VIF
Intercept	?	4.15681	–	5.789669	–	6.978095	–
		(4.85)***		(11.11)***		(11.22)***	
Gov	?	−0.1201422	1.29	−0.1018529	1.21	0.036208	1.26
		(−1.41)		(−1.98)**		(0.59)	
LnAssets	+	0.3973288	2.30	0.3294044	1.60	0.2736142	1.61
		(10.21)***		(13.75)***		(9.22)***	
H_stock	+	1.321769	1.85	1.2595	1.22	Dropped	–
		(10.21)***		(7.28)***			
Loss	+	0.1286156	1.14	0.0343346	1.18	0.1343597	1.33
		(1.22)		(0.64)		(2.33)**	
Recint	+	2.2625	1.22	0.063834	1.11	0.05694	1.01
		(3.51)***		(0.23)		(0.20)	
Invint	+	−0.3300925	1.07	−0.2394448	1.05	−0.0421028	1.01
		(−1.50)		(−2.13)**		(−0.36)	
Big4	+	0.3631917	2.04	0.650547	1.35	0.8505657	1.15
		(2.67)***		(6.62)***		(5.71)***	
Segment	+	0.0408373	1.13	0.0125083	1.13	0.0318546	1.12
		(1.86)*		(0.92)		(2.13)**	
Subs_rt	+	0.0808408	1.24	0.0968029	1.33	0.0925125	1.30
		(3.14)***		(6.31)***		(4.90)***	
N	Total 678	157	Average 1.48	274	Average 1.24	247	Average 1.23
F		91.00***		87.99***		38.95***	
R^2		0.8478		0.7500		0.5670	
Adj R^2		0.8385		0.7415		0.5524	

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries a company involved in.
Subs_rt = square root of number of consolidated subsidiaries.
* Two-tailed significance at the 0.10 level.
** Two-tailed significance at the 0.05 level.
*** Two-tailed significance at the 0.01 level.

As can be seen from Table 13, the coefficient and sign of *Gov* are larger than and consistent with the benchmark results, respectively. The coefficient in 2008 is approximately 70% greater than that of the benchmark. Although *Gov*'s significance level declines slightly in 2007, it remains significant at the 10% level (two-sided). Its significance level in 2008 reaches the 5% level (two-sided). The coefficients of most of the control variables vary within 10%, with the exception of those of *Recint* and *Invint*. The significance level of the control variables is the same in the 2 years, except for *Recint* in 2007 (which changes from significant at the 10% level to insignificant) and *Segment* in 2008 (from the 1% level to the 5% level). The *t*-statistics for *Lambda* are 0.51 and 1.28 in 2007 and 2008, respectively. The maximum VIF value is 2.44, which indicates that the model suffers no serious multicollinearity problems. Thus, the sensitivity test results demonstrate that our findings are robust to self-selection.

8. Conclusions and limitations

This paper reports the results of an empirical investigation of the relationship between corporate governance and audit fees using data disclosed in the annual financial reports of companies listed on the Shanghai

Table 11
Definitions of variables in Model 3.

	Name	Definition
Explained variable	Gov	Dummy = 1 if included in SSE Corporate Governance Sector, otherwise 0
Explanatory variables	Auditcomm	Dummy = 1 if audit committee is set up, otherwise 0
	Dual	Dummy = 1 if president and CEO are the same person, otherwise 0
	First	Shares held by first major shareholder/total shares at year-end
	Second	Shares held by second major shareholder/total shares at year-end
	Auditopinion	Numerical variable: 1 if a clean opinion, 2 if an unqualified opinion with emphasis of matter paragraph, 3 if a qualified opinion, 4 if a disclaimer of opinion
	M_Dir	Frequency of board of director meetings held in a fiscal year
	M_Supervisor	Frequency of board of supervisor meetings held in a fiscal year
	M_Stockholder	Frequency of stockholder meetings held in a fiscal year
	DirScale	Number of members of board of directors disclosed in annual report
	IndDir	Number of independent directors on the board of directors disclosed in annual report
	Fnctl	Dummy = 1 if owned by the state, otherwise 0
	TobinQ	Value of Tobin's Q
	Big4	Dummy = 1 if audited by Big 4 accounting firm, otherwise 0
	LnAssets	Natural logarithm of total assets at the end of the year
	H_Stock	Dummy = 1 if auditee is an H-share company, otherwise 0
	Loss	Dummy = 1 if auditee incurred a loss in any of the past three fiscal years, otherwise 0
	Recint	Accounts receivable/total assets at the end of the year
	Invint	Inventory/total assets at the end of the year
	Segment	Number of industries in which a company is involved
	Subs_rt	Square root of number of consolidated subsidiaries

Table 12
Probit regression results. Explained variable: Gov.

Variable	Auditcomm	Dual	First	Second	Auditopinion	M_Dir	M_Supervisor	M_Stockholder
Result	0.1164814	0.270078	0.5186868	−0.025993	−0.506515	−0.013953	0.0543591	−0.012199
	(1.04)	(1.40)	(1.25)	(0.03)	(−1.95)**	(−0.75)	(1.48)	(−0.25)
Variable	DirScale	IndDir	Fnctl	TobinQ	Big4	LnAssets	H_Stock	Loss
Result	0.0181251	0.1075773	0.0592087	0.3857623	0.1731616	0.2789833	0.3502073	−1.072429
	(0.49)	(1.41)	(0.44)	(2.55)**	(0.73)	(3.95)***	(0.84)	(−4.93)***
Variable	Recint	Invint	Segment	Subs_rt	Intercept	N	LR chi2	Pseudo R^2
Result	−0.536	−0.085569	−0.114073	0.040388	−7.272783	725	109.26***	0.1696
	(−0.96)	(−0.31)	(−2.76)***	(1.05)	(−4.85)***			

Figures in parentheses are Z-values.
* Two-tailed significance at the 0.10 level.
** Two-tailed significance at the 0.05 level.
*** Two-tailed significance at the 0.01 level.

Stock Exchange in the first and second years after the introduction of the SSE Corporate Governance Sector, i.e., 2007 and 2008. The results based on the full sample show this relationship to be significant and negative. In general, the audit fees of companies included in this sector are 5.44–7.44%[18] lower than those of their Non-governance Sector counterparts. These results suggest that substitution theory provides a better explanation of the relationship between corporate governance and audit fees than signaling theory. Subsample data also shows corporate governance's influence on audit fees is affected by corporate growth. The negative relation-

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[18] The percentages are 5.44% in 2008 and 7.44% in 2007.

Table 13
Regression results of Model 4. Explained variable: Lnfee.

| | 2007 | | | 2008 | | |
	Benchmark	Two-stage regression	VIF	Benchmark	Two-stage regression	VIF
Intercept	5.366365	5.684087	–	5.792809	6.164501	–
	(12.97)***	(13.88)***		(14.98)***	(16.05)***	
Gov	−0.0772639	−0.0903212	2.19	−0.0559151	−0.0930575	2.00
	(−1.97)**	(−1.72)*		(−1.52)	(−2.01)**	
TobinQ	0.0804095	0.073934	1.22	0.1232368	0.1145037	1.25
	(4.87)***	(4.58)***		(3.21)***	(2.98)***	
LnAssets	0.3398957	0.3246977	1.98	0.3210999	0.3032975	2.05
	(18.23)***	(17.55)***		(18.77)***	(17.79)***	
H_stock	1.250754	1.124668	1.40	1.270307	1.094173	1.42
	(14.21)***	(12.51)***		(14.95)***	(12.32)***	
Loss	0.1324712	0.141715	1.32	0.1008036	0.1104056	1.28
	(3.31)***	(3.41)***		(2.67)***	(2.89)***	
Recint	0.3269621	0.2719119	1.06	0.3221629	0.2791031	1.09
	(1.81)*	(1.54)		(1.64)	(1.45)	
Invint	−0.1542988	−0.1257606	1.04	−0.1875702	−0.1685315	1.02
	(−1.45)	(−1.19)		(−2.40)**	(−2.18)**	
Big4	0.6413022	0.6755913	1.51	0.6060236	0.6677469	1.58
	(9.52)***	(10.15)***		(8.66)***	(9.43)***	
Segment	0.0132502	0.0100982	1.10	0.0249864	0.022193	1.11
	(1.24)	(0.96)		(2.68)***	(2.40)**	
Subs_rt	0.0883677	0.0935087	1.22	0.0935901	0.0961795	1.27
	(7.49)***	(8.03)***		(8.58)***	(8.79)***	
Lambda		0.085819	2.44		0.0626612	2.09
		(0.51)			(1.28)	
N	602	592	Average 1.50	678	662	Average 1.47
F	202.19***	159.50***		223.48***	171.28***	
R^2	0.7738	0.7516		0.7701	0.7435	
Adj R^2	0.7700	0.7468		0.7667	0.7392	

Lnfee = natural logarithm of amount of current year's external audit fee.
Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.
TobinQ = value of Tobin's Q.
LnAssets = natural logarithm of total assets at the end of the year.
H_stock = 1 if auditee is an H-share company, and 0 otherwise.
Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.
Recint = accounts receivable/total assets at the end of the year.
Invint = inventory/total assets at the end of the year.
Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.
Segment = number of industries in which a company is involved.
Subs_rt = square root of number of consolidated subsidiaries.
Lambda = inverse Mills ratio.
Note: The difference in the number of observations between the two-stage regression (Model 4) and basic regression (Model 1) for 2007 is due to the observations in the latter including companies listed after 2006. The procedure used to calculate *Lambda* means the *Lambda* values for these observations are missing, which is why the difference occurs in 2008.
* Two-tailed significance at the 0.10 level.
** Two-tailed significance at the 0.05 level.
*** Two-tailed significance at the 0.01 level.

ship between corporate governance and audit fees is found to be economically and statistically significant in sample firms that experienced moderate growth during the sample period, relative to those that experienced overly fast or negative growth, for which the relationship is mixed and insignificant.

The SSE Corporate Governance Sector was introduced near the end of 2007. Although we find corporate governance to have an economically significant influence on audit fees, the degree of statistical significance is relatively low (10% level, one-sided in the full-sample regression for 2008). There are two main explanations

for this finding in addition to the effect of corporate growth. First, audit fees are characterized by inertia. When audit firms initially negotiate their fees with clients prior to provision of the first audit service, they perform a comprehensive evaluation of the company, determine the audit risk level, estimate the audit costs and finally determine the charging criteria. Although regulations require audit firms to perform such routine work as evaluating the audit risk level and determining the audit procedure and test scope every year, in practice they may keep audit fees fixed for many years, thus demonstrating inertia. Of the 536 sample companies in 2008 that exhibited comparability[19] to those in 2007, 283 companies (or 48.29%) saw no change in audit fees. Second, it takes time for stakeholders to comprehend the signal conveyed by corporate governance. As noted in the introduction to this paper, there are two competing explanations concerning the relationship between corporate governance and audit fees, one informed by substitution theory and the other by signaling theory. If listed companies are rational economic beings, then they will prefer substitution theory to signaling theory, as its logic suggests that audit fees will decrease and firm value increase. Acceptance of signaling theory is more complicated. Signaling high-level corporate governance through a high-quality audit requires a large expenditure on auditing. Hence, a company's acceptance of signaling theory depends on the tradeoff between expenditure and the expected return.[20] The situation is the opposite for audit firms. They tend to prefer signaling theory, as it allows them to charge higher fees with no increase in audit risk, whereas the logic of substitution theory requires that they balance a decrease in fees and an increase in audit risk with a reduction in the number of audit tests. Both auditees and auditors clearly need time to consider the economic consequences of signaling good corporate governance and adopt audit plans that favor themselves when negotiating audit fees. Reaching consensus may take a considerable amount of time. Our empirical evidence is largely in accord with the first explanation, i.e., that audit fees are characterized by inertia, although its validity requires testing with data for and beyond 2009.

This study suffers two limitations. The first lies in the sample data. Because audit fees may be calculated in a variety of ways (e.g., they may or may not be inclusive of travel expenses and the fees for interim reports), we cannot infer whether the data on companies that do not disclose detailed audit fees are consistent with those of other companies. The second limitation lies in self-selection. Although we perform a sensitivity test using the two-stage procedure developed by Heckman (1976), we cannot completely rule out the influence of self-selection owing to the complexity of dealing with such a problem.

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[19] Here, comparability refers to the company disclosing its audit fees in both its 2007 and 2008 annual reports.
[20] The return may be an increase in firm value owing to an improvement in corporate governance. As consideration of this issue is not the main research objective of the study, we provide no evidence of the relationship between corporate governance and firm value.

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